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AN EXPLORATORY STUDY ON FOOD SAFETY IN MALAYSIA: THE GOVERNANCE OF ONLINE HOMEMADE FOOD PRODUCERS

SITI HUSMILA BINTI HUSSIN

PhD **OCTOBER 2026**

Abstract

The expansion of online homemade food businesses in Malaysia has transformed the food landscape by enabling household-based entrepreneurship, while simultaneously raising complex food safety and governance challenges. These home-based food businesses often operate informally and outside established regulatory systems, creating vulnerabilities related to business registration, traceability, and adherence to food safety standards. This research investigates how food safety is governed within Malaysia's online homemade food sector, with a particular focus on existing practices, regulatory gaps, and potential pathways for effective and inclusive governance. Adopting a mixed-methods research design, the study combines a quantitative survey of online homemade food producers with qualitative data from semi-structured interviews with food technologists as well as focus group discussions involving key stakeholders. Quantitative findings reveal uneven levels of food safety knowledge, reliance on informal documentation, and limited engagement with formal registration and traceability systems. Qualitative analysis further identifies challenges faced by regulators in monitoring home-based food production, limitations of traditional enforcement approaches, and the growing influence of digital platforms and vendors in shaping compliance behaviours. Guided by food safety culture and governance perspectives, the study argues that conventional regulatory models are insufficient for managing digitally mediated informal food systems. Instead, it highlights the need for adaptive and supportive governance approaches that integrate education-first enforcement, risk-based oversight, digital traceability tools, and strategic partnerships with online platforms and community networks. This research proposes a context-specific governance framework designed to strengthen food safety while recognising the operational realities of home-based food producers. By extending food safety governance discourse to informal and digital food environments, this research offers practical and policy-relevant contributions to improving consumer protection and supporting sustainable growth within Malaysia's online homemade food sector.

Keywords: online homemade food business, food safety governance, home-based food production, food safety culture, informal food sector, digital food platforms, Malaysia

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List of Abbreviation

ANOVA	Analysis of Variance
FSC	Food Safety Culture
FSMS	Food Safety Management Systems
GFSI	Global Food Safety Initiative
GMP	Good Manufacturing Practice
GHP	Good Hygienic Practice
HACCP	Hazard Analysis Critical Control Point
ISO	International Organization for Standardization
SME(s)	Small And Medium Sized Enterprise(S)
SOP	Standard Operating Procedure
WHO	World Health Organisation
KMO	Kaiser-Meyer-Olkin
SPSS	Statistical Package for Social Sciences
MSA	Measure of Sampling Adequacy
MoHM	Ministry of Health
MOH	Ministry of Health
FGD	Focus Group Discussion
PCA	Principal Component Analysis

CHAPTER ONE
INTRODUCTION

1.1 Chapter Structure and Content

This chapter focuses on food safety aspects, concentrating on its governance in Malaysia among homemade food producers. It commences with a background of the research which revolves around the crucial roles of homemade food businesses towards Malaysian economic, adherence towards food safety standards and guidelines are exemplified. Following that, the problem statement of the research is described in detail. Then, the aims of the study and research questions, research objectives, significance of the study, contribution to knowledge and basis for originality of the PhD, the scope of the study and the organisation of the thesis are also presented in this section accordingly.

1.2 Background of the Study

In recent years, there has been a significant emergence of independent businesses, particularly home industries. A home industry is defined as a product-based enterprise, typically managed by family members, and is generally categorised as a small business. Home industries are similar to, but distinct from, homemade businesses. While home industries may scale up into larger operations, homemade businesses often remain small and tend to focus on hand-crafted products, such as artisanal food items. (Anggoro et al., 2019; Master & Abraham, 2021). Conversely, micro, small and medium-sized businesses face the risk of closure, for example due to consequences of events such as the prolonged lockdown during the COVID 19 pandemic (Anand, 2021). Nevertheless, the food and

beverage sector is anticipated to be the sole area of economic growth (Poinski, 2020; Ibrahim & Mansor, 2022). It is in this context that the focus of this research is on homemade food business producers in Malaysia, given their crucial role in the Malaysian economy.

So, how is homemade food business important for the Malaysian economic? The food sector stands as one of the largest contributors to the Malaysian economy, serving as a primary source of income for local communities. It is integral to the overall development of the national economy, facilitating profit distribution and employment creation (Rahman et al., 2011). Thus, the homemade sector is a vital component of Malaysia's economic landscape, contributing significantly to the nation's revenue. In 2023, the food industry, encompassing both large-scale operations and smaller as well as home-based businesses, generated revenue of RM228.66 billion, with a compound annual growth rate (CAGR) of 7.95% expected from 2023 to 2027 (Department of Statistics, 2024). This substantial economic contribution underscores the sector's importance in driving growth and stability within the Malaysian economy. Moreover, homemade food businesses are particularly crucial in creating employment opportunities, especially for women and individuals in rural areas. The report Economic Census 2023 for Food and Beverage Services Sector from the Department of Statistics Malaysia, Ministry of Economy (2023) stated that the food and beverage services sector employed approximately 1,079,843 people in 2022, with this including a significant number of workers in homemade food businesses. The rise of home-based food enterprises has provided a viable source of income for many Malaysians, particularly in the wake of job losses due to the COVID-19 pandemic (Foodiepedia, 2022). By offering flexible work options and fostering community-based economic activities,

these businesses play a pivotal role in reducing unemployment and supporting local economies.

On top of that, homemade food businesses play a vital role in enhancing food security and alleviating hunger by ensuring that nutritious and affordable food options are readily available to all segments of the population, particularly low-income families (Mills et al., 2017; Steenkamp, Cilliers, Cilliers & Lategan, 2021; The Supply Chain Report, 2024). These businesses often source their ingredients from local families and suppliers, thereby supporting the local agricultural economy and fostering a more resilient food supply chain (Stein & Santini, 2022). This local sourcing not only reduces the dependency on imported goods, which can be subjected to price volatility and supply disruptions, but also ensures that the food is fresh and culturally relevant (Zeng, Xu & Xie, 2023). For instance, a homemade food business in Malaysia might source fresh vegetables, rice and spices from nearby farms, ensuring that traditional dishes such as nasi lemak and laksa are both affordable and accessible to the community. By doing so, these businesses help to mitigate the risk of hunger, as they provide a steady supply of essential nutrients at a lower cost (Sporchia et al., 2024). Moreover, the presence of homemade food businesses in local markets and online platforms increases the availability of diverse food options, making it easier for families to maintain a balanced diet (Arigbede, Kilanko, Arigbede & Matthew, 2023). This is particularly important in urban areas where access to fresh, affordable food can be limited (Vilar-Compte, 2021). In essence, although the food sector including homemade food businesses is knowingly complex, it is crucial to ensure the well-being of the population, particularly in respect of alleviating the risk of hunger (Rahman, Ahmad, Mohamad & Ismail, 2011), and also to act as a crucial buffer against food insecurity,

promoting both economic stability and public health by ensuring that everyone has access to the food they need to thrive.

Furthermore, the advent of e-commerce platforms has markedly enhanced the growth of homemade food businesses by providing a marketplace for home-cooked meals and reducing entry barriers for aspiring entrepreneurs. In Malaysia, these businesses typically leverage social media platforms such as GrabFood, Foodpanda and ShopeeFood alongside word-of-mouth marketing, participation in local markets and events, influencer collaborations and engagement in online communities. Monawara Hakim Ali, President of the Chattogram Women Chamber of Commerce and Industries observed that although many businesses have suffered significant losses due to the pandemic, female food producers have increasingly utilised contemporary technology trends such as Facebook and Instagram to engage in the homemade food sector. In accordance with that, effective guidance and implementation of home-based food businesses particularly among women entrepreneurs can help maintain their competitiveness despite the challenges posed by significant events like COVID-19 (The Business Standard, 2020). These strategies not only facilitate business growth and innovation but also enable homemade food businesses to reach a broader audience and thereby make a more substantial contribution to the Malaysian economy.

Despite being a significant driver of the country's economic growth, the food producers bear the crucial responsibility of ensuring that food products are produced safely for consumption. This necessitates strict adherence to the safety standards and guidelines established by the Ministry of Health, Malaysia (MoHM) (MoHM, 2024). Consequently, providing information on safe food handling guidelines is expected to aid food producers,

particularly those involved in homemade food production in their preparation and handling processes. The importance of these guidelines cannot be overstated as they are designed to protect public health by minimising the risk of foodborne illnesses. A 2019 report by the Ministry of Health revealed that 21% of food poisoning incidents in Malaysia were attributed to food trucks, restaurants, and night markets, excluding those occurring in schools, institutions, private homes (Hanafi, Toolib, Zulkifle & Daud, 2021). As such, this clearly demonstrates that the responsibility for ensuring the safe production of food does not rest solely with online homemade food producers. The Food Safety and Quality Division (FSQD) under the Ministry of Health also bears the significant challenge and responsibility of conducting official controls over homemade food businesses to ensure compliance with established guidelines. Hence, conducting and implementing research which addresses food safety governance among these food producers can be deemed necessary.

1.3 Problem Statement

Homemade food plays a vital role in economic growth and development, especially with the participation of small-scale producers in rural and urban areas (Bravo, Rubio & Spiller, 2014; Grebitus, 2021). In fact, rapid changes in food consumption and modern buying trends among consumers have led to the expansion of homemade food products (FAO, 2024; Warde, Martens & Chaney, 2001; Bäckström, Pirttilä-Backman & Tuorila, 2003). This is evident based on the utilisation growth of online ordering platforms and delivery services, especially among consumers with a tight daily schedule and an urban lifestyle, as well as the shifting of eating habits in congested cities (Cuneo, 1998; Madran, 1999;

Tiernan, 2015; Sezgin & Şanlıer; 2016; Bell & Fernandes, 2017). As a result, there is now a fast-growing market of online homemade food producers racing to meet the demands of online consumers. Despite business growth, homemade food producers continue to face pressing and complex challenges, particularly the tension between prioritising profitability and ensuring consumer food safety. Hence, this study explores how to govern food safety among online homemade food producers in Malaysia.

On that note, there is also a need to identify who bears the responsibility in regard to the safety of homemade food products if and when things go wrong. On the most part, it is mainly due to the failure to control, or an inability to provide surveillance on, the producers as well as the non-existence of a standard monitoring certificate of food safety from the governing bodies of this food category (Bravo, Rubio & Spiller, 2014). In addition, homemade food products are regarded as artisanal food as they are usually made at home or locally using traditional methods, without food additives, and require a high volume of manual work (Barjolle & Chappius, 2000; Canadian Food Inspection Agency, 2011; FSA, 2008; Domınguez-Lopez et al., 2011; Padilla et al., 2007). Consequently, homemade foods are exposed to risks and danger, especially with the absence of food safety standards and operating procedures (SOPs) as regulated by the Food Safety and Quality Division, Ministry of Health Malaysia.

The failure to prepare, provide and deliver safe food as a consequence of the unhygienic practices applied during food processing and handling are the main reasons for increasing foodborne disease (FBD) outbreaks as a result of food contamination (Howes, McEwan, Griffiths & Harris, 1996; Todd, Greig, Bartleson & Michaels, 2007; Ruby, Abidin, Lihan, Jambari & Radu, 2019). In Malaysia, between 2015 and 2016, case incidences and

mortality rates from cholera, dysentery, hepatitis A and typhoid decreased, and yet, in that same year, the country recorded an increment of 7.87 food poisoning incidences and mortality rates which accounted for 0.01 per 100,000 population (Ministry of Health Malaysia (MoHM), 2016, 2017). In 2022, Malaysia documented approximately 14,293 cases of food poisoning. According to the incidence and mortality rates of communicable diseases for that year, the incidence rate of food poisoning was 43.77 per 100,000 population while the mortality rate was 0.01 per 100,000 population as demonstrated in the figure below.



Incidence Rate and Mortality Rate of Communicable Diseases, 2022
(per 100,000 population)

Communicable Diseases	Incidence Rate	Mortality Rate
Food and Water Borne Diseases		
Cholera	0.02	0
Dysentery	0.78	0
Food Poisoning	43.77	0.01
Typhoid And Paratyphoid	0.28	0.01

Figure 1.1
Incidence Rate and Mortality Rate of Communicable Diseases
Source : Disease Control Division, Ministry of Health Malaysia (2024)
https://www.moh.gov.my/index.php/pages/view/324?mid=283

In contrast, Byrd-Bredbenner (2013), Langiano et al. (2012) and Grasso et al. (2016) exposed that foodborne diseases were then on the rise and so the true number of cases is likely to be underestimated due to the inadequate reporting of outbreaks occurring in the homes of food producers. Meanwhile, in May 2020, there were nearly 100 cases of food poisoning reported in Terengganu due to the consumption of a homemade Malaysian

dessert called "puding buih", that was bought online and which contained spoiled eggs that had exceeded their expiry date by two weeks (The Sun Daily, 2020; Food Poisoning News, 2020). Then, on the 3rd of June 2020, it was reported that a woman aged 25 years had died after eating "puding buih" from the same online homemade food producer (New Straits Times 2020; The Star, 2020). Following this case, the State Local Government, Housing, Health and Environment Committee Chairman, Dr. Alias Razak mentioned that the Health Department is required to provide detailed SOPs for homemade food producers because most of them are running their business without a licence. They simply cook their products at home and market them online, and so the safety and hygiene practices of the food prepared by them can be doubtful. The alarming rate in the increase of unsafe food products, starting from the preparation to the delivery stage, needs immediate attention as this can manifest to be a great problem in the future. It is, therefore, apparent that there is a need for empirical research on food safety governance among homemade food producers. There have been relatively limited previous studies, with minimal emphasis on issues relevant to Malaysia, particularly those addressing policy establishment, system regulation, and continuous monitoring of homemade food safety among online food producers. This study therefore attempts to fill this research gap by highlighting the possible actions and decisions required by governing bodies to ensure food safety among online homemade food producers in Malaysia.

1.4 Research Aims and Research Questions (RQ)

In the context of the research background and problem statement, the foremost aim of this research was to explore "How to govern food safety among online homemade food

producers in Malaysia". Based on this aim, the following research questions were formulated to guide this research:

RQ1 – How to ensure online homemade food producers register their business, to enable food regulatory bodies to trace their records or details?

RQ2 – How are food preparation processes undertaken and how are safety standards in relation to homemade food addressed by online food producers?

RQ3 – How to impose the detailed SOPs and guidelines for online homemade food producers?

1.5 Research Objectives (RO)

In regard to the background to the study and issues highlighted in the problem statement, this study seeks to address the following research objectives (RO):

RO1 – To describe the actions or strategies that can be taken to ensure online homemade food producers register their business, so as to enable food regulatory bodies to trace their records or details.

RO2 – To discover the food preparation processes undertaken and safety standards in relation to homemade food addressed by online food producers.

RO3 – To describe the strategies or policies that can be established to impose detailed SOPs and guidelines for online homemade food producers.

1.6 Significance of the study

This research has the potential to have a beneficial impact on Malaysia's society and economy. One of the significances derived from the findings of this study is the provision of an in-depth understanding of the current food safety governance that may guide online homemade food producers to carry on their business smoothly and ethically in the long run. Thus, homemade food products with the best quality, safety and nutrition can be produced (Khan, Chamhuri & Farah, 2015). Directly, this will further benefit the nation in terms of affording a good reputation and image emanating from the food sector.

By conducting this research, the degree of exposure regarding digitalisation of business among food producers can be disseminated and better understood. This will encourage those food producers which still undertake their business activities in a more traditional manner to move their businesses online and specifically utilising an established e-commerce platform which has been announced by the government through the PENJANA incentive (PENJANA, 2020). More fundamentally, undertaking such research enables the obtaining of information related to the improvement needed in the aspects of food safety standards and food safety practices.

Recent studies have explored various aspects of food safety. For instance, Risyawati, Fatin Aiman and Mastora (2018) investigated the food safety issues specifically in the northern part of Malaysia, namely Kedah. They discovered that food service operators in educational institutions have failed to adhere to government regulations. Additionally, Jawed et al. (2020) examined the factors required to maintain food safety among food handlers in the food industry during COVID-19, concluding that the positive attitude of food producers and adherence to food safety regulations play crucial roles. Despite

extensive research on those issues, significant gaps remain particularly in addressing food safety governance at the homes of food producers.

This exploratory study (basic or fundamental research) has identified critical gaps within the current regulatory framework that renders homemade food producers vulnerable to producing unsafe foods. Hence, this research offers valuable insights for policymakers to formulate more effective regulations, thereby ensuring safer food practices and safeguarding public health. In addressing the identified gaps, this study aims to develop a comprehensive model of food safety governance. By employing a mixed-methods approach, it is hoped that the findings of this research will provide new insights into the improvements needed in the aspect of food safety standards and practices among governing bodies and homemade food producers, contributing to both theory and practice.

1.7 Scope of the Study

The main objective of this research was to explore how to govern food safety among online homemade food producers. This research was confined to a developing country, namely Malaysia. In addition, this research focused on selected food regulators (food technologists) within the Department of Home-Based Products, Ministry of Health (MOH). These professionals are tasked with the enforcement of food safety standards, practices, guidelines and regulations established for food producers. In the same vein, they are responsible for monitoring and investigating compliance with these standards. Moreover, this research sought to involve homemade food producers or business owners that are currently in the market and sell their food products via e-commerce or online platforms.

This approach was purposely chosen so as to gather information on and understand their current practices in handling food for their businesses.

1.8 Organization of the Thesis

This thesis is organised into ten chapters.

Chapter One introduces the study and provides the background to the research, outlining the context that shaped the investigation of food safety governance among online homemade food businesses in Malaysia. The chapter presents the research problem, research aims and objectives, research questions, the significance of the study, and concludes with an overview of the thesis structure.

Chapter Two reviews the relevant literature underpinning the study. It examines key concepts related to food safety governance, food safety culture, food safety climate, and the behavioural aspects of home-based food producers. The chapter also reviews existing regulatory frameworks and government legislation, identifying gaps in the literature related to informal and digital food systems. These insights inform the conceptual foundations of the study.

Chapter Three details the research methodology adopted in this thesis. It outlines the research paradigm and overall study design, followed by descriptions of the study participants and recruitment processes. The chapter explains the data collection methods, including the survey, semi-structured interviews, and focus group discussions. It also describes the mixed-methods data analysis procedures and addresses ethical considerations.

Chapter Four reports on the pilot study conducted to refine the survey instrument. This chapter evaluates the questionnaire in terms of clarity, content validity, readability, response patterns, and completion time, and presents revisions made prior to full data collection.

Chapter Five presents the empirical findings of the study by integrating evidence from the survey of online homemade food producers, semi-structured interviews with food technologists, and focus group discussions with key stakeholders. The quantitative findings summarise participant characteristics, food safety practices, registration behaviours and levels of food safety awareness, while the qualitative findings explore regulatory perspectives, enforcement challenges, governance practices, communication, cooperation and capacity-building within the online homemade food sector. Together, these findings provide a triangulated understanding of food safety governance and inform the analysis and discussion presented in the subsequent chapters.

Chapter Six integrates and synthesises the quantitative and qualitative findings. The chapter compares the empirical results with the existing literature and develops a proposed food safety governance framework tailored to online homemade food businesses.

Chapter Seven concludes the thesis by revisiting the research objectives, summarising the key contributions of the study, discussing limitations, and proposing directions for future research.

Chapter Eight provides a reflective account of the research journey, offering personal insights into the methodological, academic, and experiential dimensions of completing the PhD.

CHAPTER TWO
LITERATURE REVIEW

2.1 Chapter Structure and Content

The previous chapter introduced the study by presenting its background, aims, research questions, significance, and overall structure. Building on this foundation, this chapter focuses on reviewing conceptual and empirical literature on food safety governance in relation to homemade food producers. Specifically, it examines food standards in Malaysia, reviews food contamination cases reported across various states, and identifies key factors contributing to foodborne diseases. In addition, the chapter critically discusses the definitions and characteristics of homemade food and food safety to establish a clear conceptual framework for the study. The chapter concludes by identifying gaps in the existing literature, which inform and justify the focus of the present research.

2.2 Conceptualising Culture

The concept of culture, along with its significance, has been a subject of interest in both academic and non-academic communities, recognised for its complexity, deep historical roots and diverse interpretations (Tharp, 2009; Lund 2003; Duranti, 1997). Scholarly fields which delve into the idea of culture struggle to offer a universal definition, leading to numerous debates and dissimilarities (Halloran & Kashima, 2006; Kashima, 2001; Gregor et al., 2000; Duranti, 1997; Hofstede, 1980; Tylor, 1871). One instance is the study that examined 164 unique concept and aimed to classify them, ultimately finding that there was no consensus regarding its origins by the early 1990s (Kroeber and Kluckhohn, 1952).

Nevertheless, Hofstede's comprehensive framework on the concept of culture, introduced in 1991, was later utilised in business studies (Hofstede, 1991). Below (Table 2.1) are some concepts of culture by several distinguished researchers in the field.

Table 2.1
Summary of Culture Concept

Author	Year	Culture Concept
Tylor	1871	A broad concept that covers knowledge, beliefs, arts, ethics, laws, tradition and all other skills and practices humans develop as part of a community.
Kroeber & Kluckhohn	1952	The distinctive accomplishments of human societies are reflected in culture, which is expressed through behaviour patterns and symbols.
Newman & Nollen	1996	The core organising concepts influence employees' perceptions of their roles, their methodologies and their expectations regarding treatment.
Braff & Nelson	2020	A culture is made up of shared beliefs, practices and symbols which create an integrated whole that molds people's outlooks and ways of living.
Coreil et al.	2001	Culture represents a learned approach to thinking and acting within social groups that persist through the ages.
Van Oudenhoven	2001	Deep-seated beliefs, values and customs commonly held by most individuals within a nation are evident in their behaviours at school within families and in the workplace and are further reinforced by national laws and governmental regulations pertaining to family life, commerce and beyond.
Hofstede & Minkov	2010	Culture can be summarised into several categories. Firstly, based on one's country (for migrants), Secondly, by region such as ethnicity, religion or language. Thirdly, by gender whether a girl or a boy is born. Fourthly, by generation including separating grandparents, parents and children. Fifthly, by social class which covers education and profession. Lastly, by work socialisation, which includes organisation, department and company that relates to the employees.
Casey, Riseborough & Krauss	2010	The shared cognitive patterns are unique to the people living in a specific region or area.

Table 2.1 presents key concepts and critical aspects derived from culture studies that could be pivotal in food safety culture research. Current research acknowledges that culture; specifically national culture as a key component of an organisation's context, shaping its operational and performance outcomes (Lok & Crawford, 2004; Havold, 2007; Burke, ChanSerafin, Salvador, Smith, & Sarpy, 2008; Mearns & Yule, 2009). The situation is more intricate as numerous organisations operate on a multinational scale are situated in various geographical regions and face a range of internal and external factors (such as operational traits and sector or market demands) (Nyarugwe, 2016). Nonetheless, this research is concerned with homemade food producers, where the business is generally run by the owner on a small scale, rather than being part of a large, stable organisation. Hence, the adopted culture is directly relevant to the following discussion.

For this study, culture is defined as a set of shared values, beliefs, norms and routine practices that are learned and sustained within a social context and that shape how individuals perceive, make decisions and behave in their daily activities. In the context of homemade food producers, culture is reflected in how food is prepared, handled and regulated, and it directly influences food safety attitudes and practices at the individual and household level. This indicates a clear gap in the literature concerning the role of culture in shaping food safety practices among homemade food producers.

2.3 The Organisational Context of Culture

Organisational culture is widely recognised as a critical element that shapes how organisations function and how individuals behave within them. Ashkanasy, Wilderom and Peterson (2000) argue that culture provides organisations with a distinctive identity by

influencing shared understandings, expectations and patterns of behaviour. Viewed from this perspective, organisational culture is not simply a background feature but a central mechanism through which organisational character and continuity are established.

The development of organisational culture is closely linked to how organisations respond to challenging circumstances over time. Schein (1992) highlights that the solutions introduced by founders or key leaders when addressing significant problems often become embedded as taken for granted assumptions. Such challenges may be internal, including major safety incidents, organisational restructuring or workforce reductions, or external in nature, such as economic pressures, legal requirements or technological change. As Hofstede (2001) notes, these external forces frequently require adaptation, leaving a lasting imprint on organisational practices.

As these responses are repeated and reinforced, shared patterns of meaning gradually emerge. In this context, Schein (2010) conceptualises organisational culture as a set of shared basic assumptions developed through collective learning related to external adaptation and internal integration. Because these assumptions have demonstrated effectiveness, they are regarded as valid and passed on to new members as appropriate ways of perceiving, thinking and feeling. This theoretical framing has been widely adopted within organisational research due to its ability to explain both stability and change in organisational life (Bloor, 1999; Balmer and Wilson, 2001; Martins and Terblanche, 2003).

While internal learning processes play a significant role, organisational culture is also shaped by broader societal influences. Van Oudenhoven (2001) suggests that national culture affects shared values and norms across multiple social settings, including workplaces, thereby influencing organisational behaviour. This influence becomes

particularly apparent in multinational organisations, where different national cultural orientations coexist within a single organisational structure. Seymen and Bolat (2010) further emphasise that organisational culture is continuously moulded by national culture, contributing to variation both within and across organisations.

To analyse these cultural dynamics, researchers have adopted different theoretical perspectives. From a functionalist viewpoint, organisational culture is treated as something an organisation possesses. This perspective focuses on formal and observable elements, such as rules, policies, procedures and structural arrangements, which shape behaviour and can be managed or modified through intervention (Davies, Nutley and Mannion, 2000). As such, the functionalist approach is often associated with managerial efforts to improve performance or safety outcomes.

In contrast, the interpretive perspective conceptualises organisational culture as something an organisation is. Rather than focusing on formal structures, this approach emphasises shared meanings, values and assumptions that develop through social interaction and everyday practice. According to Glendon and Stanton (2000), culture from this perspective is dynamic and continuously constructed, shaping behaviour in subtle but powerful ways that are not always visible or easily measured.

Although functionalist and interpretive perspectives differ in emphasis, a comprehensive understanding of organisational culture requires consideration of both. De Witte and Van Muijen (1999) argue that recognising underlying assumptions helps explain the presence and operation of formal systems, while Maull, Brown and Cliffe (2001) suggest that combining these lenses enables more effective and context sensitive interventions.

Integrating these perspectives therefore provides a more holistic account of organisational culture and supports deeper analysis of its influence on organisational practices.

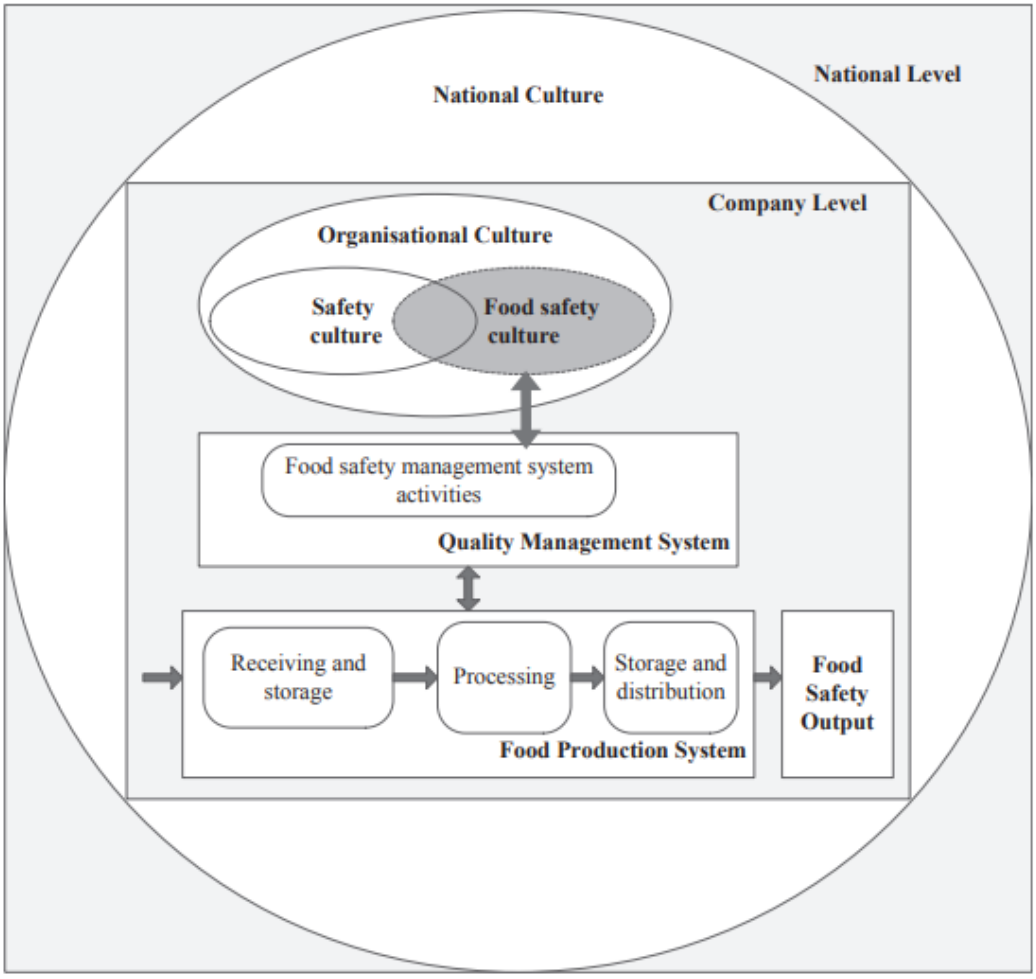


Figure 2.1
The interaction between national culture and company-level factors (organisational culture, FSMS, food production system and food safety output) impacts food safety. Source: Adopted from Nyarugwe et al. 2016

Table 2.2
Summary of Organisational Culture Concept

Author	Year	Organisational Culture Concept
Goffee & Jones	1996	A result of how individuals connect and engage with one another.

Thompson et al.	1996	The overall values, beliefs and ideologies of the people who constitute an organisation.
Bloor	2020	An outcome stemming from both vibrant and internalised ethics.
De Witte & Van Muijen	1999	Culture represents a learned approach to thinking and acting within social groups that persist through the ages.
Davies et al.	2000	A characteristic that arises from the individual components of the organisation.
Seel	2000	The outcome of the ongoing exchanges about values, meanings and properties between the employees in company and their surroundings.
Hofstede	2001	The common cognitive approach that identifies the members of one organisation as different from those of another.
Maull et al.	2001	The unique language of each organisation, which expresses its values, social ideals and shared beliefs is a product of its historical and operational experience.
Martins & Terblanche	2003	Profoundly ingrained (often subconscious) values and beliefs held by members of an organisation.
Van Den Berg & Wilderom	2004	Collective insights into work practices within organisational units, which might contrast with those in other units.

Literature commonly describes organisational culture as comprising multiple interconnected elements, including values, assumptions, beliefs, artefacts and symbols. These components collectively shape how culture is expressed and understood within organisational settings, although their relevance differs in terms of accessibility and measurability. While values, assumptions and beliefs are central to conceptualising organisational culture, their largely intangible nature presents challenges for empirical investigation.

Because values, assumptions and beliefs are not directly observable, they are often difficult to assess when examining an organisation's existing culture. As a result, their usefulness for empirical evaluation is limited unless they are interpreted through more visible

organisational features. Prior research suggests that such underlying elements can be inferred indirectly through tangible aspects of organisational life, including physical layouts, organisational design and the use of protective equipment or symbols, which act as outward expressions of deeper cultural meanings (Bloor, 1999; Martins and Terblanche, 2003; Schein, 2010).

Among these components, values are most frequently examined due to their expression through everyday work practices. Hofstede (2001) argues that values are reflected in how work is organised and performed, rather than solely in formal statements or policies. Building on this view, Van Den Berg and Wilderom (2004) contend that values should be operationalised through systematic examination of both perceived and actual work practices. Such practices are more readily observable and therefore provide richer insight into the values that underpin organisational activities.

However, organisational culture is rarely uniform. Empirical studies have consistently identified the presence of multiple subcultures within and between organisations. Research by Thompson et al. (1996) and Davies et al. (2000) highlights that different groups may develop distinct cultural patterns depending on their roles, responsibilities and local contexts. Although a dominant culture may exist at organisational level, its interpretation and enactment often vary across departments, hierarchical levels and groups of employees with differing cultural orientations.

The manifestation of these subcultures can be seen in the prioritisation of organisational goals. For example, certain departments may emphasise productivity or profitability, while others place greater importance on safety considerations. Such variations illustrate how cultural priorities are shaped by functional demands and local expectations. Previous

studies have shown that these differences are not confined to departments alone but may also reflect broader organisational dynamics (Cooper, 2000; Bloor, 1999; Sadri and Lees, 2001).

Cultural variation is also evident across organisational hierarchies. Goffee and Jones (1996) suggest that senior management, middle management and operational staff may hold differing priorities and values, resulting in divergent interpretations of organisational culture. These differences can influence how policies are implemented and how objectives such as safety and performance are balanced in practice.

Despite the presence of multiple subcultures, the existence of a dominant organisational culture remains important. Sadri and Lees (2001) argue that dominant cultural values should be sufficiently visible to enable employees to recognise, accept and engage with them. When dominant cultural expectations are clearly communicated and consistently reinforced, organisations are better positioned to align individual behaviour with collective goals.

2.4 Safety Culture

Having discussed culture in relation to the research area, it is important to address the meaning of safety culture. The concept of safety culture has been a significant focus in early work. The International Atomic Energy Agency's (IAEA) report on the Chernobyl incident attributed the disaster partly to a a 'poor safety culture' at the plant and within the broader Soviet context (INSAG, 1986; Antonsen 2009). This has prompted extensive research and the development of a wide range of measurement tools and framework across different sectors, such as rail (RSSB, 2011), aviation (Isaac et al. 2002), the nuclear

industry (Lee, 1998; Lee and Harrison, 2000), offshore installations (Mearns et al., 2003) and construction (Fang and Wu, 2013). Since its early days, the concept of safety culture has sparked intense debate. The mere mention of 'culture' can lead to vastly different interpretations. In his book Keywords, literary theorist Raymond Williams (1993) identified hundreds of definitions. The quote from James Reason at the start of this chapter and the title of Cox and Flin's (1998) paper, "Safety Culture: Philopsopher's Stone or Man of Straw?" highlight the contentious discussion that have unfolded over time.

As depicted in figure 2.1, safety culture is an integral part of organisational culture which prioritise and affects the safety outcomes of an organisation (Cooper, 2000). Cooper (2002), Fernandez-Muniz, Montes-Peon & Vazquez-Ordas (2007) and Luning & Marcelis (2009) state that it refers to the individual traits, organisational features (such as procedures that support personnel in task execution) and work characteristics that affect safety, providing "contextual cues" that guide employee behaviour. Meanwhile Morrow, Koves & Barnes (2014) provide additional insights into these cues. Such "contextual cues" might encompass management's adherence to their stated commitments, the existence of a supportive culture and the emphasis placed on safety (Morrow et al., 2014). Table 2.3 delineates essential definitions pivotal to the study of safety culture.

Table 2.3
Depiction of Safety Culture

Author	Year	Safety Culture Depiction
INSAG	1991	The amalgamation of characteristics and attitudes within an organisation and its individuals that ensure nuclear plant safety issues are given the priority they deserve.
Wiegmann et al	2004	The enduring traits of an organisation as evidenced by its consistent approach to managing critical safety.

Fernandez – Muniz et al	2007	The collective values, perceptions, attitudes and behavioural patterns concerning safety shared by the organisation's members as well as the policies, practices and procedures designed to reduce occupational risks, implemented across all levels of the organisation, reflecting a high degree of concern and commitment to accident and illness prevention.
Morrow et al	2014	An element of organisational culture that embodies shared beliefs, values and attitude to guarantee safe operations.

2.5 Safety Climate

The spectrum of perception that define safety climate is extensive (Christian, Bradley, Wallace, Burke & Spears, 2009). Prior to the advent of the safety culture paradigm, the notion of safety climate was extrapolated from the broader framework of organisational climate (Zohar, 1980). Organisational climate is characterised as a collective phenomenon, incorporating the shared perceptions of the meanings attributed to policies, practices and procedures along with the experiences and behaviours that employees see being rewarded, endorsed and anticipated (Schneider et al., 2013, p. 362). Analogously, the concept of safety climate encapsulates employees' views on their organisation's safety protocols, procedures and the safety-oriented action of management (Flin et al., 2000; Griffin & Neal, 2000; Zohar, 2011, p. 143). Essentially, the primary objective of assessing safety climate is to scrutinise the non-technical dimensions of an organisation's safety performance (Zohar, 1980).

In 1980, Zohar undertook the initial extensive review of literature to elucidate why certain organisations are more prone to safety-related incidents and characterises safety climate as a "collective summary of employees' perceptions regarding their work environments".

Hence, these shared perceptions function as a guiding framework to discern behaviour that are deemed acceptable and those that elevate the likelihood of injury (Zohar, 1980, p. 96). Numerous scholars have since endeavoured to interpret this concept. Alruqi, Hallowell and Techera (2018) highlighted that 107 studies on safety climate published between 2000 and 2016, focused on the construction industry. However, the discourse quickly became complex, as the concept of safety culture and safety climate addressed the non-technological aspects of safety performance, leading to further ambiguity regarding the term's definition (Zohar, 1980) and the development of various models namely Guldenmund (2000), Reason (2000) as well as Zohar (2010). As more researchers dwelled on the subject, a clear definition and dimension of safety climate have been sorted out as summarised below:

Table 2.4
Various Definitions and Dimensions of Safety Climate

Author	Year	Safety Climate Concept
Definitions		
Zhang et al.	2009	Safety climate is commonly understood as employees shared attitudes, beliefs, and values regarding safety, representing a key dimension of the broader concept of safety culture.
Liu	2009	Safety climate reflects the overall sense of safety experienced by individuals within an organisation. This perception arises from both static elements (such as formal structures) and dynamic elements (such as daily practices and interactions).
Fogarty and Shaw	2010	Safety climate refers to employees shared perceptions of safety-related policies, procedures, and practices within an organisation, characterised by both hierarchical influence and varying levels of depth across organisational layers.
Dollard et al.	2012	The concept of safety climate incorporates both psychological safety climate and organisational safety climate, capturing employees' collective

		perceptions of how mental health and safety policies, regulations, and practices are prioritised in the workplace.
Liao et al	2014	Employees' perceptions and beliefs regarding safety-related matters serve as indirect indicators of an organisation's underlying safety culture.
Dedobbeleer and Beland	1991	Safety climate represents individuals' fundamental perceptions of their working environment and is shaped by two main dimensions: management's commitment to safety and employees' active participation in safety-related activities.
Varonen and Mattila	2000	Employees continuously observe their work environment, as well as the behaviours of colleagues and supervisors, and use these observations to develop safety-related cognitive frameworks that shape workplace behaviour and influence safety outcomes.
Silva et al.	2004	Organisational climate and safety climate consist of shared beliefs concerning organisational values, standards, practices, and norms, all of which are observable and measurable within the workplace.
Niskanen	1994	Safety climate is composed of characteristics of a specific organisation that are perceptible to employees and derived from the organisation's policies and practices affecting both workers and management.
Minerals Council of Australia	1999	Safety climate encompasses intangible organisational elements, including perceptions of safety systems, work-related conditions, and individual factors influencing safety within the enterprise.
Dimensions		
Zohar	1980	i) Perceived level of organisational commitment to safety ii) Importance and effectiveness of safety training iii) Employees' perceptions of accident risk in the workplace iv) Evaluation of safety management structures and safety committees v) Influence of safe production practices on promotion decisions vi) Employees' perceptions of management attitudes toward safety vii) Relationship between safe work practices and employees' social status

		viii) Role of enforcement and guidance in promoting production safety
Cox and Cheyne	2000	i) Compliance with safety rules ii) Employee involvement in safety matters iii) Priority given to safety iv) Quality of safety-related communication v) Physical work environment vi) Supportive organisational environment vii) Individual risk perception viii) Management's commitment to safety ix) Personal safety priorities and needs
Lan	2004	i) Work nature ii) Personal factors iii) Organisational influences
Cynthia	2005	i) Training ii) Worker participation iii) Return mechanism iv) Safety management commitment v) Communication and feedback vi) Cautious and safety-oriented attitudes
Huang et al.	2006	i) Safety training ii) Return to work policy iii) Post injury management iv) Safety management commitment
Zhang et al.	2009	i) Safety beliefs and awareness ii) Leadership focus and engagement in safety iii) Workplace risk identification and management iv) Management approach and leadership style v) Employee participation vi) Safety specialised agencies and their management vii) Stable workforce viii) Safety training ix) Standardisation of production
Vinodkumar and Bhasi	2009	i) Risk justification ii) Workers' attitude towards safety iii) Safeness of work environment iv) Priority for safety over production v) Management commitment and actions for safety vi) Workers' knowledge and compliance to safety. vii) Emergency preparedness in the organisation viii) Worker's participation and commitment to safety
He	2010	i) Safety management ii) Safety attitude

		iii) Safety consciousness iv) Safety behaviour
Ye et al.	2014	i) Safety policy ii) Safety training iii) Risk preparation iv) Safety consciousness v) Managers promise vi) Supervisory behaviour vii) Secure communication
Barbaranelli et al.	2015	i) Management values ii) Communication iii) Training iv) Safety system
Wang et al.	2016	i) Management style ii) Work environment iii) Employee participation iv) Safety thought and idea v) Safety training and education vi) Safety mechanism and methods vii) Risk identification and prevention viii) Standardisation of operation process ix) Leadership attention and participation
Givehchi et al.	2017	i) Management safety priority and ability ii) Management safety empowerment iii) Management safety justice iv) Workers' safety commitment v) Workers' safety priority and risk non-acceptance vi) Safety communication, learning and trust in co-workers' safety competence vii) Workers' trust in efficacy of safety systems

Despite the limited number of studies that directly examine the influence of individual psychological states and work experience, the concept of safety climate remains central to understanding safety perceptions and preventing accidents. Safety climate is primarily a psychological phenomenon that captures how safety is perceived within a particular organisational or environmental context over a defined period. It is closely associated with intangible situational and environmental factors and reflects a temporary snapshot of safety culture rather than a stable or enduring condition. Due to its transient nature, safety climate

is inherently sensitive to change and can be easily influenced by shifts in organisational priorities, working conditions or external pressures.

In addition to its perceptual and temporal characteristics, safety climate encompasses the cognitive features of the work environment, including production processes, organisational policies and management practices that signal how safety is prioritised. Evidence drawn from industry-wide research indicates that safety climate operates across three interconnected levels: organisational, individual and environmental. At the organisational level, leadership commitment and formal systems shape safety expectations; at the individual level, perceptions and attitudes influence behaviour; and at the environmental level, physical and situational conditions affect exposure to risk. Together, these levels provide a comprehensive framework for understanding how safety climate functions within complex organisational settings.

2.6 Safety Culture alongside Safety Climate

Debate surrounding the relationship between safety climate and safety culture has been prominent within the literature for several decades. From an early stage, researchers noted that the two concepts were frequently used interchangeably, despite emerging from different intellectual traditions (Cox and Flin, 1998; Denison, 1996; Grote and Kunzler, 2000). This conceptual overlap has contributed to persistent ambiguity, particularly in relation to terminology, conceptual boundaries and methodological consistency. According to Choudry et al. (2007), these difficulties can be traced back to the initial development of the concept of safety culture following the 1986 Chernobyl disaster, where the definition adopted was not aligned with contemporary organisational theory. Consequently,

subsequent studies often blurred the distinction between culture and climate, sometimes referring to safety culture when examining safety climate phenomena (Grote and Kunzler, 2000).

More recent efforts have sought to clarify this distinction by emphasising the scope and depth of each construct. In some contexts, including studies emerging from Chinese enterprises, safety climate has been defined primarily in relation to employees' attitudes, beliefs and values concerning safety. Within this framing, safety climate is positioned as a component of the broader safety culture, reflecting its current or surface level state. Employees' perceptions of safety practices and issues are therefore treated as proxy indicators that provide insight into the organisation's overarching safety culture. This interpretation reinforces the view that safety climate captures how safety is presently experienced, rather than the deeper and more enduring cultural foundations that underpin it.

Despite these contributions, conceptual clarity remains a challenge. Choudry et al. (2007a) argue that further refinement is still required, particularly given the wide range of research methods and levels of analysis employed in the field. Methodological diversity has compounded complexity, as safety climate is commonly measured through survey instruments that capture individual perceptions, whereas safety culture is concerned with deeply embedded beliefs, values and assumptions that are less easily accessed (Guldenmund, 2000). As a result, researchers have questioned the validity of relying solely on questionnaire-based approaches when investigating safety culture. Instead, a multifaceted and methodologically plural approach has been advocated to capture the

complexity of cultural processes (Cooper, 2000; Wiegmann et al., 2004; Morrow et al., 2014).

A substantial body of research positions safety culture firmly within the broader domain of organisational culture. Scholars such as Mearns and Flin (1999), Wiegmann et al. (2004) and Fernandez et al. (2007) emphasise that safety culture represents one dimension of organisational culture, shaped by shared values, norms and behavioural expectations. Within this framework, safety climate is consistently conceptualised as a subset of safety culture rather than a separate construct (Mearns and Flin, 1999; Wiegmann et al., 2002; Colla et al., 2005). While safety culture encompasses enduring beliefs, norms, attitudes and behaviours related to safety, safety climate is characterised as its more measurable and perceptible expression, focusing on tangible indicators that can be quantified (Colla et al., 2005).

Given this hierarchical relationship, it is unsurprising that the two constructs share several non-technological safety dimensions. Both safety culture and safety climate address individual perceptions and collective attitudes towards safety within the organisation. Neal and Griffin (2006), along with Cooper (2000) and Guldenmund (2000), note that each concept captures how workers interpret safety expectations and responsibilities. In addition, both constructs incorporate organisational characteristics such as management practices, leadership behaviour and structural arrangements, all of which influence employee behaviour and decision making in safety-related contexts (Wiegmann et al., 2002; Fernandez et al., 2007; Clark, 2002).

Despite these commonalities, an important distinction lies in their temporal stability. Safety culture is generally regarded as relatively stable and resistant to rapid change, as it is deeply

embedded within organisational values and belief systems. Guldenmund (2000) describes safety culture as enduring and difficult to alter for this reason. In contrast, safety climate reflects the current condition of safety and is more susceptible to fluctuation. Changes in leadership, working conditions or external pressures can quickly influence perceptions of safety, allowing safety climate to shift more readily. As Cox and Cox (1996) as well as Joomun *et al.* (2024) observed, safety culture develops gradually and mirrors organisational character over time, whereas safety climate responds more rapidly to prevailing conditions and can be understood as reflecting the organisation's current mood.

2.7 The Notion of a Quality of Culture

The importance of quality management as a crucial element for attaining distinction and nurturing a culture of quality is acknowledged (Henri, 2006; Cronemyr et al., 2017; Ibidunni et al., 2017; Dubey & Gunasekaran, 2015; Zakuan et al., 2010; Hietschold et al., 2014). Quality is a nuanced concept, with its meaning shifting based on different viewpoints and cirmcumstances (Charantimath, 2011; Zhang 2001). It has been pointed out by Deming (1986), Juran & Godfrey (1998), Oakland (2003) and Rawlings (2008) that quality often intersects with customer satisfaction from an organisational viewpoint. Simultaneously, Watson (2023) in his seminar "Building a Quality Culture that Works" presented at NKT HVC Ltd UK Quality Week, asserts that a quality culture serves as the cognitive framework, the foundational principles and the mental programming that shapes and directs individuals' behaviours. In the realm of food producers, maintaining high standards of quality is essential for securing a competitive advantage, fostering customer loyalty and satisfaction, boosting efficiency and profitability and minimising expenses

(Harrington & Keating, 2006; Wang et al., 2012). Mohsen (2009) emphasise that recognising quality as a pre-requisite for customer satisfaction is an essential strategy for organisations aiming to delight and retain their current customers, draw in new customers and ultimately achieve commercial success.

The pursuit of quality commenced with the establishment of a quality management system, structured upon a framework designed to guarantee the uniform and effective application of procedures, knowledge, competencies, techniques and controls across all operations (Oakland, 2003). Furthermore, a quality management system assists an organisation in setting precise standards, managing and improving both process and product quality (Turusbekova et al., 2007). It also enables effective communication of regulations and procedures, ensures the supervision of performance and promotes better collaboration among team members (Dale, 2003). In this context, Deming (1986), Juran (1988), Feigenbaum (1991) as well as Ishikawa and Lu (1985) have been credited with the introduction of Total Quality Management (TQM) into the management literature within the manufacturing sector. TQM emphasises that all employees within an organisation are involved in contributing to the final product or service (Total). Quality refers to both subjective and objective standards that can be assessed by all members of the organisation. It is also evident that an implementation of TQM is a managerial duty, starting from the top levels of leadership and extending to every employee throughout the organisation (Rawlings, 2008).

Several researchers such as Beshah and Berhan (2017), Ooi et al. (2008) and Al-Marri et al. (2007) have demonstrated that despite the robustness of the TQM philosophy, its implementation yields varying degrees of success. To enhance organisational success,

Boynton and Zmund (1984, p.17) suggest identifying critical success factors (CSFs), which serve to pinpoint the essential elements that must be effectively executed. This approach has been employed by several researchers in the field of quality management namely Kanji & Yui (1997), Aquilani et al., (2017) Sreedharan & Sunder (2018), yet there remains a lack of consensus on the core factors that drive successful TQM implementation (Hietschold et al., 2014); Conca et al., 2004). The prevailing view is that these core factors can be categorised into two main groups, with hard factors including production techniques like process control and soft factors encompassing executive commitment and leadership (Black & Porter, 1996; Bou-Llusar et al., 2009; Modgil & Sharma, 2017; Rahman & Bullock, 2005; Saleh et al., 2018). Najeh (2006) further corroborates that multiple studies have highlighted several common factors across different investigations.

Despite the obstacles, leadership remains fundamental to the development and maintenance of a quality-driven culture (Chuan & Soon, 2000). Leaders must have a comprehensive understanding of the existing organisational culture, including its perceptions of quality, alongside its values, beliefs and norms, in order to decide which of these aspects should be retained or reformed (Fox, 1991; Malhi, 2013; Gherbal et al., 2012). Studies on management leadership highlight the necessity of fostering an environment of trust and encouraging a spirit of collaboration to achieve high standards of quality (Koehler & Pankowski, 1996; Watson & Heworth, 2012). Furthermore, engaging employees in the process of cultural change (Malhi, 2013; Gherbal et al., 2012), coupled with open and effective communication at every level, supporting workgroup dynamics, appropriate training and incentive systems, can significantly boost employees' commitment to adopting and integrating a quality-focused culture (Yasin et al.,2004; Arawati, 2005;

Llorens & Verdu, 2004). Therefore, establishing a quality culture requires the transformation of stakeholders' attitudes, skills and competencies within the system. Although the process is gradual, it is nonetheless crucial, as it evolves progressively rather than occurring through abrupt changes. Specifically, quality and safety are vital objectives for high-reliability organisations including sectors such as healthcare, food production, construction, aviation and nuclear power. The following section will delve further into this relationship.

2.8 The Linkage between Safety Culture and Quality Culture

Extant literature suggests that safety and quality culture are integral components of organisational culture (Kanji & Yui, 1997; Guldenmund, 2000; Hale, 2000; Cox & Cox, 1991; Mohammed, 2003; Choudhry et al., 2007a; Wolniak & Olkiewicz, 2018). Both necessitate active employee participation, committed leadership and robust mechanisms for organisational learning (Llorens & Verdu, 2004; Arawati, 2005; Guldenmund, 2000; Choudhry et al., 2007b). While safety culture prioritises workplace health and safety, quality culture focuses on the organisation's quality management practices (Wolniak & Olkiewicz, 2018). Despite their distint focuses, they share numerous similarities and can coexist within the same organisational environment, facilitating the coordination of management activities (Wolniak & Olkiewicz, 2018).

Drawing from the aforementioned points, safety management can be conceptualised as a comprehensive strategy that fosters active participation and contributions from both management and employees (Hursul et al., 2008). This strategy is underpinned by a meticulously organised system that includes policies, procedures, employee roles,

communication channels, monitoring mechanisms and environmental factors (Hinze & Wilson, 2000; Jaselskis et al., 1996; Dedobbeleer & Beland, 1991). Safety programmes offer a diverse array of strategies, facilitating the creation of effective health and safety plans (Hursul et al., 2008). Conversely, quality management is characterised by a series of actions aimed at optimising efficiency (Hursul et al., 2008). It extends beyond the products and services delivered to customers, encompassing all aspects of an organisation's processes, tasks, actions and decisions to prevent narrow-focused management (Ghaleiw, 2013).

Nonetheless, Love et al. (2016) reported that the rise in accidents due to quality lapses and regulatory violation (non-compliance) is largely driven by the inability of industries to clearly differentiate between safety culture and quality culture. These occurrences are often ascribed to factors including worker fatigue, occupational stress and the physical demands imposed by excessive workloads, which contribute to quality deficiencies (Alavosius et al.,2018). Exploring high-reliabilty organisations (HROs) within sectors like construction, nuclear energy, aviation, healthcare and food production yields valuable insights into the practical dynamics between safety and quality. These oganisations represent complex setting where individual aided by sophisticated technology and perform highly precise taks that are prone to disruption at any time. Nevertheless, these organisations are required to sustain optimal performance levels, frequently operating continuously with multiple layers of redundancy and safety measures to guard against both human and technical failures (Alavosius et al., 2018; Sutcliffe, 2011).

The intersection of food safety and quality is apparent in the food industry, with both dimensions being addressed by globally recognised standards such as Good Manufacturing

Practices (GMP), Hazard Analysis Critical Control Points (HACCP) and Good Hygienic Practices (GHPs) (Griffith, 2017; MOH, 2023) Originally aimed at addressing food safety, HACCP has been associated with broader discussion on food quality, with literature highlighting overlaps between these two areas. Previous scholars namely Sikora and Strada (2005) p. 86 outlined four key dimensions of food quality including safety (free from hazards), nutritional value (incorporating food health quality as a secondary attribute, sensory features (such as flavour and aroma) and convenience (hassle-free in preparation). From a systemic standpoint, food safety management is acknowledged as a critical element of quality management in the food industry and must not be neglected (Early, 1995). Further research such as Verbeke (2005), Rohr et al. (2005) as well as Van Rijswijk & Frewer (2008) have demonstrated that food safety is viewed by consumers as an essential quality feature. Customers viewed food quality and safety as closely related, with high-quality items considered inherently safe rather than safe products being regarded as high quality (Rijswijk and Frewer, 2008).

Additional concerns revolve around food fraud and food defence incidents (Manning & Soon, 2016; Spink & Moyer, 2011; Manning et al., 2016; Potter et al., 2012; Wright, 2016), These issues prompt the need for comprehensive risk evaluation and management efforts (Manning & Soon, 2016; Spink & Moyer, 2011). Spink and Moyer (2011, p.159) proposed a Food Risk Matrix to classify food quality, food safety, food fraud and food defence into four unique risk categories which are determined by intent and motivation. Manning and Soon (2016) further investigated how these categories, established by Spink and Moyer (2011) relate to the overarching notion of food crime while continuing to differentiate between food quality and food safety. Visciano and Schirone (2021) report that

international scandals involving fraudulent food, beverages and alcoholic products have been documented globally including Southeast Asia. This region, home to over 650 million people, is anticipated to become the fourth largest economy by 2050. Key sectors such as agriculture and food manufacturing significantly contribute to regional GDP growth (Vinayak et al., 2014). Small and medium enterprises (SMEs) constitute between 97-99 % of the enterprise population in most Southeast Asian countries with micro enterprises predominantly engaged in retail and agricultural activities (OECD, 2021). Consequently, ensuring food safety and traceability remains challenging in certain countries. Fraud models by Cressey (1973) and Wolfe and Hermanson (2004) indicate that this environment is conducive to fraudulent activities. Scientific studies have documented food fraud in the region such as rice fraud in Thailand (Kongsri et al., 2021), artificial enhancement usage such as urea to preserve fish and substituting local rice with imported grains in Vietnam (Tran, 2013; Vietnam Plus, 2021) as well as seafood substitution across various Southeast Asian countries (Abdullah & Rehbein, 2017; Panprommin & Manosri, 2022; Chin et al., 2016). In Malaysia, multiple food fraud incidents had been reported such as fake halal meat certification (Md Ariffin et al., 2021), counterfeit beverages (The Straits Times, 2015), mislabelling of beverages in food services (Aisyah, 2020) and diluting fresh palm oil with recycled cooking oil (Lim et al., 2018). Local media have also reported incidents of food fraud including adultered alcohol (Llewellyn, 2018; Rahimi et al., 2021), adultered honey and spices (Medenilla, 2022; Tuoi tre News, 2018). Despite these reports, the true prevalence of food fraud in the region remains uncertainty although Everstine and Kircher (2013) estimate that roughly 10% of commercially available food products are impacted. To address these concerns, even the Malaysian Ministry of Health (MOH) incorporates

food fraud and defence as requirements in their standards to protect against intentional contamination and weaknesses in the supply chain. For instance, the Food Regulations 1985, updated periodically, include provisions to ensure food safety and quality.

Consequently, any purposeful change of a food product's ingredients, packaging or labelling whether for financial benefit (such as food fraud) or ideology (such as food crime), may hurt consumers and undermine food safety and quality. Malaysia has faced significant food fraud issues such as the long-standing halal meat scandals where non-halal meat was fraudulently labelled and sold as halal for over 40 years. This scandal not only compromised consumer trust but also highlighted the need for stringent food safety standards and effective fraud detection mechanisms. Although efforts are made to distinguish between food safety and quality, practical considerations frequently merge these concepts resulting in comprehensive management systems. For instance, the ISO 22000 Food Safety Management System (FSMS) can be integrated with existing food safety systems such as Hazard Analysis and Critical Control Point (HACCP) as well as Good Manufacturing Practice (GMP) certifications. This establishes a standard from exemplary practices across the industry, from supply chain to end-user and ensures that food safety ang quality are consistently upheld, providing assurance to customers and other stakeholders.

Wolniak and Olkiewicz (2018, p.15) assert that in industrial organisations, food safety management systems (FSMSs) and quality management systems are often implemented concurrently, creating challenges in distinguishing the unique "culture' of each subsystem. Griffith et al. (2017) highlights that organisational culture surpasses established norms and systems, and if left unchecked, it can evolve independently, posing significant adverse

effects (De Boeck et al., 2017). For instance, food safety management systems have become a primary concern for food processing organisations and regulators, as most food incidents are attributed to failure in GMPs linked to employees' unsafe behaviour, rather than failures in the FSMSs themselves (Walker et al., 2003; Redmond & Griffith, 2003; Griffith et al., 2010b; Jespersen et al., 2016; Yiannas, 2009). Consequently, these matters have prompted government bodies and academics in the food sector to explore new methods for enhancing food safety by introducing the notion of food safety culture (Griffith et al., 2010b; Yiannas, 2009). The subsequent section explores this concept in detail. Before proceeding, a succinct explanation of what food safety entails, the critical role of FSMS and their influence on organisational performance is presented.

2.9 Defining Food Safety

Oyarzabal and VanRenterghem (2020) highlighted that the term "food safety" holds different meaning for the general populace, food safety experts and individuals within the food sector. While a limited number of studies address the concept of food safety (Food & Agriculture Organisation of the United Nations (FAO) 2003; Griffith, 2006; Borchers et al., 2010; Grunet 2005), a universally accepted definition remains elusive. This variation in understanding contributes to the absence of definitive interpretation. The definitions of food safety by several leading researchers are summarised in Table 2.5.

Table 2.5
Diverse Interpretations of Food Safety

Author	Year	Distinct Definitions of Food Safety
FAO	2003 (p.3)	The scope of food safety includes all potential dangers, both long-term and short-term that could

		affect consumer health, and it is a fundamental aspect that must not be compromised.
Grunert	2005 (p.381)	Author concluded based on an investigation into the correlation between food safety and quality from standpoint of consumer perception – food safety has dual interpretations: a narrow and a broader one. In the narrow context, food safety is defined as 'the antithesis of food risk implying the potential for certain disease to arise from consuming specific foods. Conversely, in the broader context, food safety also encompasses the nutritional attributes of food and broader concerns regarding the characteristics of unfamiliar foods.
Griffith	2006 (p.6)	The author who examined the historical context of food safety argued that food safety encompasses more than food microbiology is synonymous with food hygiene and includes all aspects of food processing, preparation and handling to ensure it is safe for consumption.
Arendt et. al	2011 (p.125)	Food safety is framed as a societal issue, describing it as "a worldwide concern".
Fung et. al	2018 (p. 88)	An essential human privilege.
Ucar et. al	2016 (p.19)	Food safety is recognised as the adherence to strict regulatory protocols or comprehensive standards.
Lingham et. al	2025	At the core of achieving food security lies food safety, encompassing systematic practices from initial production to final storage that collectively serve to maintain the safety and edibility of food commodities.
Yiannas	2019	The ways in which a company approaches food safety through its leadership and employee engagement, shaping its overall food safety outcomes.
Jespersen et al.	2019	An evolving set of company practices, strategies and employee behaviours that focus on producing safe food as a priority over other business interests.
Global Food Safety Initiative (GFSI)	2020	The collective behaviours, attitudes and action of a group, influencing the commitment to safe food handling and practices.
Luning et al.	2020	The way individuals and groups understand the importance of food safety, shaped by the organisation framework and values.
Nyarugwe et al.	2020	A reflection of organisational values and behaviour that ensure food safety, influenced by management practices and cultural norms within companies.

Watson	2021	A framework to measure cultural attitudes in food companies through the lens of control, communication, cooperation and competency.
Food Standards Agency (FSA)	2021	The shared values, beliefs and norms that affect mindset and behaviour towards food safety in, across and throughout an organisation.
FDA	2022	The ingrained attitudes, behaviours and beliefs shared by employees towards maintaining and prioritising food safety in their operation.
Watson	2024	A corporate mindset that integrates food safety into all levels of business operations, focusing on improving compliance and reducing contamination risks.

Contemporary discourse on the definition of food safety continues to evolve, reflecting the increasing complexity of global food systems. Recent studies demonstrate that food safety is perceived by industry professionals as a multifaceted concept encompassing management practices, adherence to proper production methods and stringent handling procedures (Luning et al., 2020.) A study conducted by Jespersen et al. (2019) utilised structured surveys targeting food industry stakeholders, revealing that definitions commonly emphasised risk mitigating during production and distribution stages, rather than intrinsic product quality. Interestingly, food-handling personnel often distinguish between food safety and food quality, opposing earlier findings where consumers tended to perceive these constructs as interrelated (Ucar et al., 2016; Jespersen et al., 2019). This divergence underscores the necessity for precise definitions within industry guidelines and public communication strategies. Although existing research primarily focuses on manufacturers and regulatory bodies, calls have been made for broader explorations incorporating perspectives from agricultural producers and service sector workers to achieve more comprehensive understanding. Scientifically, food safety is now increasingly defined as the implementation of systematic control measures throughout the food

production continuum, it is designed to prevent contamination and ensure the delivery of safe consumables to end-users. Within the hospitality sector, the visible assurance of food safety not only impacts local populations but also significantly affects the tourism industry, thereby reinforcing the importance of integrating health protection measures into customer-facing operations.

2.10 Global Food Safety Initiative (GFSI) and Food Safety Management Systems (FSMS)

In a global context, under the vision of "Safe Food Everywhere", the GFSI unites all stakeholders in the food industry to enhance FSMS worldwide (Fuchs, Kalfagianni & Havinga, 2011). Established by industry leaders in 2000, GFSI aims to develop collaborative solutions to address food safety risks globally. Experts from various sectors including retail, manufacturing, food service, academia, service providers, international organisations and government lead the GFSI community (Fulponi, 2006). Today, the GFSI is acknowledged as the global benchmark food safety (Crandall et al., 2012). The implementation of GFSI standards at food premises has garnered positive feedback from most food safety professionals, who have reported improvements in food safety practices, the production of safer food products and enhanced knowledge of safe food practices among food producers. Furthermore, GFSI supports food producers in preparing for upcoming regulatory changes. Consequently, a thorough and effectively implemented FSMS is crucial to ensure the safety of food products for consumption, thereby mitigating the risk of foodborne illnesses.

2.10.1 Previous Studies on FSMS in Developed Nations

Despite technogical advancements, the execution of FSMS differs across developed nations. As indicated by Fotopoulas et al. (2011) and Griffith et al. (2007), it is incumbent upon each organisation to formulate a FSMS that is specifically tailored to its individual requirements, taking into account factors such as the nature of business activities (production, food service or retail), the categories of food produced (meat, poultry, dairy, confectionery sectors) and the operational procedures, machinery and surroundings. European Union (EU) regulations have instituted comprehensive international safety and quality frameworks such as HACCP, Codex Alimentarius, British Retail Consortium (BRC), ISO 22000 and ISO 22000: 2018 which promote transparency and clarity throughout the supply chain, irrespective of the organisation's scale and complexity (Taylor, 2011; Griffith, 2014; Manning, 2017; GFSI, 2018). The adoption of these systems has demonstrated numerous advantages such as facilitating entry into global markets, bolstering food safety measures and ensuring adherence to international regulatory standards (Ramnauth, 2008; Konecka-Matyek, 2005; Panisello, 1999; Bas, 2007).

Nonetheless, the multifaceted challenges faced by food safety experts including regulatory, cultural, educational, economic and political nature persist even as they focus on technological aspects such as cleanliness standards, quality governance and safety compliance in food preparation (Stier et al., 2003; Varzakas et al., 2006; Al-Yousuf, 2011; Leon & Paz, 2014; Zhou et al., 2012; Malgas, 2016; Cheng et al., 2015). As an illustration, Varzakas et al. (2006) observe that Greece's Hellenic Food Safety Authority (EFET) struggles to cooperate effectively with governmental agencies to collect vital information, thereby compromising risk reduction efforts. Similarly, Ferreti (2006) highlighted

bureaucratic obstacles, intricate regulatory processes and a lack of transparency within Italy's food safety governance impede the nation's ability to meet international standards. In Mexico, although HACCP legislation exists, adherence is often voluntary and mainly practiced by tourism-related businesses and exporters (Leon & Paz, 2014). Zhou et al. (2012) revealed that despite holding the title of the world's largest meat producer, China has only 10% of its meat manufacturing plants HACCP-certified. Furthermore, Malgas (2016) pointed out that South Africa's FSMS are in place, yet the country still struggles to effectively pinpoint and manage foodborne outbreaks.

Across many nations, SMEs include a broad spectrum of business types such as home-based operations. In Taiwan, home businesses have been utilising a pre-counselling framework since 1998, but HACCP implementation remains inconsistent and ineffective (Jeng & Fang, 2003; Cheng et al., 2015). In contrast, home businesses in Europe that do not process food and directly supply consumers with simple, low-risk items are not required to follow HACCP guidelines because under European Food Laws 2005, these practices are regarded as voluntary efforts. Weinroth et al. (2018) contended that these businesses can safeguard against risks by following standard hygiene practices. Hence, although there are essential ways to mitigate foodborne illness, inherent risks to public health remain.

Byrad-Bredbenner et al. (2013) elucidated challenges faced during and subsequent to the implementation of FSMS. Financial limitations and satisfaction with the existing system were primary obstacles among Canadian food producers (Herath & Henson, 2006). In the realm of food safety compliance and governance within home-based food businesses, home is the primary site for foodborne illnesses particularly during the COVID-19 pandemic.

Shahbaz et al. (2020) revealed that the likelihood of food handlers neglecting standard operating procedures or precautionary measures during food preparation could exacerbate the spread of coronavirus in food production settings. This is supported by Charis (2020) which reveals the difficulty in preventing virus transmission among producers, retailers and consumers, especially in avoiding cross-contamination between cooked and raw meat. Another studies by Adenilma et al. (2020) highlighted that Brazilian food business owners with higher incomes face fewer challenges in adhering to food safety practices due to the availability of appropriate utensils and sufficient space in their home kitchens. It has conclusively been shown that there are additional challenges associated with the implementation of FSMS, as presented in Table 2.6. In addition, although government policy plays a crucial role in shaping the food system for the nation, the challenge part is that it requires well-established of regulation to manage and sustain the FSMS.

Table 2.6
Food Safety Challenges

Author	Year	Challenges in Food Safety
Webb & Morancie	2015	Older food producers often face disparities in access to education and training opportunity when compared to their younger counterparts.
Jouve Bas et al. Panisello & Quantick Eves & Dervisi Kulmyrzaev	1994 2007 2001 2005 2012	Small-scale food producers frequently employ traditional methods, depend extensively on family labour, operate under financial limitations, low level of education and social status.
Baş, Yüksel & Çavuşoğlu Sani & Siow	2007 2014	A limited understanding of food safety practices particularly in relation to HACCP training, often stems from the perceived complexity of these schemes and a fundamental lack of awareness regarding the principles of food safety.

Jouve World Health Organization (WHO) Newslow	1994 2006 2013	The effective implementation of FSMS scheme often requires both technical competence and sound business skills. However, as illustrated by the example of HACCP schemes, while producers may be aware of such frameworks, they frequently lack the necessary.
Uyttendaele, De Boeck, & Jacxsens	2016	Among food producers, there is often a resistance to continuous learning, as well as a limited engagement with critical thinking and problem-solving practices. This is exemplified by their reluctance to adopt innovation tools designed to enhance business efficiency.
Adeyeye	2017	There is a notable lack of information concerning the hazards and risks associated with foods produced using traditional methods, particularly in the absence of adherence to contemporary food safety guidelines.
Baş, Yüksel & Çavuşoğlu Bobodzhanova Asadov	2007 2012 2013	At the core of achieving food security lies food safety, encompassing systematic practices from initial production to final storage that collectively serve to maintain the safety and edibility of food commodities.
WHO	2006	Resource constraints and the absence of essential amenities frequently impede the development of on-site infrastructure, particularly in relation to sewage management, energy provision, water supply and transportation system.
Eves & Dervisi Griffith et al. Jones et al. Karaman, Cobanoglu, Tunalioglu & Ova	2005 2017 2008 2012	An evolving set of company practices, strategies and employee behaviours that focus on producing safe food as a priority over other business interests. Main barriers to successful HACCP system implementation are lack of knowledge relating to and the cost of HACCP.

2.10.2 Home-Based Food Businesses and FSMS in the Malaysian Landscape / Food Safety Governance in Malaysia's Home-Based Food Businesses

In Malaysia, home-based food businesses have become more widespread, largely due to affordable start-up costs and improvements in digital platforms for ordering and delivering

(Packierisamy et al., 2018). Kapasi and Galloway (2016) described home-based food businesses as ventures in which food is prepared in the food handler's domestic kitchen rather than in a restaurant or commercial setting. Table 2.7 outlines a wider array of definitions pertaining to home-based food businesses. Razak et al. (2022) argued that because homemade food owners' control and manage their own businesses without renting external premises, it inherently reflects entrepreneurial practice. Hence, this type of business has grown in popularity, with several highly successful companies having emerged from home kitchens especially throughout the Covid-19 pandemic.

The Malaysian government's implementation of the Movement Control Order (MCO) to contain the spread of Covid-19 led to the closure of food production facilities, restrictions on dining in restaurants and cafes and the suspension of many food service operations. This situation contributed to the rise of home-based food businesses as an alternative source of prepared food. Nevertheless, concerns have been raised regarding poor hygiene practices in food preparation, processing and serving among some home-based producers in which posing potential health risks to consumers. At present, Malaysia's legal framework for food safety in the home-based sector remains underdeveloped. From a legal standpoint, a major issue is the lack of specific guidelines addressing food safety producers for home-based producers. A study examining food safety and hygiene among such producers found that the microbiological condition of *keropok lekor* and the state of production premises in Kuala Terengganu and Marang reflected inadequate hygiene practices in processing areas (Hamat et al., 2019). To protect consumers from such harmful food products, regulations are enforced to be followed by the food producers (Elissa et al., 2019). A more in-depth account of food safety regulation in Malaysia is presented in section 2.10.2.1.

Table 2.7
Conceptual Variations in Homemade Food Business

Author	Year	Various Definitions of Homemade Food Business
Felstead and Jewson	2000	A household undertakes business operation from home on a full-time or part-time basis, where the income serves as a secondary or supplementary source.
Mason, Carter and Tagg	2011	A business entity that conducts commercial activities from the owner's residence, offering goods or services as its primary function.
Rosnafisah and Siti	2012	A government-led initiative aimed at empowering individuals, particularly women to engage in entrepreneurial activities from home, supported by institutional and community efforts.
Sayer	2012	The expansion of home-based businesses is attributed to the increased use of information and communication technologies (ICT) and lifestyle changes such as the 'down-shifting' trend.
Dahari et al.	2019	A business entity that conducts commercial activities from the owner's residence, offering goods or services as its primary function.

2.10.2.1 The Regulatory Framework Governing Food Safety in Malaysia / Food Safety Regulation in Malaysia

It is crucial for all food producers to fulfil the implementation of food safety legislation throughout food preparation and processing activities in order to establish an effective food safety system (FAO, 2024). In short, regulation is defined as legal intervention in the market by the government via administrative means (Guo et al., 2019). The Ministry of Health, Malaysia had endorsed the Food Act 1983 to be applied consistent with Food Regulations 1985 and Food Hygiene Regulations 2009. In Malaysia, both Food Act 1983 and Food Regulations 1985 are implemented at present as these legislations are the backbone of food safety programme that aim to safeguard the public against health hazard

and fraud in the preparation, sale and use of food (FAO, 2004). The Food Regulations 1985 has been revised and updated by the Technical Advisory Committee chaired by the Director of the Food Quality Control Division, Ministry of Health. On February 28, 2009, Food Hygiene Regulations 2009 had been gazetted by the government of Malaysia to ensure food safety and quality for consumers and combat the outbreak of foodborne diseases (MyHealth, 2017). Besides, the legislations, there are other legislations related to food safety in Malaysia, which are the Pesticide Act 1974, the Fisheries Act 1983, the Veterinary Surgeons Act 1974, the Animal Act 1953 and the Trade Descriptions Act 2011.

2.10.2.2 Food Safety Assurance System in Malaysia

The Food Safety and Quality Division (FSQD), Ministry of Health, Malaysia (MOH) has set up a system known as Food Safety Assurance Programme to safeguard consumers by preventing the distribution of unsafe food products. This programme comprises GMP and HACCP which are to be implemented by the food sectors. Such systems, despite being known to ensure promising, safe and quality food products, lead to difficulties to abide by and obtain the certifications among many food producers, especially the SMEs including home-based food businesses. Therefore, Malaysian government under MOH has introduced a scheme known as Food Safety is the Responsibility of the Industry (MeSTI) as the minimum assurance criteria to be implemented by the food producers in Malaysia (MOH, 2016; Ahamat et al., 2019). In addition, the food policies, standards, regulations guidelines are always revised and updated. These developments will lead to complexity and confusion if not tailored to the global policies and standards (King et al., 2017). Thus, it is the responsibility of local government and authorities to set up and update such guidelines to be aligned to the global standards.

One of the food quality management systems applied in Malaysia is the GMP. GMP is defined as the regulations which describe the methods, equipment, facilities and controls in producing processed food (FDA, 2004). GMP certification is an official recognition given to the food producers that comply with GMP aspects and meet the requirements to fulfil consumer's needs. In general, there are 11 elements of GMP stipulated in MS 1514:2022 (DSM, 2022) : i) design and facilities; ii) control of operation; iii) maintenance, cleaning and sanitation; iv) personal hygiene; v) training; vi) product information and traceability; vii) transportation; viii) internal inspection; ix) management review; x) documentation and records; and xi) legal requirements. GMP helps to boost consumers' belief and expand product market of the food industry both locally and internationally. In addition, GMP is a pre-requisite for the food industrial players to apply for HACCP certification. Both quality assurance systems provide strength and support of other assurance systems such as ISO and Malaysian Halal Certification.

2.10.2.3 Hazard Analysis Critical Control Point (HACCP)

HACCP is a food safety system based on seven principles that help control biological, chemical and physical hazards throughout the food manufacturing process (Nor et al., 2016). Historically, the HACCP systems were first set up by the Pillsbury Corporation due to demand from the National Aeronautics and Space Administration (NASA) to ascertain formal assurance on Food Safety (Razzif and Norzaidi, 2020b). The HACCP Certification Scheme had been launched in 2001 to provide recognition to the local food manufacturers that successfully adopt and maintain the HACCP system for their food products.

To obtain the HACCP certification, the food manufacturers must comply with all HACCP principles and elements of GMP, as stated in MS 1514 : 2009, MS 1480 : 2019 and MS

1514 : 2022 (DSM, 2009; 2019a; 2022) before being audited by the auditor appointed by the FSQD, MOH. Often, it is found that both GMP and HACCP are implemented as FSMS by the medium and large food companies but rarely adopted by the small food companies. The small players in food industry usually implement GMP management system due to limited financial resources (Kim-Soon et al., 2020; Abidin et al.,2020). According to FDA (1997), there are seven principles of HACCP : i) conduct hazard analysis; ii) determine critical control points (CCPs); iii) establish critical limits; iv) establish corrective actions; (vi) establish verification procedures and establish record-keeping and documentation procedures.

2.10.2.4 Regulations For Halal Food in Malaysia

Besides the GMP and HACCP certifications, the Malaysian Halal Certification is established to recognise the halal status of consumer food products and goods. This certification is authorised by the Department of Islamic Development, Malaysia (JAKIM) and States Religious Authorities (JAIN). According to Ahmed et al. (2018), the concept of halal varies and is not limited to food, but it also encompasses personal care, cosmetics and pharmaceuticals products. Likewise, the Malaysian Halal Certification is not only limited to food products. Likewise, the Malaysian Halal Certification is not only limited to food products. To date, there are nine aspects covered under this certification as highlighted in the Manual Procedure of Malaysian Halal Certification 2020 which are food and beverages, cosmetics, pharmaceuticals, food premises consumer goods, logistic services, abattoirs/slaughterhouses, original equipment manufacturer (OEM) and medical devices.

2.10.2.5 Halal Food

To be halal-certified food premises or products, the food industrial players should implement the halal guidelines (MS 1500 : 2019; DSM, 2019b) according to the Malaysian standards as well as the Manual Procedure for Malaysia Halal Certification (Domestic) 2020 guidelines prescribed by JAKIM. Recently, the MS 1500 series of standards had been revised three times, which were in 2004, 2009 and 2019. The latest revision of MS 1500 was harmonised with Codex Alimentarius which involves GMP, Good Hygiene Practice (GHP) and HACCP standards to minimise the inconsistencies between the existing food safety and quality standards and government's legislations (Ahmad et al., 2018). Moreover, the implementation of MS 1500 : 2019 (DSM, 2019b) in line with the GMP and HACCP standards will improve the quality of the food manufactured (Ramli et al., 2020).

Recently, JAKIM has enforced that the halal practice in premises need to be filed and documented for traceability and audit purposes. The Malaysian Halal Management System (JAKIM, 2020a) is published to be a reference for manufacturers to apply the Internal Halal Control System (IHCS) or Halal Assurance Syatem (HAS). The difference is that IHCS needs to be applied to micro and small industries, whereas HAS is implemented for medium and large companies. The role of Halal Executive in food industry is very crucial to carry out activities, such as shari'ah monitoring as well as assisting upper management in halal related matters. The hired Halal Professional Board, JAKIM (Rosli et al., 2022). Ahmad et al. (2018) had discussed and described that there are five components for an effective national halal food control system namely halal food legislation, halal food management control, halal inspection and enforcement, halal laboratory as well as halal information, education, communication and training. Meanwhile, Yildirim (2019) had

discussed the Malaysian Halal Certification involving the laws on criminal accountability and the action taken by Malaysia as a halal hub.

2.10.2.6 Food Safety Assurance Practices among Food Manufacturers in Malaysia

Food manufacturing companies in Malaysia are classified as micro, small, medium and large. In general, small and medium enterprises (SMEs) make up the largest portion of the food industry in the country. The size of manufacturing industry is determined by the number of full-time employees or the total annual revenues. Table 2.8 further shows the category of industry in Malaysia. In terms of food safety assurance system implementation, most food companies aim to gain legal, technical and financial benefits as well as fulfilling consumers demand in terms of product quality certifications (Kotsanopoulus and Arvanitoyannis, 2017; Havinga and Verbruggen, 2017). The benefits will also drive the SMEs in food industry to apply for product and system certifications (Guo et al., 2019).

Table 2.8
Categories of Industry in Malaysia

Category of Industry	Micro	Small	Medium	Large
Number of full-time employees	< 5	5 < 75	75 ≤ 200	> 200
Total Annual Revenue (RM)	< 300, 000	300,000 < 15 mil	15 mil ≤ 50 mil	> 50 mil

Source: SME Corporation Malaysia (2024)

According to Razzif and Norzaidi (2020a), despite the benefits gained, there are several challenges for the SMEs in food industry in Malaysia to implement and obtain the certifications such as high costs, language barrier and lack of motivation and knowledge in applying for the HACCP certification. Razzif and Norzaidi (2020b) reported that the HACCP-certified companies in Malaysia had increased by 29% from 2016 to 2017, while

in 2018, the number of HACCP-certified companies in Malaysia had increased by 11%. However, this figure is still insignificant in comparison to the total SMEs in food industry in Malaysia.

To date, there are 253 GMP-certified food companies, where 143 of them still have the certification in force, whereas out of 820 HACCP-certified food companies in Malaysia, 691 still have the certification in force (MOH, 2021). Besides, 5376 food companies in Malaysia have the Malaysian Halal Certification certified by JAKIM (2021). The data indicate that there is higher number of food companies that are aware of being halal-certified instead of gaining the GMP and HACCP certifications. In fact, the Malaysian standards for halal food (MS 1500: 2019; DSM 2019b) stipulates that the food manufacturers need to implement the standard according to GMP, GHP, HACCP and other local food regulations enforced by the authorities.

Furthermore, since Malaysia is a country with majority of its population is Muslims, it makes sense that there are many halal-certified food manufacturers. In addition, it gives advantage to Malaysia as a Muslim-friendly country. The research on food assurance system practices among food companies in Malaysia from 2016 to 2023 are listed in Table 2.9. The food assurance system involves halal, ISO 22000, GMP, GHP, MeSTI, HACCP, ISO 9001 and Total Quality Management (TQM).

Table 2.9
Studies on Food Assurance System among Food Manufacturers in Malaysia

Author & Year	Type of Food Assurance System	Methodology	Respondent	Result
Jalil et al. (2016)	GMP	Ethnographic Method	3 food and beverage companies in Malaysia.	There are some confusions prevailing in the industry and facilities for the first element of GMP system. This confusion extends from building materials, design and construction features and facilities.
Kim-Soon et al. (2017)	GMP, HACCP ISO 9001, TQM	Questionnaire by email	Small-size food manufacturing companies in Malaysia.	GMP scores the highest level of implementation among the small-size food manufacturing companies in Malaysia followed by halal integrity and organisational readiness.
Talib et al. (2017)	Halal	Questionnaire	210 halal certified food manufacturing companies in Malaysia.	Halal food certification has a positive relationship with operational performance which links to financial performance of the food companies.
Talib and Chin (2018)	Halal	Partial least squares structural equation modelling technique	210 halal-certified food manufacturers involving local manufacturer and multinational firms in Malaysia.	The internal factors on implementation of halal food standard are organisation's commitment, operational improvement and marketing functions, while the external factors are government intervention and consumer pressure.
Azmi et al. (2018)	Halal	E-mail survey	103 respondents from food companies in 15 states in Malaysia.	Business performance of halal manufacturer can be improved by the context of technological, organisational and environment.
Nuratifah et al. (2019)	Halal	Close ended questionnaire	Halal managers in 71 companies in Sabah.	The length of employment is an important factor for Halal Assurance System (HAS) knowledge level; ethnicity and product cluster are the influencing factors for halalan toyyiban practices level.

Azmi et al. (2019)	Halal	Five-point questionnaire	103 halal food manufacturers in 14 states in Malaysia.	There are three influence factors on food manufacturers' perception towards halal food supply chain primarily on expected business benefits followed by halal integrity and organisational readiness.
Kim-Soon et al. (2020)	GMP, GHP MeSTI, HACCP, ISO 9001 / ISO 22000, TQM	Questionnaire	306 food manufacturing companies in Malaysia.	Quality Management Practices are significantly related to the operational and market performance of the food manufacturing companies in Malaysia.
Razzif and Norzaidi (2020b)	HACCP	Questionnaire	Owners of SMEs of food companies in Malaysia.	The implementation of HACCP among SMEs of food companies are limited caused by insufficient technical resources, time, financial capability as well as lacking in knowledge and training.
Mansor and Daud (2020)	Halal	Questionnaire by mail	297 of Malay-owned SME companies in Malaysia.	There is significant relationship between entrepreneurial resources and organisational effectiveness and growth in halal food industries.
Mohamed et al. (2020)	Halal	Multiple linear regression	121 halal food industries in Malaysia	The halal supply chain of food and beverage industry as a significant effect on Halal Integrity Assurance.
Rashid and Bojei (2020)	Halal	Questionnaire	127 halal food and beverage companies in Malaysia.	The highest adoptions of halal traceability system are among the producer and end user; meanwhile economic and socio-cultural factors influence the halal industry environment factors the most.
Saiman and Yusma (2022)	Halal	Semi-structured interview	Higher officer of the Department of Islamic Development Malaysia (JAKIM).	The factors of Muslim entrepreneurs not interested to apply for Malaysia halal certification are comfortable with their Muslim status, perception that the application is complicated and the entrepreneurs do not meet minimum requirement for the application.
Kuan et al. (2023)	HACCP, GMP, MeSTI	QField geographic information system	4972 datasets of food factories in Malaysia obtained from	The MeSTI certification is the highest followed by HACCP and GMP respectively in all regions of Malaysia. The Penang state has the most HACCP

		(QGIS) application method.	Ministry of Health's Food Safety and Quality Division database.	certified companies in fish and fish product category, whereas Selangor is the highest for confectionery industry and Sabah for food service.
Xuan et al. (2023)	HACCP	Failure mode and effect analysis	Raw unclean edible bird's nest processing plant in Malaysia.	Two critical control points (CCPs) were identified namely heat treatment and moisture check of edible bird's nest.
Mabkhot (2023)	Halal	Partial least squares method	212 respondents from Malaysian halal-certified companies	Positive and significant impacts are noted on supply chain integration, health consciousness and process quality improvement on sustainable product performance in halal food industry in Malaysia.

2.11 Food Contamination Cases in Malaysia

A 2019 report by the Ministry of Health revealed that 21% of food poisoning incidents in Malaysia were attributed to food trucks, restaurants, and night markets, excluding those occurring in schools, institutions, private homes (Hanafi, Toolib, Zulkifle & Daud, 2021). This alarming statistic underscores the need for substantial and immediate actions to uphold food safety and hygiene standards across the country. Under the Prevention and Control of Infectious Diseases Act 1988, all cases of food poisoning and dysentery in Malaysia are mandatorily reportable (MOH, 2017). According to the World Health Organisation (WHO) and MOH, a food poisoning outbreak is defined as an event where two or more individuals exhibit symptoms linked to the consumption of a common food or meal, with a clear epidemiological connection by time, place or person (WHO, 2008; MOH 2017).

Despite the deep cultural significance of food in Malaysia, public awareness of food safety remains insufficient. As Ashok (2015) claimed, although Malaysians are passionate about their food, this enthusiasm does not extend to food safety, not due to lack of incidents but rather a lack of sufficient concern. A tragic example of this occurred in 1988, when boric acid and aflatoxin led to the deaths of numerous children. Disturbingly, boric acid contamination persisted in noodle samples as recently as 2008. This gap between awareness and action reflects a broader issue within the country.

Malaysia has established legal measures to regulate food safety and quality, yet food contamination continues to affect both commercial and informal sectors. Since 2008, many incidents have been reported by the media, drawing attention to ongoing shortcomings in food safety practices. These challenges are reflected in major cases such as the 1983 coconut milk related food poisoning, recognised as the first large scale outbreak in the country, and a more recent incident in Kedah where 21 people died after consuming chap fan or economy mixed

rice. These selected cases demonstrate the persistence and seriousness of food safety failures in Malaysia, as illustrated in Appendix 1.1.

2.12 Food Safety Culture

The concept of food safety culture has recently gained prominence as a framework for understanding food safety that extends beyond traditional food safety management systems. It encompasses the prevailing cultural attitudes towards food safety within an organisation as well as the influence of both internal and external environmental factors. A growing body of research has begun to explore food safety culture as a critical determinant in improving food safety performance (Griffith et al., 2010; Powell et al., 2011; Fatimah et al., 2014; De Boeck et al., 2015; Nyarugwe et al., 2018; Jespersen et al., 2017; Manning, 2018; Nayak & Taylor, 2018; Nyarugwe, 2020; De Andrade et al., 2020). Furthermore, the following Table 2.10 summarises differing perspectives on the definition of food safety culture within the food sector.

Table 2.10
Articulating the Concept of Food Safety Culture in Industrial Food Systems

Author (s)	Year	Definition of Food Safety Culture in Food Sector Practice
Griffith et al.	2010b	Food safety culture has been defined as the "aggregation of the prevailing, relatively constant, learned, shared attitudes, values and beliefs contributing to the hygiene behaviours used within a particular food handling environment".
De Boeck, Jacxsens, Bollaerts & Vlerick	2015	Employees' shared perceptions regarding leadership, communication, organisational commitment, resource allocation and risk awareness in relation to food safety and hygiene within their current workplace.
Nyarugwe et al.	2016	Food safety culture encompasses both individual attributes such as values, attitudes and behaviour with organisational elements such as communication practices, managerial approaches and infrastructural conditions.

Powell et al.	2011	A poor food safety culture has already been found to increase the risk of foodborne disease.
Emond and Taylor Griffith, Jackson and Lues Yiannas	2018 2017 2009	Food sectors have a keen interest in the concept of food safety culture to reduce the possible failures related to food safety.
De Boeck et al.	2016	It is unclear whether the interplay between food safety culture and food safety management system leads to high hygiene and safety; however, a good food safety culture is not adequately formed by the presence of a food safety management system only.
De Boeck et al.	2017	Food safety culture known as a positive relationship with employees' behaviour as performance output, while also serving as a mediating factor between their knowledge and actual practices.
De Boeck et al. Manning	2017 2018	Food safety culture refers to the shared values, beliefs and practices within an organisation that influence food safety behaviours and decision-making. In the food sector, high staff turnover often leads to inconsistencies in knowledge, experience, attitudes, behaviour and cultural backgrounds. Despite these challenges, such human factors are essential to building and sustaining a strong food safety culture.

Another widely cited definition comes from Yiannas (2009), who described food safety culture simply as "how an organisation or group does food safety" (Yiannas, 2009, p. 12). He distinguishes food safety culture from formal food safety management systems (FSMS) or employee knowledge of food safety procedures. Instead, he emphasises that organisational culture shapes how individuals perceive safety, approach safety-related decisions, and feel empowered to discuss concerns or differing views. According to Yiannas, a strong food safety culture is reflected when employees and leaders alike share similar values, beliefs, and attitudes about food safety (Yiannas, 2009; Ades et al., 2016; FDA, 2022). In such environments, employees are motivated to follow safety practices not out of obligation or supervision, but because they understand and believe in their importance even when no one is watching

(Yiannas, 2009; Wright et al., 2012; Ades et al., 2016). Yiannas (2009) summarised this mindset as: "the way we do things around here" (p. 12).

Other scholars have similarly highlighted that food safety culture is a shared construct across all levels of an organisation (Wright et al., 2012; Taylor, 2011; Bolano, 2020). For example, Wright, Leach, and Palmer (2012) and Taylor (2011) point to the influence of senior or experienced employees in shaping the behaviours of newer staff, especially through informal teaching of food safety norms. Bolano (2020) argues that definitions of food safety culture ought to encompass fundamental organisational components including "shared norms, practices and standards that influence behaviour" (Bolano, 2020, p.26). He further distinguishes between these elements : norms, values and beliefs are indicative of ethical considerations (for example, "It is wrong not to wash my hands"); practices denote habitual or automatic actions (for example, "I wash my hands without thinking"); and standards represent formalised expectations (for example, "The manual requires handwashing") (Bolano, 2020, p.25).

Building upon Schein's (2004) foundational work and the broader literature on safety culture, Griffith et al. (2010a) argued that food safety culture constitutes a distinct component of an organisation's overall culture, specifically oriented towards fostering safe food handling behaviours and practices. The authors propose a three-tiered model through which food safety culture may evolve within an organisational context. At the strategic level, senior management establishes core values and objectives that shape ethical norms and performance expectations related to food safety. At the managerial level, middle management evaluates the prevailing beliefs and attitudes that influence how food safety is perceived and enacted. Finally, at the operational level, cultural values are manifested in employees' behaviours and in the physical characteristics of the working environment, as articulated by Griffith et al. (2010a).

De Boeck et al. (2015) extend the discourse by introducing a complementary perspective that incorporates the concept of food safety climate. They define food safety climate as "employees' (shared) perception of leadership, communication, commitment, resource and risk awareness concerning food safety and hygiene within their current work organisation (De Boeck et al., 2015, p. 243). Within their framework, food safety management systems are characterised as a "techno-managerial route", reflecting the broader organisational context, technological infrastructure and process-related features. In contrast, food safety climate represents the "human route", encompassing the perceptions and attitudes of both employees and managers (De Boeck et al., 2015, p. 244). As such, food safety climate is conceptualised as a multidimensional construct that arises from the interaction between technical systems and human factors.

However, subsequent research by Sharman, Wallace, and Jespersen (2020) delineated critical distinctions between food safety culture and food safety climate, despite their conceptual overlaps. Food safety climate, according to their findings, pertains to transient perceptions and sentiments held at a specific point in time. In contrast, FSC encompasses the enduring values, assumptions, behaviours, and practices embedded within an organisation over time. As the authors articulate, "food safety climate is a temporary construct existing at the individual level, relating to the perception and attitudes of individuals and how they influence others within an organisation to adhere to the food safety management systems and practically apply these in the working environment" (Sharman et al., 2020, p. 16).

Another dimension in the literature underscores the bidirectional influence of FSC on organisational food safety outcomes (Griffith et al., 2010b). A positive FSC is characterised by an institutional commitment to food safety as a strategic objective and a demonstrable adherence to regulatory compliance. Conversely, a negative FSC typically driven by priorities misaligned with food safety creates systemic barriers to achieving compliance (Griffith et al.,

2010b). Nyarugwe, Linnemann, Nyanga, Fogliano, and Luning (2018) further refined this framework by proposing a tripartite typology: reactive, active, and proactive cultures. A reactive FSC responds only post to food safety failures; an active culture complies minimally without deeply internalising food safety imperatives; whereas a proactive FSC anticipates and mitigates risks pre-emptively (Nyarugwe et al., 2018). Complementing this, Jespersen et al. (2016) offer a developmental model portray five progressive stages of FSC maturation: (1) doubt, (2) react, (3) know, (4) predict, and (5) internalise. Less mature cultures question the legitimacy of prioritising food safety and act only under pressure, whereas more advanced stages reflect anticipatory behaviours and a deeply firm understanding of food safety as a core organisational value.

Jespersen, Griffiths, Maclaurin, Chapman, and Wallace (2016) similarly contend that the concept of food safety culture (FSC) is fundamentally informed by established organisational culture literature. However, their study extends this foundation by integrating insights from food science and social cognitive theory. The authors argue that while organisational structure exerts a profound influence on FSC, an exclusive focus on structural determinants is insufficient. They advocate for a concurrent consideration of the scientific principles that underpin food safety regulations (Jespersen et al., 2016). These assertions align with earlier studies by Griffith et al. (2010a; 2010b), who identified FSC as an "emerging risk factor" in the domain of food safety (Griffith et al., 2010a, p. 426), asserting that organisations should evaluate their FSC with the same rigour applied to raw material assessments, food handler behaviours, and microbiological hazards (Griffith, 2010b).

In the pursuit of cultivating and institutionalising a robust food safety culture (FSC), academic discourse has increasingly concentrated on identifying the critical determinants of food safety performance and on the development of diagnostic frameworks and evaluative instruments (Griffith et al., 2010b; Yiannas, 2009; Jespersen et al., 2016, 2017; Nyarugwe, 2016; Ball et

al., 2010; Neal et al., 2012; Wright et al., 2012; De Boeck et al., 2015, 2016; Watson et al., 2022). Despite these efforts, the concept of FSC remains theoretically and empirically underdeveloped. Notable gaps persist in the establishment of .a universally accepted definition, the identification and validation of key performance indicators, the integration of demographic and contextual variables, the standardisation of assessment methodologies and the extension of research into underrepresented domains, particularly home-based food producers.

This concern is especially pertinent in the Malaysian context, where homemade food businesses are increasingly prevalent yet remain underexamined in terms of food safety practices and culture. Studies have consistently demonstrated that the behaviour of food handlers is a pivotal factor in the prevention of foodborne illnesses (Griffith, 2013; Yiannas, 2009). Furthermore, their decision-making processes and attitudes are shaped by the prevailing food safety culture within their operational environment (De Boeck et al., 2016, 2017; Griffith et al., 2010b; Taylor, 2011; Yiannas, 2009). Consequently, the objective and contextually appropriate assessment of FSC is essential for its enhancement within food industry settings (Jespersen et al., 2017; Nayak & Waterson, 2016; Powell et al., 2013). It is equally important that food handlers in the food sector including those operating from home fostering a positive food safety culture to promote and sustain safe food handling practices. Nonetheless, empirical evaluations of FSC within this sector remain limited (Neal et al., 2012; Ungku Fatimah et al., 2014). Furthermore, although national cultural dimensions may influence organisational safety culture (Noort et al., 2016), there is a notable absence of empirical research on FSC in Asian contexts including countries such as Malaysia, Japan Korea and China.

2.13 Conceptual Distinction Between Food Safety Culture, Food Safety Climate, Governance, Compliance and Competence

Although food safety culture, food safety climate, governance, compliance and competence are closely related, they represent distinct constructs. Conceptual overlap, particularly between food safety culture and food safety climate, has been recognised in the literature (Sharman et al., 2020). In this study, the constructs are therefore distinguished according to their primary focus and level of analysis to strengthen the theoretical clarity of the governance of homemade food producers in Malaysia.

Food safety culture refers to the shared values, beliefs, assumptions and behavioural norms through which food safety is understood and enacted within a food production environment. It extends beyond formal procedures by influencing how food safety is prioritised in everyday practice (Griffith et al., 2010b; Yiannas, 2009; Nyarugwe et al., 2016). In this study, food safety culture is understood as the relatively enduring collective values, beliefs, norms and practices surrounding food safety.

Food safety climate, in contrast, concerns individuals' or groups' current perceptions of the food safety environment, including perceptions of commitment, communication, training, resources and priorities. It is therefore more proximal, perceptual and changeable than food safety culture (De Boeck et al., 2015; Sharman et al., 2020). Thus, culture concerns relatively embedded collective values and practices, whereas climate concerns how food safety is currently perceived within the food-producing environment.

Food safety governance operates at the broader institutional level and refers to the regulatory frameworks, institutions, policies and oversight mechanisms through which food safety responsibilities are established, coordinated and monitored. Governance forms part of the external environment influencing food safety culture and practice (Nyarugwe et al., 2020). In Malaysia, this includes the Food Act 1983, Food Regulations 1985 and Food Hygiene

Regulations 2009, together with regulatory activities undertaken by the Ministry of Health and relevant agencies. Governance therefore provides the institutional and regulatory context within which food safety expectations and accountability are established.

Food safety compliance refers to the extent to which food producers adhere to applicable food safety regulations, standards and operational requirements. It is primarily concerned whether prescribed requirements are followed and can therefore be reflected in observable practices (Manning, 2020). Compliance may result from regulatory requirements, monitoring or other external pressures and does not necessarily indicate that food safety values have been fully internalised. Conversely, food safety culture may support consistent compliance when food safety requirements become embedded in routine practices (Griffith et al., 2010b; Nyarugwe et al., 2020). Compliance therefore concerns adherence to requirements, whereas culture concerns the underlying values and norms shaping food safety behaviour.

Competence refers to the knowledge, skills, abilities and experience required to perform food safety tasks effectively. It enables food producers to understand hazards and apply appropriate control measures. However, competence is distinct from compliance and culture because possessing knowledge and skills does not necessarily result in consistent food safety behaviour (Mortier et al., 2017). In this study, competence is therefore treated as an individual capability enabling the effective implementation of food safety practices.

Taken together, governance represents the institutional and regulatory framework; food safety culture represents shared and relatively enduring values and practices; food safety climate represents current perceptions of the food safety environment; competence represents the capability to implement food safety practices; and compliance represents adherence to established requirements. These constructs are therefore interconnected but conceptually distinct, as summarised in table 2.11. This distinction is particularly relevant to homemade food

producers, where regulatory requirements, individual capability and informal food safety practices may operate simultaneously.

Table 2.11
Conceptual Distinctions Between Food Safety Culture, Food Safety Climate, Governance, Compliance and Competence

Construct	Primary focus	Level of analysis	Main question addressed	Nature of construct	Example in a homemade food business
Food Safety Culture	Shared values, beliefs, norms and practices regarding food safety	Collective / food-producing environment	*How do we collectively understand, value and practise food safety?*	Relatively enduring	Food safety is routinely prioritised and incorporated into everyday decision-making and practices, even when direct monitoring is absent.
Food Safety Climate	Current perceptions of the food safety environment	Individual / group	*How is food safety currently perceived within the business?*	More proximal and changeable	The producer perceives that food safety is currently given high priority because food safety issues are regularly discussed and reinforced.
Governance	Policies, regulations, institutions, oversight and enforcement mechanisms	Institutional / regulatory	*How is food safety regulated, coordinated and monitored?*	Formal institutional framework	Requirements established and enforced through Malaysian food safety legislation and relevant regulatory authorities.
Compliance	Adherence to food safety requirements and standards	Individual / behavioural	*Are applicable food safety requirements being followed?*	Observable adherence / behaviour	The producer follows applicable food hygiene requirements and other relevant

					regulatory or operational requirements.
Competence	Knowledge, skills, abilities and capacity to perform food safety tasks	Individual	*Does the producer have the capability to perform food safety tasks correctly?*	Capability / enabling capacity	The producer understands cross-contamination risks and correctly applies appropriate food handling and temperature-control practices.

2.14 Review of Food Safety Culture Model

As the field of food safety culture has developed, numerous scholars have proposed models and frameworks that identify key factors, components or dimensions. These are frequently underpinned by broader theoretical constructs including organisational culture, safety culture and behaviour change. Most prominently, many of these models also highlight challenges similar to those outlined in Section 2.10.1 particularly those that impede the effective implementation of Food Safety Management Systems (FSMSs). This is exemplified by the identification of five evidence-based models through the literature review (Wright et al., 2012; Denison et al., 2012; Ball et al., 2009; De Boeck et al., 2015; 2016; Jespersen et al., 2016; 2017), along with three commercially oriented frameworks (Taylor et al., 2015; CEB, 2013; NSF, 2016). In addition, several scholars have investigated specific cultural factors or indicators that may influence an organisation's food safety performance (Yiannas, 2009; Hinsz et al., 2007; Neal et al., 2012; Griffith et al., 2010b; Fatimah et al., 2014b; Nyarugwe et al., 2016; Zabukosek et al., 2016). `

Analysis of the existing body of literature led to the identification of eight key factors commonly regarded as dimensions of food safety culture, namely, leadership, commitment,

communication, competence, environmental influences, adaptability, consistency and risk awareness. Nevertheless, this research employs the Enlightened Food Safety Culture Model (EFSCM), introduced by Watson et al. (2020) and adapted from their earlier framework (2018), to explore the conceptual gap between management and frontline staff in their interpretation and application of food safety culture. The EFSCM was chosen for its distinctive focus on diagnosing exotropia food cultures, thereby offering a novel perspective within the broader academic and industry discourse on food safety. The model is premised on the idea that when food safety culture is no longer within the organisation's field of vision (Yewon et al., 2017), it may develop a separate identity (Ades et al., 2016). Often, it takes a major non-compliance event to trigger awareness that existing policies and cultural practices require realignment. This misalignment is typically the result of a gradual divergence in employee behaviour from the organisation's intended food safety strategy. EFSCM outlines four key thematic areas, namely, Control, Co-operation, Communication and Competence. Each supported by specific elements and indicators that collectively define a robust food safety culture. The subsequent sections will explore each of these themes in depth, considering how they have been interpreted within the existing body of literature.

2.14.1 Control

Control plays a pivotal role in aligning an organisation's food safety culture and in coordinating operational procedures that impact food safety outcomes. Strategy, leadership, process and change are recognised as key indicators of organisational control. Among these, strategy articulates the organisation's core commitments and priorities concerning food safety culture (Global Food Safety Initiative, 2019; PricewaterhouseCoopers, 2018). Effective leadership plays a pivotal role in shaping and sustaining an organisation's food safety culture as it enhances both productivity and responsiveness within the organisation (Griffith et al., 2010;

Zin and Ismail, 2012). For instance, Yiannas (2009), Griffith et al. (2010b), De Boeck et al. (2015) and Schein (2016) revealed that leadership is widely recognised as a key driver of food safety culture, primarily due to its role in embedding values and expectations that shape daily practices. Leadership plays a central role in engaging personnel and ensuring adherence to hygiene and safety standards, thereby supporting the achievement of organisational objectives including its overarching goals, mission and vision as discussed in Section 2.11 (Griffith, Livesey and Clayton, 2010b). These authors asserted that leaders are tasked not only with setting performance targets but also with expressing the organisation's food safety vision, projecting future standards and encouraging employee commitment to these aims. The established standards then serve as benchmarks for evaluating performance in food safety. Furthermore, the consistent reinforcement of correct behaviours across all organisational level, from leadership to frontline employees is central to achieving food safety, as outlined in NSF International's Maturity Model (2016). This model identified five generational stages namely Control, Compliance, Commitment, Collaboration and Corporate DNA which serves as a strategic tool for embedding food safety into the organisation's core operations.

Leadership is consistently positioned as a foundational element in models of food safety culture. De Boeck et al. (2015) identified leadership as the core component of their food safety climate model, highlighting its role in setting hygiene expectations, responding to employee feedback and promoting safe behaviours. Similarly, Yiannas (2009) placed leadership "at the top" of his five essential elements for a strong food safety culture, defining it as the function that articulates a vision, encourages safe practices and fosters engagement across the organisation. This strategic role is further reinforced by Denison's organisational culture model (Denison et al., 2003; 2012) where leadership is embedded within the 'mission' trait, reflecting long-term goals, strategic direction and consistency. In this framework, leaders are expected to

communicate a compelling yet achievable vision that aligns with organisational purpose and motivates collective action.

Jespersen, Griffith and Wallace (2017a) synthesised insights from eight food safety culture models to develop a framework comprising five dimensions: values and mission, people systems, risk consciousness, consistency and adaptability. Jespersen et al. (2018) further clarified that the "values and mission" dimension aligns closely with leadership, highlighting its role in controlling strategic direction, motivating employees and positioning food safety as a core organisational priority. Ball, Wilcock and Aung (2010) echoed this leadership – mission link in their socio-psychological model, which illustrates how leaders introduce food safety policies aligned with strategic goals. Their framework demonstrates that leadership influences employee performance through supervision, feedback, visible commitment to FSMS and the integration of safety practices into daily routine.

Wright Leach and Palmer (2012), through a toolkit developed for the UK Food Standards Agency identified leadership-driven mission elements in small and medium-sized enterprises (SMEs). These included setting priorities, recognising risks, taking ownership and visibly promoting hygiene improvements which reflect a leadership style embedded in the organisation's food safety direction. The literature consistently highlights the strategic importance of leadership in cultivating a robust food safety culture. Leaders are instrumental in shaping organisational purposes, setting clear expectations and ensuring that stated values are reflected in routine practices (Jespersen et al., 2018).

Nonetheless, leadership's role extends beyond setting policy, it must be visible, active, and action oriented. As highlighted by GFSI (2018), policies alone are insufficient; they must be supported by genuine leadership engagement at all organisational levels. This means leader must be seen controlling food safety activities not just issuing memos or setting expectations from a distance (Gmunder & Cunningham, 2018; Griffith et al., NSF, 2016). Numerous

empirical research have demonstrated that when leaders exemplify the expected behaviours and actively control and monitor in food safety procedures, employees are more inclined to adopt and maintain safe practices (Arendt & Sneed, 2008; Griffith, 2010; Arendt et al., 2011; Neal et al., 2012; Fatimah et al., 2014a; Andrade et al., 2020). Similarly, the study conducted by Khairul Effendi et al. (2022) that focused on the food safety of homemade food producers in Malaysia showed that food prepared by home-based producers is difficult to control or monitor, highlighting the need for regulatory compliance including licensing, vaccinations and food safety training. The authors also stressed that hygiene must be upheld regardless of the food preparation setting.

While the outcome of the research by Akabanda et al. (2017), which focused on food safety knowledge, attitude and practices of institutional food handlers in Ghana revealed a lack of organisational structure in food safety management including the absence of a clear vision, specific safety goals and a formal FSMS. These shortcomings were reflected in poor hygiene practices such as distributing unpackaged food without gloves and failing to wear protective clothing or use appropriate sanitising methods. In Malaysia, the classification of micro (fewer than 5 full-time employees) and small (5 to fewer than 50) encompasses many home-based food businesses (Fernando et al. 2014). These businesses are typically led by a single owner who exercises full control over operations and bears the primary responsibility for ensuring that food safety regulations are followed by all employees, thereby ensuring the hygienic preparation and safe handling of food until it reaches consumers (Government of Alberta, 2020). To foster a culture of food safety, leaders must visibly acknowledge prevailing safety concerns and empower employees with the means and motivation to learn from their mistakes and appreciate the significance of safe practices (Schein, 2004; Zanin et al., 2021). Greater alignment between managerial and employee perspectives on safety issues enhances the

likelihood of positive behavioural change, whereby employees regard safe food as advantageous for both the organisation and its customers (Griffith et al., 2010b).

Despite leaders often having genuine intentions to promote food safety, their behaviours may at times contradict the messages they aim to convey to employees (Corporate Excecutive Committee (CEB)), 2013. To exemplify this, Fatimah et al. (2014b) exposed that part-time employees demonstrated more favourable attitudes towards various dimensions of food safety culture namely leadership, communication, management style, environmental support, teamwork, accountability and work pressure compared to their full-time counterparts apart from self-commitment and risk judgement. These differences in perception may be attributed to part-time workers' limited exposure to or awareness of organisational food safety protocols (Fatimah et al., 2014b). Supporting this, Ferber and Waldfogel (1998) observed that many individuals in part-time roles intentionally reduce their engagement with their employing organisations often due to competing interests or time constraints. Nevertheless, the GFSI (2018) emphasised that effective communication of food safety culture must extend from leadership to all personnel including full-time, part-time, temporary staff and external partners through diverse and regularly updated communication channels to ensure messages remain relevant and salient. Similarly, CEB (2013) proposed a model for assessing organisational quality culture, identifying four key drivers of leadership emphasis, message credibility, peer engagement and employee ownership. This model underscores the importance of trust-based communication, the periodic renewal of key messages and the incorporation of employee feedback to maintain message relevance and impact.

Previous research has underscored the pivotal role of leadership in securing managerial commitment to food safety (Ball et al., 2010; 2016). Ball et al. (2010) emphasised that such commitment extends beyond financial investment, encompassing the active engagement of leader in supporting and involvement in the implementation and maintenance of FSMSs.

Similarly, Neal, Binkley and Henroid (2012). Employing a food safety climate assessment tool demonstrated that effective control by leader ensures food safety remains a daily operational priority. Their findings indicated that leader consistently monitored staff performance even during peak periods, provided appropriate resources and modelled desired behaviours through their own actions. In this way, leadearship commitment emerges as a critical influence on employee conduct and a key driver in cultivating a robust food safety culture. Although leadership and management differ in scope and emphasis, both are essential to enhancing employee performance. Yiannas (2009) describes leadership as the capacity to influence individuals, in contrast to management which focuses on control and the delivery of predictable results. The behaviour of employees or staff is frequently shaped by managers whose authentic commitment is reflected in routine practices. Therefore, leadership serves to inspire while management ensures adherence to established system (Maxwell, 1998).

Recent academic literature on leadership and management in small-scale food businesses, including those based at home, underscores the relevance of responsible leadership (RL) practices that respond to the sector's unique operational and ethical demands. Moving beyond conventional leadership-management dichotomies, current studies advocate for an integrated approach that includes ethical integrity, social responsibility, stakeholder participation, shared decision-making, and environmental mindfulness (Fleming, 2022; Waldman et al., 2020). Elkhwesky et al. (2022) demonstrate that RL practices especially those centred on ethical behaviour and societal orientation are instrumental in improving both financial outcomes and innovation within small and medium-sized restaurant businesses, which often include home-based businesses (Mousa, 2018; Voegtlin, 2016). These practices demand that business owners and managers consider the wider social and ethical implications of their decisions (Liu and Lin, 2018; Voegtlin et al, 2015). Power-sharing, involving the active participation of staff in decision-making, is also highlighted as a key enabler of adaptability and teamwork (Cheng et

al., 2019; Javed et al., 2020a; Liao and Zhang., 2020; Rui and Lu (2020). The findings further suggest that leadership in home-based food businesses must go beyond operational control to include the development of trust, openness and ethical commitment across all levels of the organisation (Huang et al., 2016; Kaya and Karatepe, 2020; Saleem et al., 2020). Such a comprehensive leadership model is essential for fostering innovation, ensuring long-term viability, and sustaining a strong reputation in a competitive market (Elkhwesky *et al.*, 2022). Despite the recognised importance of leadership, numerous barriers may impede employee adherence to food safety protocols. These include excessive workloads, time constraints, inadequate facilities, insufficient accountability, limited training opportunities, and weak managerial support. Such factors can diminish staff motivation and contribute to a deficient food safety culture (De Boeck et al., 2016; Fatimah et al., 2014b; Zabukosek et al., 2016; Nyarugwe et al., 2016; Lee et al., 2013; Bas et al., 2006; Jha, 2015; Nayak & Waterson, 2017). These challenges are consistent with those identified in the literature on FSMS implementation (see Section 2.10.1).

To nurture a positive and enduring food safety culture, it is essential that employees comprehend the significance of food safety and are intrinsically motivated to engage with it. Concurrently, leaders and managers must cultivate a work environment that facilitates such engagement without relying on excessive supervision or coercion (Jespersen et al., 2016). Incentive and recognition schemes have been shown to be effective in enhancing staff motivation (Gmunder & Cunningham, 2018). When employees perceive their contributions as valued and aligned with organisational objectives, they are more likely to remain engaged (Jespersen et al., 2016). Ultimately, organisational success is driven by people rather than policies alone. Recognising employee efforts not only promotes hygienic practices but also strengthens team cohesion (Sharman et al., 2020; Roth & Clinton, 2004).

Accordingly, leaders bear responsibility for the implementation of policies and systems that promote consistent food safety practices throughout the organisation (Wilcock et al., 2011). This includes providing regular feedback; both affirmative and corrective to fostering a culture in which errors are viewed as learning opportunities and instituting individual or team-based recognition initiatives (Emond et al., 2018).

2.14.2 Co-operation

Co-operation to food safety is consistently recognised in the literature as a vital component in shaping and sustaining a strong food safety culture (FSC) within organisations (e.g., Griffith et al., 2010b; Yiannas, 2009; Ades et al., 2016; Powell et al., 2011). For example, Ades, Leith, and Leith (2016) emphasised that true co-operation exists when employees at all levels are fully dedicated to ensuring food safety throughout the entire supply chain from production to distribution so that consumers face the lowest possible risk of illness. Powell et al. (2011) similarly found that organisations with a positive FSC demonstrate their co-operation through daily efforts to reduce risk. Others argue that co-operation should be reflected in an organisation's core values, mission, and vision statements, which must be regularly reviewed and updated to remain meaningful (Yiannas, 2009; Griffith et al., 2010b).

Although cooperation and commitment are related concepts, they are not synonymous (Castañer and Oliveira, 2020; Abu Orabi et al., 2024). Commitment refers to a strong sense of dedication or obligation to a particular cause, task or relationship whereas cooperation involves working collaboratively with others towards a shared objective (Abu Orabi et al., 2024). Notably, effective cooperation often requires a degree of commitment (Castañer and Oliveira, 2020). Hence, Organisational commitment has been broadly categorised into three types: affective, continuance, and normative (Allen & Meyer, 1990). These categories help explain the diverse reasons why employees remain with an organisation (Meyer & Allen, 1997;

Camilleri, 2002; Greenberg & Baron, 2008; Mowday, 1998). Affective commitment refers to employees who stay because they identify with the organisation's values and support its goals. Continuance commitment is driven by the costs associated with leaving such as losing benefits or job security (Shaw et al., 2003; Johnson & Chang, 2006). Normative commitment involves a sense of moral obligation to remain, often influenced by cultural or family expectations, or loyalty instilled by the workplace environment (Dwahan & Mulla, 2012; Radosavljević et al., 2017).

Griffith et al. (2010b) applied these concepts to food safety, linking employee commitment directly to food safety behaviour. They observed that affective commitment in this context reflects an employee's emotional engagement with food safety goals; continuance commitment reflects staying due to a lack of alternatives; and normative commitment results from external expectations or pressure. Importantly, these forms of commitment are not mutually exclusive and may be shaped by factors such as personal circumstances, job characteristics, organisational climate, and leadership (Sharman et al., 2020). Leadership plays a key role in shaping and reinforcing commitment across all levels of the organisation (e.g., Wright et al., 2012; De Boeck et al., 2015; Jespersen et al., 2016; NSF, 2016). De Boeck et al. (2015) suggested that leaders demonstrate commitment by modelling good practices and responding decisively to food safety concerns. Griffith et al. (2010b) further defined food safety commitment as the extent to which employees feel their values align with the organisation's food safety principles. They argued that leadership's role in driving this commitment is more critical than cost-saving or productivity alone as it involves motivating employees, setting clear goals, and recognising safe behaviours. Supporting this, Clark, Crandall, and Reynolds (2019) found that visible leadership commitment can directly influence behaviours such as hand hygiene compliance.

Nonetheless, inconsistent messaging from management can undermine trust and weaken FSC. For instance, when managers encourage shortcuts that compromise food safety, employees may become confused or demotivated (Ball et al., 2010; Yiannas, 2009). A leader who neglects basic hygiene practices cannot reasonably expect staff to behave differently. In contrast, employees are more likely to follow food safety procedures when they observe their supervisors doing the same (Arendt et al., 2011). Moreover, food safety personnel tasked with monitoring may lack the authority to correct noncompliance, which can reduce the effectiveness of training and oversight (Ball et al., 2010). Hence, reinforcing food safety through supervision, paired with recognition and incentive strategies, can help build stronger behavioural norms (Ball et al., 2010). Still, as Taylor et al. (2015) noted, the true test of commitment is seen in how individuals behave when they are not being directly monitored.

Recognition and appreciation have also been linked to improved food safety behaviours (Taylor, 2011; Watson et al., 2018; Jespersen et al., 2016). Yiannas (2009) argued that both informal praise and formal systems, like badges or reward cards can positively reinforce desired behaviours. Financial incentives may also motivate employees, but research warns that over-reliance on such mechanisms can limit long-term cultural growth (Taylor, 2011; Richter & Koch, 2004). For example, financial rewards may improve short-term compliance but do little to foster lasting engagement or peer support. In a study by Caccamo et al. (2018), employees in a five-star hotel reported that while senior management offered general praise, they rarely acknowledged specific food safety efforts, which led to changes in the organisation's reward strategies to better support FSC.

Teamwork and knowledge-sharing are additional drivers of commitment and co-operation. Employees are more likely to embrace an FSMS when they feel involved, appreciated, and supported by both managers and colleagues (Jespersen et al., 2016; Manning, 2017; Fatimah et al., 2014b). In Clayton and Griffith's (2008) study, caterers were more influenced by peer

suggestions than by formal authority figures like managers or health inspectors. Similarly, Caccamo et al. (2018) observed that HACCP systems promote strong interdepartmental collaboration, which enhances teamwork and reinforces commitment. Ball et al. (2010) found that a unit's collective commitment to food safety significantly influenced individual behaviour. This influence can be both constructive and detrimental. On the positive side, new staff are more likely to adopt safe practices when those around them model appropriate behaviour. On the negative side, they may abandon safe habits if their peers ignore them. Supporting this, Fatimah, Strohbehn and Arendt (2014b) showed that new employees tend to start out positively, especially when supported through onboarding programmes and peer guidance. Over time, this early support plays a crucial role in maintaining their adherence to food safety standards.

In addition to the factors previously discussed, the management style adopted within an organisation plays a critical role in shaping employee commitment and cooperation with food safety practices (Watson et al., 2018; Griffith et al., 2010b; Pandi & Watson, 2018; Greenberg and Baron, 2008). This is further supported by Watson et al. (2018), who, in their research of UK food manufacturers, proposed a framework for food safety culture compliance based on four key pillars: control, co-operation, communication and competence as shown in Table 2.11 . These elements are closely aligned with the context of the present study. Their findings revealed that, although management or leader often expressed support for participatory approaches such as involving employees in HACCP teams and toolbox discussions; operational pressures frequently resulted in more autocratic leadership behaviours. In such instances, employees were more likely to comply with managerial directives to avoid conflict, rather than out of genuine engagement or understanding (Watson et al., 2018).

Table 2.12
The Enlightened Model / Framework of Food Safety Culture

Key Themes	Core Elements	Key Indicators
Control	Strategy	The strategic and operational framework to embed and integrate food safety.
	Leadership	Inspirational leadership to champion food safety compliance.
	Process	Proactive and responsive attitude towards food safety processes and issues.
	Change	Food safety reporting is used to support a food safety change agent.
Co-operation	Responsibility	Ensuring all employees recognise and appreciate food safety responsibilities.
	Empowerment	Empowering employees to actively participate in food safety.
	Teams	Motivating team dynamics to facilitate food safety.
	Recognition	Providing recognition to capture and promote food safety compliance / best practice.
Communication	Vision	Embedding the importance of food safety within the organisational vision.
	Norms	Fostering food safety social norms.
	Consistency	The level of consistency and agreement in food safety.
	Feedback	Actively encourage reporting of food safety issues.
Competence	Training	Resourcing effective training and repeat food safety training programmes.
	Appraisal	Promoting and evaluating food safety.
	Development	Adopting food safety within the company belief system.
	Self-belief	Food safety roles and responsibilities are clearly defined.

This discrepancy highlights the potential damage of working in environments perceived as oppressive or demotivating. Motarjemi (2014) warned that such settings can discourage employees from reporting problems, thereby hindering early detection and timely intervention. The issue is further exacerbated when senior leaders fail to address poor managerial practices, instead reinforcing harmful power dynamics (De Boeck et al., 2015).

Griffith et al. (2010b) drew attention to two distinct leadership styles, transactional and transformational. Transactional leadership focuses on compliance through goal setting, performance evaluation, and rewards or penalties, while transformational leadership emphasizes a broader organisational vision, motivating teams through empowerment and

shared purpose. Importantly, Griffith et al. (2010b) concluded that effective leaders often adapt their style depending on the context, shifting between approaches based on the situation and the individuals involved. This flexible leadership model was echoed by Pandi and Watson (2018), whose research in the Greek confectionery industry found that managers often adopted mixed styles, being strict when necessary but also recognising and rewarding employee contributions and acting as role models to foster trust and motivation.

From the employees' perspective, a supportive management style is closely tied to job satisfaction and perceived purpose. When roles and expectations are clearly communicated, employees are more likely to feel that their work aligns with organisational goals. However, a lack of clarity around job responsibilities, especially concerning food safety, can lead to confusion, role conflict, and implementation errors (Motarjemi, 2014). Ball et al. (2010) found that factors such as adequate training, access to facilities, supportive supervision, and managerial commitment all influence whether employees adhere to food safety practices.

Despite this, there remains a disconnect between ideal and actual management practices. For instance, Worsfold and Griffith (2010) found that 30% of managers failed to provide performance feedback, and only half of those surveyed offered recognition for hygienic practices. When food safety breaches occur, managers may resort to punitive responses such as warnings or dismissals rather than supportive interventions (Griffith et al., 2017; Yiannas, 2009). While punishment can deter undesirable behaviour, it can also foster fear and resentment, particularly when used in place of consistent leadership and engagement.

Beyond managerial influence, individual commitment to food safety is another vital element in building a strong FSC. Personal accountability encourages employees to meet both individual and team-based food safety goals, thereby improving operational efficiency (Neal et al., 2012; Zabukosek et al., 2016; Fatimah et al., 2014b). Neal et al. (2012) observed that employees who viewed food safety as a personal responsibility such as by consistently washing

hands or using gloves correctly demonstrated stronger commitment to protecting consumer wellbeing. Similarly, Arendt, Strohbehn and Jun (2015) found that workers who empathised with consumers or "put themselves in the customer's shoes" were more likely to follow food safety protocols. Fatimah et al. (2014b) also reported that self-commitment ranked highly among food service employees, regardless of demographic factors. Zabukosek, Jevsnik, and Maletic (2016) reinforced this finding in a study of a medium-sized food enterprise, where employee engagement and self-commitment received the highest scores in assessments of FSC. Nevertheless, high levels of individual responsibility do not always translate into consistent behaviour. Studies employing both observation and self-reporting have documented various instances where employees failed to follow safety procedures (Clayton et al., 2002; Strohbehn et al., 2008; Arendt et al., 2015). According to Reason (1995), deviations from safe practices may be the result of systemic management failures rather than intentional neglect. These failures can include inadequate infrastructure (e.g., inaccessible handwashing stations), time pressure, insufficient training, or poor communication of expectations (Motarjemi, 2014; Strohbehn et al., 2008; Lee et al., 2013). Employees may also be discouraged by witnessing managers ignore protocols or by sensing a lack of genuine concern from leadership (Clayton et al., 2002; Ball et al., 2010; Yiannas, 2009).

Moreover, an employee's working environment plays a pivotal role in shaping motivation and job satisfaction. If tasks are poorly communicated, roles are unclear, or if staff are frequently overburdened, stress and dissatisfaction are likely to emerge (Reason, 1995; Lane et al., 2010). Tharmin (2012) argued that low job satisfaction is often associated with higher turnover intentions, increased stress, and physical or psychological health problems. Research outside the food sector supports this view. For instance, Idris and Dollard (2011) found that poor working conditions often lead to stress, particularly when employees perceive an imbalance between effort and reward. This stress can have a direct negative impact on mental health

including burnout (Idris et al., 2014). These findings are also pertinent to the food sector including home-based food businesses. Arandjelovic, Ilic and Jovic (2010) reported high levels of burnout among workers in Serbian food manufacturing, while Zopiatis and Orphanides (2009) found that approximately one in three employees in the food and beverage sector experienced significant occupational burnout. Collectively, these findings highlight the intricate relationship between management style, organisational context as well as individual commitment and co-operation in the development and maintenance of a robust food safety culture. Effective leadership must be adaptable, supportive and communicative while organisational systems should be designed to promote personal accountability and safeguard the psychological well-being of food handlers.

2.14.3 Communication

Griffith et al. (2010b) define food safety communication as the extent to which knowledge and messages related to food safety are effectively transmitted among managers, supervisors, and food handlers. Similarly, Fatimah et al. (2014b) describe communication as the quality of message exchange, not only between management and frontline employees but also among co-workers, thereby highlighting its multidirectional nature. The importance of communication in shaping and sustaining a strong food safety culture (FSC) has been widely acknowledged across both academic and professional domains (TSI et al., 2015; Yiannas, 2009; Wright et al., 2012; Ball et al., 2010; De Boeck et al., 2015; CEB, 2013; Nyaruqwe et al., 2017; Caccamo et al., 2018; Zabukosek et al., 2016; NSF, 2016; Jespersen et al., 2017). However, Denison et al. (2012) and Neal et al. (2012) do not treat communication as a distinct construct within FSC frameworks, suggesting a divergence in how its role is conceptualised. This inconsistency in literature underscores the need for a more unified understanding of communication's function within food safety culture.

Griffith et al. (2010b) argue that high-quality Leader-Member Exchange (LMX) environments foster upward communication, enabling employees to raise food safety concerns with their superiors and thereby enhancing organisational transparency and the broader food safety climate. In the same vein, De Boeck et al. (2015) highlights that strong LMX relationships help clarify employees' roles and responsibilities, as leaders actively reinforce hygiene and safety expectations. The concept of LMX has been central to understanding how communication shapes leader-subordinate dynamics, which are widely recognised as integral to organisational culture. According to Erdogan and Bauer (2015), LMX theory posits that leaders influence subordinates by cultivating relationships grounded in mutual trust, respect, and reciprocal obligation; a view originally advanced by Graen and Uhl-Bien (1995).

Such relationships are typically characterised by openness, accountability, and shared values, all of which contribute to a stronger commitment to safety practices (Hofmann & Morgenson, 1999; Vogelgesang et al., 2013). Conversely, when LMX quality is low, communication may be marked by distrust, disengagement, or even hostility. Brown et al. (2019) suggest that such breakdowns often stem from hierarchical imbalances, conflicting perspectives, or interpersonal barriers such as anxiety or reluctance to speak up. Under these conditions, even well-crafted organisational messages may fail to resonate if not delivered by credible and relatable figures (Srinivasan & Kurey, 2014). As Hofmann and Morgenson (1999) emphasise, employees must feel assured that their concerns will be acknowledged and addressed in a respectful and constructive manner.

Effective communication remains a cornerstone of organisational success, yet many organisations continue to struggle with delivering complex and multidimensional objectives. This is particularly evident in the context of food safety, where the choice of communication channels can significantly influence the success of safety initiatives. As Brown et al. (2019) emphasise, selecting appropriate channels is not merely a logistical decision but a strategic one.

Communication mechanisms, including both formal and informal have been shown to enhance organisational satisfaction and performance (Ali & Haider, 2012; Carriere & Bourque, 2009). These may include written formats such as newsletters and reports, oral exchanges like meetings and face-to-face discussions, and digital tools including emails, SMS, and social media (Vredenburgh, 2002; Caccamo et al., 2018; Yates, 2006; Lear et al., 2015). Visual communication also plays a vital role. Signage, symbols, and slogans are frequently used to reinforce key food safety messages (Yiannas, 2009; De Boeck et al., 2015; CEB, 2013). According to Yiannas (2009), the use of multiple, complementary channels not only broadens message reach but also signals that food safety is a strategic priority embedded in the organisation's culture.

However, the effectiveness of communication depends not only on the medium but also on how well it resonates with the audience. Misalignment between communication style and employee preferences can lead to confusion or disengagement (Crampton et al., 1998; Gomez & Dailey, 2017). Behavioural research suggests that messages lacking specificity or behavioural clarity often result in poor performance outcomes (Yiannas, 2009). As Taylor et al. (2011) argue, communication must be tailored to the task, culturally appropriate, and accessible in terms of language and cognitive load. Refreshing messages regularly is also essential to avoid desensitisation and maintain engagement (Yiannas, 2009). Arendt, Paez, and Strohbehn (2011) found that even when managers possess strong food safety knowledge, their inability to communicate effectively can undermine safety outcomes.

Dialogue within the workplace offers more than just information exchange as it fosters trust and collaboration. Yiannas (2009) notes that problem-solving discussions can boost motivation and productivity. Open communication policies, as Fatimah et al. (2014b) explain, create a feedback loop that encourages employees to voice concerns. Caccamo et al. (2018) observed that when senior leaders consistently reinforce open-door policies, employees feel empowered

to speak up without fear of reprisal. This culture of openness, according to Ball et al. (2010) and Wright et al. (2012), supports critical reflection and innovation in food safety practices. Yet, communication alone is insufficient if feedback is not systematically captured and acted upon. The absence of formal mechanisms to integrate employee input into organisational learning remains a persistent barrier (Watson et al., 2018; Barry & Fulmer, 2004; Griffith et al., 2017). These findings suggest that communication must be institutionalised, not just encouraged as a core element of food safety governance.

Informal communication, often overlooked, can be just as influential. Johnson et al. (1994) and Griffith et al. (2010b) found that employees often perceive informal channels as more authentic and responsive than formal ones. For example, Lorenzen (1997) introduced the concept of "management by walking around," which facilitates spontaneous, trust-building conversations. Employees are also more likely to raise concerns with peers involved in risky practices, contributing to real-time improvements in hygiene and safety (Griffith et al., 2010b; De Boeck et al., 2015). According to Uzzi (2018) and Argote, Evily, and Reagans (2003), strong interpersonal relationships support informal knowledge exchange that extends beyond formal training. Yiannas (2009) reinforces this view, arguing that daily communication practices are essential for sustaining alignment with food safety priorities.

2.14.4 Competence

Although competence is frequently discussed across academic and professional domains, its definition remains elusive and inconsistently applied. Rather than offering a singular interpretation, scholars have approached the concept from multiple angles, reflecting its complexity and contextual nature. For example, Hager and Gonczi (1996) and Kirjavainen and Laakso – Manninen (2000) describe competence as the alignment between an individual's capabilities and the demands of a given task. This relational view contrasts with more

individual-focused definitions such as that Ellstrom and Kock (2008), who emphasise the integration of perceptual-motor, cognitive, affective and personality-related dimensions in task performance. What is widely agreed, however, is that competence is central to organisational effectiveness. It underpins not only productivity and innovation but also employee engagement and well-being (Taatila, 2004; Karasek & Theorell, 1990; Robinson et al., 2007). Amstrong and Ward (2005) and Kollibacova (2014) further associate competence with a blend of knowledge, skills and behaviours as well as alignment with organsational values. In contemporary frameworks, this blend increasingly includes soft skills such as communication, leadership and critical thinking alongside technical expertise (Bacilagupo et al., 2016; Chouhan & Srivastava, 2014).

In the domain of food safety, competence takes on a more applied and behavioural dimension. Wright and Leach (2013) argued that it encompasses not only knowledge of risk but also behavioural adherence and the influence of organisational culture. This perspective is supported by studies showing that food safety behaviour is shaped by a combination of training, work habits, psychososial factors and demographic characteristics (Hinz et al., 2007; Griffith et al., 2010a; Fatimah et al., 2014b). While training is often positioned as the primary mechanism for developing competence (Ball et al., 2010; Caccamo et al., 2018), its effectiveness is limited when not supported by broader organisational systems. Indeed, knowledge alone does not ensure behavioural compliance. Green et al., (2007) and Emond (2018) highlighted that without reinforcement, monitoring and a supportive environment, training outcomes may not translate into practice. A more holistic approach is therefore required; one that integrates formal instruction with behavioural reinforcement, organisational support and countinous feedback. Only through such an integrated strategy can competence be consistently applied and sustained in high-stakes environments such as food safety.

CHAPTER THREE
METHODOLOGY

3.1 Chapter Structure and Content

The preceding chapter provided a comprehensive review of the literature pertinent to this research. This chapter presents the methodological framework of the study, grounded in a pragmatist paradigm that supports methodological triangulation. A phased mixed-methods research design is outlined, integrating quantitative and qualitative approaches to address the research questions. Data are collected through questionnaires, semi-structured interviews and focus groups. The chapter also reflects on the researcher's insider positionality and addresses issues of trustworthiness, ethics, and research procedures, emphasising the study's rigour and reflexivity.

3.2 Methodological Process

This chapter is underpinned by Grix's (2002) conceptual framework which serves as a foundational guide for aligning the study's philosophical assumptions with its methodological choices. As demonstrated in figure 3.1, the framework provides a coherent structure for understanding the interconnections across the research process. The subsequent sections offer a concise overview of each phase, establishing a logical progression from theoretical orientation to practical implementation

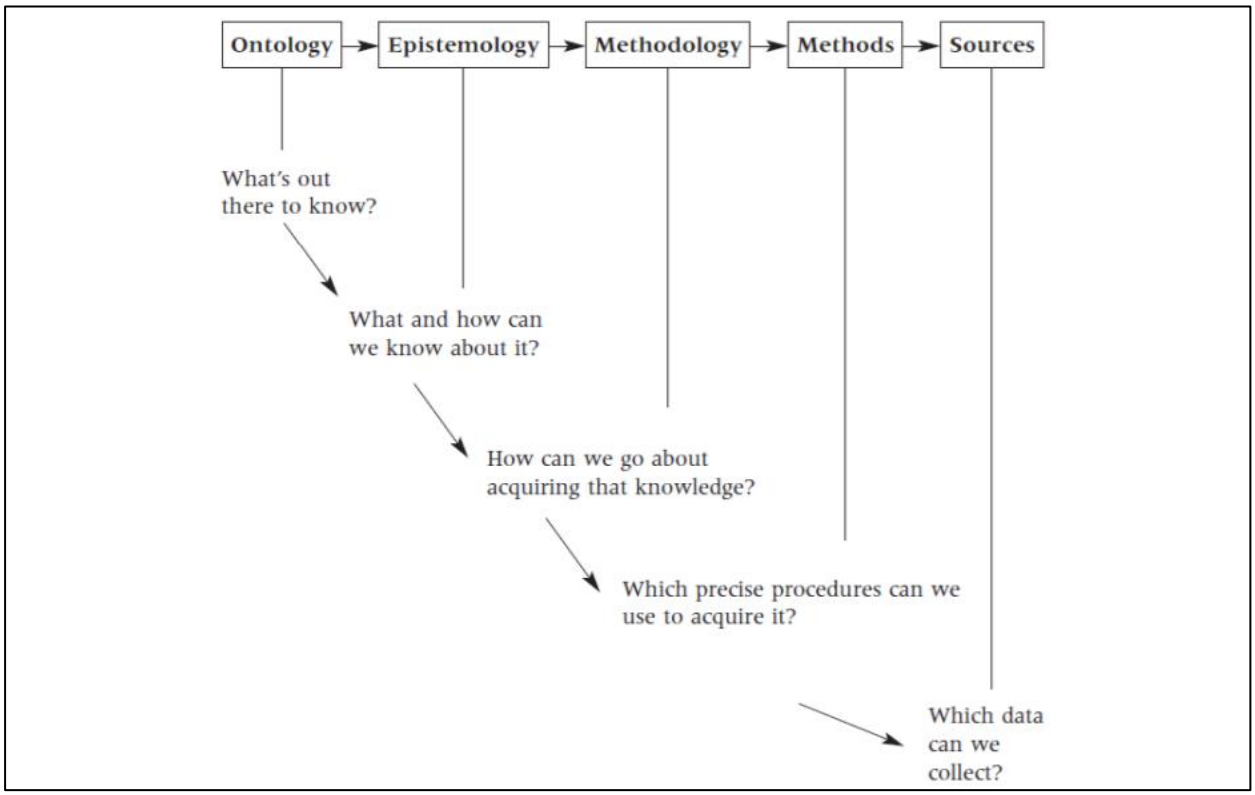


Figure 3.1
Coherence among Research Paradigm Elements
Source: Adopted from Grix (2002)

The process of designing a research study begins not with abstract philosophical debates but with practical decisions about how knowledge will be generated. At this stage, methodology plays a central role, offering a structured approach to inquiry that aligns with the nature of the research problem. As Wahyuni (2012) suggests, methodology functions as a roadmap, guiding researchers through the stages of data collection and analysis. While no single methodology is universally applicable (Tuli, 2010), each offers distinct advantages depending on the context and objectives of the study.

Once a methodological direction is established, researchers must determine the methods including the specific tools and techniques that are most appropriate for gathering data. In this study, the selected methods include questionnaires, semi-structured interviews and focus groups. These instruments were chosen to reflect a pragmatic approach to data collection as

supported by Mackenzie & Knipe (2006). Unlike paradigms or methodologies, methods are not inherently philosophical; rather they are selected based on the research questions and the nature of the data required (Grix, 2002).

These practical decisions are grounded in deeper philosophical assumptions that shape the overall research design. The research paradigm, which consists of a set of beliefs about reality and knowledge, influences how researchers conceptualise their work. Taylor (2005), Denzin and Lincoln (2005) and Gray (2004) have all emphasised the importance of this framework in guiding research decisions. At the core of any paradigm are the concepts of ontology and epistemology, which are closely interrelated.

Ontology concerns the nature of reality and addresses questions about what exists and what can be known. Klinger and Boardman (2011) describe ontology as the study of what is real, while Gray (2004) and Grix (2002) explore whether reality is objective and independent or subjective and shaped by individual experience. Scotland (2012) argues that reality may vary from person to person, whereas Gray (2013) presents the view that universal truths may exist independently of perception. In contrast, epistemology focuses on nature and acquisition of knowledge. It examines how knowledge is formed, validated and understood. Creswell (2008) explains that epistemological assumptions influence how researchers collect, interpret and analyse data. Scotland (2012) further highlights the impact of these assumptions on methodological choices.

The relationship between ontology, epistemology and the broader research paradigm continues to be a subject of scholarly debate. Guba and Lincoln (1994), Saunders (2015) as well as Denzin and Lincoln (2005) have all contributed to this ongoing discussion. Although there is no universal agreement on how paradigms should be classified, this study focuses on three widely recognised traditions. These include Positivism, Interpretivism and Pragmatism. Each paradigm is examined in terms of its ontological, epistemological, methodological, axiological

and procedural characteristics, as illustrated in Table 3.1. Pragmatism was ultimately selected because it aligns most closely with the research objectives and offers the flexibility needed to address complex research questions. Positivism and Interpretivism were considered less suitable for this study.

Finally, the study draws upon a variety of data sources to support its findings. These sources include primary data such as interviews and surveys as well as secondary data, such as academic literature and published reports. Grix (2004) notes that combining different types of sources allows researchers to develop a more comprehensive and nuanced understanding of the research topic.

The following table presents a comparative summary of three widely recognised research paradigms : Positivism, Interpretivism and Pragmatism. The comparison is structured around five principal dimensions, namely, Ontology, Epistemology, Methodology, Axiology and Methods.

Table 3.1
Comparison of Research Paradigms

Dimension	Positivism	Interpretivism	Pragmatism
Ontology	Naïve Realism : A single, observable reality exists independently of human perception.	Relativism : Reality is shaped by individual and cultural interpretation.	Pragmatic realism : Reality is experienced differently by individuals and is best understood through its practical consequences.
Epistemology	Objectivism : Knowledge is derived from observable and measureable facts, independent of the researcher's values.	Subjectivism : Knowledge is based on the meanings individuals assign to their experiences.	Pragmatic epistemology : Knowledge is a product of experience and practical engagement with real-world problems.

Methodology	Deductive approach : Hypotheses are tested through structured data collection and statistical analysis.	Inductive approach : Theories emerge from qualitative data gathered through interviews, observations and document analysis.	Abductive approach : Combines both inductive and deductive reasoning to address complex research questions through a problem-centered lens.
Axiology	Value-neutrality : Strives for objectivity and minimises the influence of the researcher's values.	Value-laden : Acknowledge the influence of the researcher's beliefs and ethical considerations.	Reflexivity : Emphasises the researcher's values and experiences as integral to the research process.

Source : Guba & Lincon (1994), Gray (2004), Mackenzie & Knipe (2006), Ormstom et al. (2014), Morgan et al. (2014), Wahyuni (2012), Scotland (2012), Saunders et al. (2015), Kivunja & Kuyini (2017), Mitchell (2018).

3.2.1 Ontological Perspectives

Food safety culture is a multifaceted concept, shaped not only by scientific knowledge but also by the collective beliefs, values and practices of those within food-related environments. Understanding this complexity requires a philosophical stance that accommodates both objective realities and socially constructed meanings.

Some scholars advocate for a positivist ontology such as naïve realism, which assumes the existence of a single, observable reality. This reality is believed to be measurable and universally comprehensible (Guba and Lincoln, 1994; Ponterotto, 2005). Within this framework, individuals in the food sector are expected to respond to food safety risks in a consistent and uniform manner. However, this assumption fails to account for the diverse cultural, organisational and individual interpretations that influence food safety practices.

Despite its strengths, constructivism may not be sufficient for addressing the biological threats that are inherent to food safety. Pathogens such as Listeria, Salmonella and Staphylococcus aureus represent what Anscombe (1958, p. 69) refers to as "primitive facts". These are

phenomena that exist independently of human perception and require practical interventions and regulatory responses that go beyond subjective interpretation.

To address these philosophical tensions, this study adopts a pragmatic approach. Pragmatic does not rely on a strict division between realism and relativism. Instead, it focuses on the research problem and the specific questions and objectives of the study (Biesta, 2010; Morgan, 2014). Knowledge, from this perspective, is understood as emerging from human experience and purposeful action. By adopting pragmatism, the study recognises that external realities do exist, but that individuals interpret these realities through their own experiences and perspectives (Putnam, 1998). This philosophical stance supports the development of practical and culturally sensitive strategies for improving food safety. At the same time, it upholds the importance of objective standards that are essential for protecting public health. It also acknowledges that individuals construct their own versions of reality, shaped by both personal and collective contexts (Wahyuni, 2012; Kaushik and Walsh, 2019).

3.2.2 Epistemological Perspective

Understanding the philosophical foundations of research is essential when addressing complex, real-world issues such as food safety culture. Pragmatism, as both an ontological and epistemological orientation, offers a flexible and problem-centered approach. Rather than adhering to rigid distinctions between objectivity and subjectivity, pragmatic epistemology conceptualise knowledge as a dynamic and evolving process (Goles and Hirschheim, 2000). This perspective allows researchers to draw from a range of methodological tools, selecting those most appropriate for addressing specific research questions (Kaushik and Walsh, 2019). Mixed Method Research (MMR) is firmly rooted in the pragmatic tradition (Mackenzie and Knipe, 2006). It enables researchers to explore, explain and understand phenomena through a combination of inductive and deductive reasoning. This integrated approach, known as

abduction, supports the development of nuanced insights by linking observed data with theoretical interpretation (Saunders, 2015; Mitchell, 2018). Morgan (2014) describes abduction as a form of conditional reasoning, where particular actions are expected to lead to specific outcomes.

In the context of this study, which focuses on food safety governance in the homemade food producers, a pragmatic epistemological stance is particularly valuable. It emphasises the importance of practical solutions that are effective in real-world settings. Rather than relying exclusively on theoretical models, this approach seeks to generate knowledge that is both applicable and actionable. The research will employ a mixed method design, combining quantitative and qualitative techniques to capture a comprehensive understanding of the issue. By interpreting surprising findings (Kovacs and Spens, 2005) and identifying the most plausible explanations (Mitchell, 2018), the study aims to develop a practical framework to support improved compliance with food safety standards.

3.3 Research Methods

The methodological design of this study incorporates a combination of quantitative and qualitative approaches to facilitate comprehensive primary data collection. Initially, the research will employ quantitative instruments to gather measurable data relevant to the study's objectives. This will be followed by the application of qualitative techniques, which aim to capture deeper contextual insights. The final part of this section will examine the mixed methods approach, highlighting how it synthesises both strands of inquiry and aligns with the overarching theoretical framework that underpins the research.

Hence, this is the appropriate method to conduct the study, as it enables the development of a holistic understanding of how food safety can be governed among online homemade food

producers in Malaysia. By integrating multiple forms of data and analysis, the research aims to produce findings that are both empirically grounded and contextual meaningful.

3.3.1 Quantitative Research

The use of quantitative research methods is particularly effective when the aim is to identify measurable relationships between variables. This approach, which is grounded in a positivist epistemology and objectivist ontology, is commonly associated with structured techniques such as surveys and experiments (Saunders et al., 2015; Gray, 2004). As Vanderstoep and Johnson (2009, p. 167) explain, the core objective of quantitative research is to analyse numerical data in order to detect statistically significant correlations within a population. Typically, the process begins with the formulation of hypotheses and a clearly defined problem statement (Khalid et al., 2012), followed by the application of deductive reasoning and transparent statistical procedures to ensure the validity of findings (Taylor, 2005; Bryman and Bell, 2007; Gray, 2004).

In the context of this study, quantitative methods will be used to examine questionnaire responses collected from homemade food producers or business owners in Malaysia. The analysis will focus on four key thematic areas of EFSCM, as outlined in chapter 2 and will test the corresponding hypotheses. Descriptive statistics will be employed in the initial phase to summarise the data and explore patterns among variables. These techniques are valued for their ability to provide a foundational understanding of the dataset (Hantrais, 2009) and have been widely used in food safety research to support both exploratory and confirmatory analysis (Denzin and Lincoln, 2005; Bryman and Bell, 2007).

Although quantitative methods are widely accepted, they are not without criticism. Scholars such as Gray (2004) have argued that the positivist paradigm may oversimplify the complexity of human behaviour and social interaction. The assumption that theories can be universally

validated is often challenged by the presence of exceptions or context-specific variables. Nevertheless, the utility of quantitative approaches in food safety research remains well supported. Studies by Taylor et al. (2015), Watson et al. (2022), De Boeck et al. (2015), Zabukosek et al. (2016) and Fatimah et al. (2014b) have demonstrated the effectiveness of survey-based methods in enhancing food safety culture and achieving regulatory objectives.

3.3.2 Qualitative Research

Qualitative Research is widely recognised for its capacity to explore the depth and complexity of human experience. Rather than focusing on numerical measurement, it seeks to understand how individuals interpret their world, often through the lens of their values, beliefs and assumptions (Boodhoo and Purmessur, 2009; Yauch and Steudel, 2003). This interpretive orientation is grounded in a philosophical commitment to subjectivity and meaning-making, as noted by Ben Aissa (2001) and is typically supported by an epistemology that prioritise contextual understanding (Bryman and Bell, 2007).

To generate such insights, qualitative researchers employ a range of data collection methods. These include interviews, focus groups, document analysis and observational techniques, all of which are underpinned by inductive reasoning (Creswell, 2009; Neuman, 1997). The emphasis is placed on capturing rich, detailed accounts of lived experience, which are then interpreted to contribute to broader understanding.

Despite its strengths, qualitative research has been subject to criticism, particularly from scholars aligned with positivist traditions. Taylor (2005) argues that the lack of control and standardisation in qualitative methods can limit their ability to address certain research questions in the behavioral sciences. Wilson et al. (2008, p. 17) further highlight this scepticism, nothing that qualitative researchers are sometimes dismissed as "journalists or soft

scientists". In response to such critiques, scholars such as Arendt et al. (2011) have emphasised the importance of ensuring trustworthiness through rigorous methodological practices.

Nevertheless, the advantages of qualitative methods are well-documented. Janićijević (2011) points to their flexibility and capacity for comprehensive exploration, while Arendt et al. (2011) demonstrates how techniques such as interviews and focus groups can reveal complex variables that are often inaccessible through surveys. Their study identified a range of factors influencing food safety practices, including compliance with standards, handwashing behaviours and perceptions held by both managers and employees (Arendt et., 2011, p. 834).

Although qualitative research has not been widely adopted as a standalone method in food safety culture studies (Ball et al., 2010; Wright et al., 2012; NSF, 2016; Griffith et al., 2017), its value is increasingly recognised in combination with quantitative approaches. Tashakkorie and Teddie (2003, p. ix) advocate for a pragmatic integration of methods, a view echoed by Pansiri (2005), Creswell (2003), Jespersen and Wallace (2017) and Nyarague et al. (2018). This study follows that recommendation by employing semi-structured interviews and focus groups within a mixed-method framework, guided by a pragmatic philosophical orientation.

To ensure analytical rigour, qualitative researchers must adopt clear and systematic procedures. Among the most widely used are thematic analysis, grounded theory, and content analysis (Braun and Clarke, 2006; Clarke and Braun, 2013; Nowell et al., 2017; Hsieh and Shannon, 2005; Charmaz, 2014). Braun and Clarke (2006) describe thematic analysis as a foundational method that is not tied to any specific theoretical stance. They distinguish between a theoretical approach, which is driven by research questions, and an inductive approach, which allows themes to emerge from the data itself. This study adopts the latter, using a bottom-up thematic analysis to identify patterns and insights grounded in participants' lived experiences.

3.3.3 Research Design – Mixed Methods Approach

Addressing multifaceted research problems often requires a methodological approach that transcends traditional boundaries. Mixed methods research, which combines qualitative and quantitative strategies, has emerged as a powerful tool for this purpose (Creswell et al., 2003; Tashakkori and Teddlie, 1998). The rationale behind this approach lies in its ability to compensate for the limitations of individual methods by integrating their respective strengths (Creswell, 2009). Researchers may adopt a sequential design, beginning with qualitative exploration and progressing to quantitative validation, or they may opt for concurrent strategy to capture a more holistic view (Creswell, 2009). According to Tashakkori and Teddlie (2003, pp. 14-15), mixed methods are uniquely positioned to address questions that single-method designs cannot, offering broader insights and more reliable conclusions.

Despite its potential, the uptake of mixed methods has been hindered by longstanding philosophical divisions. Mendenhall et al. (1993) reported that few management studies employed qualitative or combined approaches. Pansiri (2005) observed that while mixed methods are gaining traction in tourism research, their philosophical foundations are often neglected. He advocated for a pragmatic stance, which provides a coherent basis for integrating diverse methodologies. Pragmatism supports abductive reasoning, a process that combines inductive and deductive logic to facilitate flexible and iterative inquiry (Saunders, 2015; Mitchell, 2018). Sale et al. (2002) identified triangulation and complementarity as two key justifications for combining methods. Triangulation enhances validity by using multiple sources, while complementarity allows one method to enrich the other. The use of triangulation in social science research dates back several decades. Denzin (1970), Campbell (1959) and Miles (1994) emphasised its role in distinguishing between methodological artefacts and genuine findings. Researchers have developed various forms of triangulation including data, investigators, theory and methodological triangulation to examine food safety culture, drawing

on both qualitative and quantitative data to enhance analytical depth (Amaratunga et al., 2002; Carugi, 2016).

Triangulation also improves the quality of data analysis by enabling researchers to validate findings, resolve inconsistencies and clarify ambiguous responses (Floyd 1993; Sale et al., 2002; Nakkash et al., 2003; Ben Letaifa, 2006; Creswell, 2009). Jespersen and Wallace (2017b) demonstrated this in their study of five multinational food companies, where they triangulated surveys, documents and interviews to assess food safety maturity. Watson et al. (2022) employed a similar approach in a UK fish processing firm, using surveys, interviews and focus groups to validate a food safety culture model. Meanwhile, Nyarugwe et al. (2018) used a comprehensive mixed-method design to assess food safety culture in Zimbabwean dairy companies, employing six tools to examine key behavioral and organisational factors.

Given the complexity of organisational culture, particularly in food safety contexts, triangulation and mixed methods provide a more valid and nuanced understanding (Yeasmin and Rahman, 2012). However, researchers must be mindful of the philosophical and logistical challenges involved in integrating diverse data sources (Norman et al., 2011). Despite these challenges, triangulation remains a cornerstone of rigorous and insightful research (Jespersen and Wallace, 2017b; Carugi, 2016). Hence, this research investigates the governance of safety among online homemade food producers in Malaysia by examining the underlying food safety culture. To achieve a nuanced understanding of this phenomenon, a mixed methods design has been selected, employing methodological triangulation as the core strategy. The study integrates three complementary data collection techniques: questionnaire to capture broad quantitative insights, semi-structured interviews to explore individual experiences in depth and focus groups to facilitate collective reflection and discussion as shown below (Table 3.2). By converging these methods, the research aims to generate a rich, multidimensional dataset that enhances the validity and reliability of the findings.

Table 3.2
Research Methods

Survey →	Interview →	Focus Group
• A survey data (questionnaire) will influence 1:1 discussion data in this study. • Thus, a larger sample (200 surveys) will be distributed to the respondents (homemade food producers or business owners who market and sell their food products via e-commerce or online platform) across Malaysia. • This will help gather information on their current practices in handling food for their business and customers. • Procedure: Distribute an online questionnaire based on themes from the interviews. Questions will cover food safety practices, compliance and challenges.	• Semi-structured interviews. • The interview will focus on 14 Food Technologist from the Food Safety and Quality Division (FSQD), Ministry of Health, Malaysia (MOH), representing each of the 14 states in Malaysia. • These officers are well-equipped to provide accurate information and insights regarding current food safety and standards and guidelines applicable to home businesses that producing foods. • Procedure : conduct interviews using an interview guide to explore food safety practices, challenges and regulatory compliance.	• 1:1 discussion data will influence focus group (selected participants from the interviews and survey). • Procedure : Facilitate discussion to validate and deepen understanding on the findings.

3.4 Instrument Selection

To ensure methodological rigour and depth in data collection, this study adopts a triangulated approach that integrates multiple qualitative and quantitative tools. Central to this strategy is the deliberate selection of three complementary techniques : questionnaires, semi-structured interviews and focus groups. These instruments were chosen not only for their individual

strengths but also for their collective capacity to capture diverse dimensions of the research phenomenon. As discussed in the following sections, this methodological configuration enhances the reliability and richness of the data collected, thereby supporting a more nuanced analysis of the study's core themes.

3.4.1 Questionnaire as a Research Tool

Understanding the rationale behind the selection of data collection tools is essential in designing a robust research methodology. In this study, the questionnaire was not merely chosen for its popularity but for its strategic alignment with the research objectives. Its widespread application in diverse domains, ranging from organisational culture (Collins and Gadd, 2002) to food safety culture (Taylor et al., 2015; De Boeck et al., 2015), demonstrates its versatility and empirical value. Guldenmund (2000), for instance underscore its utility in safety culture research, where structured responses are critical for comparative analysis.

The decision to deploy an online questionnaire was guided by both practical and methodological considerations. Online surveys, as Creswell et al. (2003) argue, offer significant advantages in terms of reach and efficiency. They allow researchers to access geographically dispersed populations while reducing time and financial costs. Moreover, the virtual platform enhances consistency in question delivery and eliminates respondents bias, which Judd et al. (1991) note can influence participant responses in face-to-face settings. These benefits are further amplified by the anonymity afforded by respondents, which can encourage more honest and reflective answers.

Ethical safeguards were also embedded into the research design. The concepts of anonymity and confidentiality, though often conflated, were clearly delineated. While anonymity ensures that the researcher cannot trace responses back to individuals, confidentiality implies that identities are known but securely protected through secure data handling (Fleming and

Zegwaard, 2018; Cacciatolo, 2015; Sieber, 1992). Participants were informed at the outset that their data would be anonymised and reported in aggregate form (Sreejesh et al., 2014). No personally identifying information was collected, aside from general demographic such type of homemade food, duration of business operation, selling platforms, business role, food safety training, education level, gender, age range and location of producers.

Language accessibility posed another methodological challenge. Given that English is not the first language of the target population, the questionnaire was translated into Malay language to minimise misinterpretation. This translation was followed by a pre-testing phase, which served to identify ambiguities and refine the instrument accordingly (Sreejesh et al., 2014). The pilot study that followed (see Chapter 4) further validated the questionnaire's content and structure.

3.4.2 Semi-Structured Interviews as a Research Tool

While interviews are a cornerstone of qualitative research, their application varies considerably depending on the study's objectives (Denzim and Lincoln, 2005; Vanderstoep and Johnson, 2009; Mathers et al., 1998). In food safety culture research, interviews have largely functioned as complementary instruments that assist in conducting assessments (Ball et al., 2010; Wright et al., 2012; Griffith et al., 2017), enrich survey designs (Fatimah et al., 2014b) or triangulate findings from other data sources (Jespersen et al., 2017; Watson et al., 2022; Cacamao et al., 2018). However, despite their widespread use, interviews have not yet been employed as a primary method for theory development in this field.

The rationale for using interviews in safety culture has been well-articulated by Guldenmund (2000), who emphasised their utility in verifying findings, assessing information and contributing to theoretical frameworks (Guldenmund, 2000, p. 120). Yet, the effectiveness of interviews depends not only on their purpose but also on their design. The structure and phrasing of interview questions can significantly shape the nature and depth of participant

responses (Vanderstoep and Johnston, 2009). Interviews may be structured to elicit either brief, specific answers or more elaborate, reflective narratives. Three primary formats are commonly employed : structured, unstructured and semi-structured (Mathers et al., 1998). Structured interviews, while useful for collecting standardised data, limit the scope for participant-led discussion and emergent insights (Mathers et al., 1998; Vanderstoep and Johnston, 2009). In contrast, unstructured interviews offer a more fluid and participant-centred approach, enabling researchers to explore the interviews offer a more fluid and participant-centred approach, enabling researchers to explore the interviewee's worldwide without a predetermined agenda (Mathers et al., 1998). The relationship between interviewer and participant is particularly crucial in this format.

Semi-structured interviews which balance flexibility with consistency are especially prevalent in mixed-methods food safety culture research (Fatimah et al., 2014a; Jespersen et al., 2017; Watson et al., 2022). They also serve as a means of revisiting and deepening understanding of issues identified in earlier phases (Raworth et al., 2012). For instance, Watson et al., (2022) used survey data to guide subsequent interviews, demonstrating the interative nature of such approaches. Denzin and Lincoln (2005) similarly advocate for integrating interviews to complement quantitative findings.

Beyond methodological considerations, semi-structured interviews provide a platform for participants to articulate their lived experiences and perspectives (Kvale and Brinkmann, 2009, p. 27). They also allow researchers to probe further when responses are limited (Mathers et al., 1998). To maximise their effectiveness, Raworth et al. (2012) recommend the use of an interview guide that includes both open and closed-ended questions, supported by careful vocabulary selection and pilot testing. In the current study, semi-structured interviews were employed to explore themes emerging from the initial survey phase (Please refer to Appendix 3.1). An interview script was developed and reviewed by expert content (Section 3.10.1) to

ensure contextual relevance. To maintain data integrity and minimise linguistic barriers, the interview guide was translated into Malay language (Bahasa Malaysia), the respondent's native language.

3.4.3 Focus Group as a Qualitative Research Instrument

Focus group discussions are widely recognised as a valuable qualitative research method. They are employed across various disciplines, including psychology, education, health research, marketing, and safety culture. Their ability to generate rich, interactive data has been highlighted by Nyumba et al. (2018), Guldenmund (2008), and Arendt et al. (2012). Morgan (1997) noted that focus groups can be used independently or alongside other methods, serving both exploratory and confirmatory purposes. In applied research, Lee and Harrison (2000) demonstrated this flexibility by using focus groups to refine a questionnaire in their study on nuclear power stations in the United Kingdom.

The contribution of focus groups to methodological triangulation is particularly significant. They offer insights into the social construction of meaning through group interaction, which is often absent in individual interviews or surveys. Caillaud and Flick (2017) emphasised that triangulation using focus groups enhances the depth and reliability of qualitative findings. Webb et al. (1981) also supported this view. However, researchers must avoid using identical interview scripts across different formats. Doing so may reduce the effectiveness of focus groups and limit their potential for triangulation, as argued by Markova et al. (2007) and Halkier (2010). A more robust approach involves comparing data from both individual and group interviews to identify complementary insights, as recommended by Caillaud and Flick (2017).

Although focus groups are not commonly used in food safety culture research, they have shown considerable potential in this area. Ball et al. (2010) used focus groups to explore stakeholder

perspectives on the implementation of food safety management systems. Fatimah et al. (2014b) began their study with focus group sessions to identify behavioural factors influencing safe food handling, which informed the development of their survey instrument. Watson et al. (2022) adopted a mixed-methods approach, combining focus groups with semi-structured interviews and surveys to conduct a thematic analysis and cluster emerging themes.

The role of the researcher in focus group settings differs from that in individual interviews. In focus groups, the researcher typically acts as a facilitator or moderator, guiding the discussion without dominating it. Hohenthal et al. (2015) and Arendt et al. (2012) described this role as peripheral, allowing participants to lead the conversation. Barbour (2014) stressed the importance of structuring the discussion carefully to ensure meaningful engagement.

Several types of focus group formats have been identified in the literature. The traditional single-group format, where participants and facilitators meet in one location, remains the most common (Morgan, 1996). Other formats include two-way focus groups, in which one group observes another, and mini focus groups composed of experts (Morgan et al., 1998; Kamberelis and Dimitriadis, 2005). Duelling moderator groups involve two facilitators who take opposing positions to stimulate discussion (Krueger and Casey, 2000). Online focus groups are a digital adaptation of conventional methods. While they offer convenience, they are also vulnerable to technical issues such as poor connectivity and the lack of non-verbal cues, as noted by Dubrovsky et al. (1991).

Managing participant dynamics is essential to the success of focus group discussions. Some individuals may dominate the conversation, while others may remain silent. Arendt (2012) highlighted this challenge whereas Orfali and Markova (2002) emphasised the importance of effective moderation. Acocella (2012) and Nyumba et al. (2018) also underscored the need for balanced participation. Krueger (1994) suggested that participants should share similar

characteristics, such as age, gender, ethnicity, and socio-economic background, to facilitate smoother exchanges.

The number of participants and the quantity of focus groups conducted are also critical considerations. Guest et al. (2017) recommended conducting at least three sessions to ensure thematic saturation. Burrows and Kendall (1997) supported this view, noting that a single session may not capture the full scope of the topic. A group size of six to ten individuals is generally considered optimal for meaningful dialogue (Morgan, 1998; Krueger and Casey, 2000). If the number of participants exceeds twelve, it may be necessary to divide them into smaller groups to maintain manageability and depth of discussion (Krueger, 1994).

Establishing the conditions under which focus group discussions take place is as critical as the methodological design itself. The physical environment must be conducive to participant comfort, a point underscored by Smith (1972), while the duration of each session should be carefully calibrated. Sessions lasting between one and two hours are generally considered appropriate, although this depends on factors such as the complexity of the topic, the number of guiding questions, and the size of the group. Caillaud and Flick (2017) caution that prolonged discussions may lead to participant fatigue, which can diminish the quality of responses.

Equally important is the linguistic accessibility of discussion. When participants are not native speakers of the research language, the risk of misinterpretation increases. Braun and Clarke (2013) and Creswell (2013) have both emphasised the necessity of translating focus group materials to ensure clarity and inclusivity. This practice not only facilitates comprehension but also encourages active engagement, thereby enhancing the reliability and richness of the data collected.

In the present study, the focus group method was employed alongside surveys and semi-structured interviews. This integration reflects a triangulation strategy that is widely supported

in the literature, provided that the methods involved do not rest on fundamentally incompatible epistemological assumptions. Flick et al. (2012) and Kelle and Erzberger (2004) argue that such methodological pluralism is feasible and beneficial. Morgan and Spanish (1984) similarly advocate for combining qualitative and quantitative approaches to strengthen research validity. The structure of the focus group component was informed by insights gained during the interview phase. In this research, Three (3) focus group discussions were conducted. One discussion was held with five homemade food producers, another with five Food Technologists and a third with a mixed group of homemade food producers and Food Technologists. Food Technologists were selected as participants due to their extensive expertise in food safety, standards, and guidelines relevant to homemade food businesses. Given their responsibilities for monitoring compliance and enforcing food safety regulations, they were well positioned to provide informed insights into current practices, regulatory challenges, and governance issues affecting the homemade food sector.

To ensure meaningful participation, especially among individuals whose first language is not English, the researcher translated the focus group agenda into Malay. This step was taken to promote inclusivity and to ensure that all participants could fully engage with the discussion topics. Thematic analysis was then conducted to identify and organise the key themes emerging from the data. This analytical process provided a comprehensive understanding of the cultural factors influencing food safety behaviours and informed the development of targeted interventions aimed at improving food safety governance.

3.5 Reflexivity

Reflexivity is a cornerstone of qualitative inquiry, demanding that researchers critically examine their own roles, assumptions, and ethical responsibilities throughout the research process. McGraw et al. (2000, p. 68) defines reflexivity as a deliberate act of self-scrutiny,

where researchers confront the ethical dilemmas embedded in their practices. This perspective is echoed by Hertz (1997, p. viii), who asserts that reflexive researchers actively construct interpretations rather than merely report findings.

Harding (1986; 1987; 1991) broadens this view by arguing that reflexivity permeates every stage of the research process, from the formulation of research questions to the interpretation of results. Guillemin and Gillam (2004) reinforce this by describing research as an active and reflective endeavour, where knowledge is co-produced through participant engagement and methodological interrogation.

Mason (1996) adds that researchers must be evaluated with the same scrutiny as their findings, highlighting the importance of transparency and accountability. In this context, a pragmatist orientation offers a comprehensive framework that integrates reflexivity with methodological rigour, ethical practice, and systematic data collection (Smyth and Holian, 2008). Insider research, situated within this reflexive and pragmatist paradigm, emerges as a viable approach for achieving depth, authenticity, and relevance. The next section explores the researcher's insider position and its implications for the study.

3.6 Engaging as an Insider Researcher

Insider research, characterised by the researcher's membership or close familiarity with the studied group, offers unique advantages and challenges within qualitative inquiry. It enables a nuanced understanding of the research context, particularly during data analysis and interpretation, where familiarity with language, acronyms, and cultural references reduces the risk of misinterpretation (Brannick and Coghlan, 2007). This insider perspective can enhance the accuracy of data collection and facilitate richer insights into participant experiences (Bonner and Tolhurst, 2002).

However, the proximity of the researcher to the subject matter raises concerns regarding objectivity and ethical integrity. Studies have highlighted the risk of disclosing sensitive information and failing to maintain appropriate boundaries, particularly when researchers have unrestricted access to internal data (Saidin and Yaacob, 2016; Smyth and Holian, 2008). To mitigate these risks, maintaining a professional distance is essential. This includes safeguarding participant anonymity and ensuring that contextual descriptions do not inadvertently reveal identities (Floyd and Arthur, 2012; Trowler, 2011). These ethical considerations are discussed further in Section 3.8.

The methodological rigour of insider research also warrants attention. Interviews, a common data collection method, may be influenced by the researcher's relationship with participants. Responses can be shaped by trust, fear of judgement, or the desire to protect ongoing relationships (Chavez, 2008; Mercer, 2007). Dwyer and Buckle (2009) caution against informant bias, where familiarity may either inhibit probing or encourage deeper disclosure. Researchers are advised to maintain neutrality and avoid sharing personal experiences during interviews (Fleming, 2018).

Despite these challenges, insider research remains a valuable approach when conducted with transparency and ethical sensitivity. Its potential to uncover rich, contextually grounded data makes it a powerful tool, provided that researchers remain critically aware of their positionality and take steps to minimise bias (Brannick and Coghlan, 2007; Dwyer and Buckle, 2009; Hellawell, 2006).

Given the reflexive nature of this study, it is essential to outline the researcher's professional and academic background, which has significantly shaped the research design and contextual understanding. Over the past ten years, the researcher has worked as a consultant specialising in food safety and HALAL certification training, primarily supporting small and medium-sized enterprises (SMEs) and home-based food producers in Malaysia. This role has provided

extensive exposure to the operational realities, regulatory frameworks, and behavioural challenges faced by food businesses in implementing safe and compliant practices.

In addition to industry experience, the researcher holds academic qualifications in food safety and has teaching experience in business-related subjects. These academic engagements frequently intersect with food industry topics, allowing the researcher to explore the sector from both theoretical and practical perspectives. This dual lens has been instrumental in formulating research questions and interpreting literature, particularly in understanding the socio-cultural and regulatory factors influencing food safety behaviours.

The researcher's familiarity with the industry context has also facilitated access to relevant networks and participants. However, this proximity raises potential concerns regarding bias and interpretive neutrality (Saidin and Yaacob, 2016; Lincoln and Cuba, 1985).

Beyond experiential knowledge, the researcher's sustained engagement within the sector enabled access to key professional networks, including SME owners, food safety consultants, and officers from the Ministry of Health. These affiliations served to legitimise the researcher's role and facilitated the development of rapport with participants, who regarded the researcher as a peer. Bryan and Bell (2007) contend that shared professional and cultural backgrounds can foster openness and trust, thereby enhancing the depth and authenticity of the data collected. Merriam and Tisdell (2015) similarly observe that participants are more inclined to disclose sensitive information when they feel understood. Furthermore, the use of shared language and cultural references contributed to effective communication and improved data accuracy (Bryan and Bell, 2007).

To uphold ethical standards and maintain neutrality, the researcher formally introduced the study to professional networks based in Kuala Lumpur, Malaysia, and requested their support in identifying appropriate participants for the three-stage research process. These networks subsequently disseminated information to their respective members, who then extended

invitations to individuals involved in food safety. This strategic engagement resulted in several advantages, including facilitated access to reach the respondents, efficient participant recruitment, and timely coordination of interviews and focus group sessions.

Nevertheless, insider research demands careful attention to the concept of trustworthiness, which underpins the study's integrity and credibility. As Lincoln and Cuba (1985) and Korstjens and Moser (2018) emphasized that establishing trustworthiness is essential in qualitative inquiry, particularly when the researcher occupies a dual role as both observer and participant. The following section (see 3.8 Ethical Considerations) explores these ethical dimensions in greater detail.

3.7 Ensuring Rigour and Trustworthiness in Mixed Methods Research

Establishing trustworthiness in qualitative research requires a multifaceted approach that goes beyond traditional measures of validity and reliability. Lincoln and Guba (1985) introduced the concept of trustworthiness to encompass credibility, transferability, dependability, and confirmability, offering a framework more suited to interpretive inquiry. In contrast to quantitative paradigms, which rely on statistical measures to ensure consistency and accuracy (DeVellis, 2016), qualitative research demands alternative strategies that reflect the complexity of human experience.

Credibility, a central component of trustworthiness, is achieved when findings are interpreted from the participants' perspectives and researcher bias is minimised. This interpretive accuracy fosters confidence in the truth of the data (Lincoln and Guba, 1985, p. 121). Transferability, meanwhile, refers to the extent to which findings may be applied to other contexts. Providing rich descriptions of the research setting, methodology, and participant characteristics enhances this potential (Korstjens and Moser, 2018).

Triangulation emerges as a critical technique for reinforcing both credibility and transferability. By integrating multiple data sources, methods, or theoretical lenses, researchers can identify contradictions and gaps, thereby strengthening the coherence of their findings. Aguilar (2020) and Flick (1992) argued that triangulation not only validates data but also reveals tensions that might otherwise remain obscured. Yin (2009) suggests that the convergence of evidence across datasets whether aligned or divergent, creates an internally consistent framework that supports the transferability of results.

The current study, as outlined in Section 3.3.3, adopts a mixed methods design to address these concerns. Triangulation has been employed to enhance the completeness and confirmability of the dataset. This process includes comparing the study's outcomes with existing literature to assess the extent to which its conclusions resonate with prior investigations into similar phenomenon (Shenton, 2004; Polit and Beck, 2012). Ultimately, trustworthiness is not a static attribute, but a dynamic process shaped by methodological rigour, ethical sensitivity, and interpretive depth. Through triangulation and contextual transparency, this study seeks to produce findings that are both credible and transferable, contributing meaningfully to the broader discourse on food safety.

Ensuring the reliability of a research instrument is a critical component of methodological rigour. In this study, a pilot study was conducted involving the distribution of the full survey to a small group of online homemade food producers. The responses were analysed to determine whether the questions were interpreted as intended and whether the data collected was suitable for further analysis. This process allowed for the identification of issues related to clarity, structure and relevance, which were subsequently addressed in the revised version of the questionnaire. Van Wijk and Harrison (2013) emphasised that engaging participants in the evaluation of research instruments contributes to the production of high-quality data and enhances the validity of research outcomes.

Following the pilot test, the questionnaire was refined and subjected to a reliability assessment using Cronbach's alpha, a statistical measure introduced by Cronbach (1951) and widely used in social science research to evaluate internal consistency. Although there is ongoing debate regarding acceptable thresholds, values equal to or greater than 0.6 are generally considered sufficient for exploratory studies. Sekaran and Bougie (2010) and Ursachi et al. (2015) support this benchmark as a reliable indicator of internal consistency. In the context of this study, the application of Cronbach's alpha provided a quantitative basis for confirming the reliability of the survey items.

To ensure clarity and relevance in the interview process, the researcher first engaged three (3) food safety experts to review the semi-structured interview questions (see Section 4.3: Experts Review and Participation Selection for Pilot Study). Their feedback helped refine the content, structure and language of the questions, reducing the likelihood or misinterpretation due to syntax, vocabulary or acronyms. Following this preparatory stage, individual interviews were conducted online via Microsoft Teams, involving participants from fourteen (14) states across Malaysia. The interview guide was designed around open-ended questions which according to Christensen et al. (2011), are instrumental in capturing nuanced, subjective experiences. This approach enabled the collection of rich, detailed narratives that contribute to the trustworthiness and authenticity of the research findings.

Prior to the commencement of interviews, this study prioritised ethical transparency and participant comfort. A clear introduction was provided, outlining the independent nature of the research and affirming participants' right to not expose private and confidential information at any stage without the need to offer justification. This assurance aimed to reduce any potential apprehension regarding participation. The interview setting was designed to be supportive and respectful, informed by the research's familiarity with the food safety sector and an understanding of the professional challenges faced by participants. According to Shenton

(2004, p.66), such preparatory strategies are essential in fostering honesty and openness during qualitative data collection.

Ethical consideration formed the foundation of this study, aligning with contemporary expectations for transparency and accountability in research (Held, 2006; Haggerty, 2004; Zegwaard et al., 2017). To ensure methodological rigour, interviews were audio-recorded, transcribed, and translated into English, enabling detailed analysis and supporting the development of rich, contextual narratives (Bailey, 2008). This approach aligns with the concept of "thick description", which enhances the authenticity and reliability of qualitative findings (Geertz, 1973, as cited in Stahl and King, 2020, p. 26; Shenton, 2004). In the final phase, focus group discussions were conducted using open-ended questions to stimulate dialogue and uncover collective insights. Purposeful sampling ensured a range of perspectives, while neutral moderation facilitated equitable participation and accurate data capture (Blackstone, 2018; Sim, 1998).

3.8 Ethical Considerations

Ethical considerations are central to research involving human participants, particularly when primary data is collected. At the University of Sunderland, this study was reviewed and approved by the Faculty Research Ethics Committee (FREC), ensuring compliance with institutional standards for participant protection and methodological rigour (see Appendix 3.2 : Approval Letter).

The ethical framework guiding this research prioritised informed consent, confidentiality, and anonymity. Participants were fully briefed on the study's objectives and procedures through detailed information letters. Consent was obtained via signed forms, which explicitly outlined participants' rights, including the freedom to withdraw without penalty (Polonsky and Waller, 2011; Fleming and Zegwaard, 2018).

Survey data were collected using online platforms. Participants were provided with a secure survey link via email, WhatsApp, Facebook messenger or Instagram's direct message. All responses were stored securely on an external drive, with access to the raw data restricted solely to the researcher. Further details regarding the questionnaire as a research tool are presented in Section 3.4.1.

In the context of interviews and focus groups, ethical safeguards were reinforced through the use of coded identifiers, a practice recommended by Smyth and Williamson (2004) to preserve anonymity. Gillespie (1991) warns that lack of consent can lead to psychological discomfort, while Drew et al. (2008) and Cacciatolo (2015) argue that transparency throughout the research process fosters trust and mitigates negative emotional responses. By integrating these ethical principles, the study ensured that all participants were respected, protected, and fully informed throughout their involvement.

3.9 Survey – Stage I

This section presents the methodology adopted during the initial phase of the study including the design of the questionnaire, the selection of participants, the procedures for data collection and the approach to data analysis.

3.9.1 Questionnaire Design

Drawing on expert evaluations and pilot testing results (see chapter 4), the final questionnaire was carefully constructed to support the study's objectives. It began with an introductory section that explained the research purpose, invited participation and emphasised the confidentiality and anonymity of responses. The subsequent section included nine (9) multiple-choice items aimed at capturing demographic details. These questionnaires addressed the type of homemade food produced, the length of time participants had operated their online

businesses, the platforms used for sales, their roles within the business, any formal food safety training or certification held, educational attainment, gender, age category and business location. Hence, the demographic characteristics and general information were used to formulate the following hypotheses:

Hypothesis 1 : There is a significant difference in the duration of business operation among homemade food producers in relation to food safety governance.

Hypothesis 2 : There is a significant difference in homemade food producers' views on food safety governance based on the platform(s) used for their sales.

Hypothesis 3 : There is a significant difference in homemade food producers' views on food safety governance depending on the food safety qualification or training they have attained.

Hyphothesis 4 : There is a significant difference in homemade food producers' views on food safety governance based on their location of their business.

To measure food safety governance, a scale consisting of forty-one (41) items was developed and presented in third section of the questionnaire. These items were categorised into four (4) dimensions namely control, governance leadership and process (14 items); co-operation (7 items); communication (8 items); and competence (12 items). Participants were asked to indicate their level of agreement using a five-point Likert scale, ranging from Strongly Disagree to Strongly Agree (Likert 1932; Nemoto and Beglar 2014). The pilot study mirrored this structure to ensure consistency in data collection. A comprehensive overview of the questionnaire items and their alignment with the research objectives is provided in Appendix 3.3, while section 4.3 of chapter 4 offers a detailed analysis of the questionnaire's scope.

3.9.2 Reflecting on the Measurement of Food Safety Governance

As described above, the questionnaire was developed to examine food safety governance among homemade food producers. However, it is acknowledged that governance is a complex

and multidimensional construct. Food safety governance extends beyond individual knowledge and attitudes to encompass the broader systems, processes, relationships and mechanisms through which food safety expectations are communicated, implemented, monitored and influenced (Nyarugwe et al., 2020). In formal food industries, governance may be assessed through regulatory compliance records, audit outcomes, inspection frequencies or organisational policy frameworks. However, such indicators are often unavailable or inconsistent within the context of online homemade food producers operating in informal settings. This study therefore recognises the practical limitations associated with directly assessing formal governance arrangements within this population.

Consequently, this study adopts an operational perspective of food safety governance. Drawing upon the Enlightened Food Safety Culture Model (EFSCM) and the food safety governance literature, governance is examined through dimensions that influence how food safety expectations are translated into practice. These dimensions include control and governance leadership processes, cooperation, communication and competence. These dimensions represent the operational framework through which food safety governance is examined and experienced by homemade food producers.

It is recognised that certain questionnaire items may also reflect elements of food safety awareness, perceptions or attitudes. However, the purpose of the instrument was not to measure awareness or attitudes in isolation. Rather, these elements were considered relevant to understanding how governance mechanisms are understood, accepted and implemented by food producers. For example, competence reflects the capability to apply food safety requirements; communication reflects the dissemination and interpretation of food safety expectations; cooperation reflects engagement with relevant stakeholders; while control and governance leadership processes reflect structures that support food safety responsibilities, compliance and accountability. These dimensions are consistent with the EFSCM framework

underpinning the instrument, which identifies control, cooperation, communication and competence as important components of food safety practice (Griffith et al., 2010b; Jespersen et al., 2016).

The questionnaire should therefore be understood as measuring perceptions and experiences of food safety governance mechanisms rather than food safety awareness alone. This approach aligns with the exploratory nature of the study and the practical realities of investigating governance within a largely informal and dispersed population of homemade food producers in Malaysia. The questionnaire is consequently interpreted as one source of evidence concerning food safety governance, complemented by the semi-structured interviews and focus groups, which provide complementary evidence and a broader understanding of food safety governance within the study context.

3.9.3 Participations Selection and Sampling Technique - Stage I

As outlined in section 3.7, the target population for this study comprises online homemade food producers operating in Malaysia. These individuals typically run informal food businesses from home and market their products via social media platforms such as Facebook, Instagram and WhatsApp. Due to the absence of a centralised registry or formal database; unlike the Federation of Malaysian Manufacturers (FMM) for formal businesses, the exact number of such producers remain unknown. This lack of a sampling frame classifies them as a hard-to-reach or hidden population (Khoury, 2024).

Given these constraints, a non-probability sampling strategy was adopted, combining purposive and snowball sampling techniques. These methods are widely recognised as effective for accessing hidden populations especially when trust and social networks are essential for participation (Raifman et al., 2022). The research began by identifying participants through purposive sampling. This involved selecting individuals who met predefined criteria:

1) they must be actively selling homemade food online, 2) operate from a residential setting, and 3) have been in business for at least six (6) months. These participants were located through online searches, food-related Facebook groups and Instagram hashtags such as #homemadefoodMalaysia and #Malaysianfooddelivery. Purposive sampling is appropriate in this context as it allows the researcher to deliberately select participants who are most likely to provide rich, relevant and diverse insights (Valerio et al., 2016) into food safety practices and governance issues.

Following initial recruitment, a snowball sampling approach was employed. Early participants were asked to refer to other homemade food producers within their networks who met the study criteria. Snowball sampling is particularly effective in studies involving informal or stigmatised activities, as it leverages trust within social netwoks to enhance participation and data quality (Raifman et al., 2022). This method also helps overcome barriers such as reluctance to participate due to fear of regulatory scrutiny or lack of awareness about research (Khoury, 2024). Snowball sampling has been successfully used in food safety and public health research where formal lists of participants are unavailable.

Given an exploratory nature of the study and the lack of population data, the sample size was determined based on practical feasibility and conceptual saturation. 200 surveys have been distributed across 14 Malaysian states, targeting approximately 14-15 online homemade food producers per state. This approach ensures geographic diversity and reflects the decentralised nature of online homemade food businesses. While traditional sample size tables (e.g., Krejie & Morgan, 1970) are not applicable due to the unknown population size, this sample size is considered sufficient for exploratory research and aligns with practices in similar studies involving hidden populations (Guest et al., 2006).

3.9.4 Data Collection – Stage 1

Data collection for this study was conducted entirely online to reflect the informal and digitally active nature of the target population, which consists of online homemade food producers in Malaysia. As explained in Section 3.4.1, the questionnaire was designed using Microsoft Forms, to facilitate convenient distribution and efficient response tracking across multiple digital platforms.

Unlike traditional face-to-face distribution, the researcher directly approached known and familiar participants by sending the survey link via WhatsApp, Facebook Messenger, and Instagram Direct Message. These initial contacts were selected based on existing relationships and prior engagement with the researcher, ensuring a higher likelihood of participation and trust.

To broaden the reach and include a more diverse sample, the researcher also distributed the survey link within Facebook and Instagram groups specifically dedicated to homemade food producers in Malaysia. For instance, Bandar Saujana Putra Classifieds (Community), Penduduk Kepala Batas, PASAR KARAT ANAK PERLIS (PKAP) – Official, Penduduk Sungai Petani Kedah, Penduduk Alor Setar / Jitra, PerlisAktif, Penduduk Pulau Pinang & Seberang Perai, Komuniti Penduduk Putrajaya Cyberjaya Sepang, Kampung Jeram, Pasir Puteh, Kelantan and Komuniti Aparmen Presint 16 Putrajaya. These groups serve as informal communities where producers share menus, food safety tips, and business updates. This method aligns with snowball and purposive sampling strategies discussed in Section 3.9.2, allowing the researcher to access a hidden population through digital social networks (Valerio et al., 2016).

The questionnaire comprised forty-one (41) items across multiple sections (see Appendix 3.4 : Questionnaire / Survey Online Homemade Food Producers – Stage I) and all respondents

received the same format via Microsoft Forms. The survey was accessible via mobile devices and desktops, ensuring convenience and flexibility for participants.

Data collection was conducted over a period of approximately one (1) month and two (2) weeks, from July 28 to September 8, 2025. This duration allowed sufficient time for responses to be gathered from various regions and platforms. Reminders were periodically posted in the groups and sent to individual contacts to encourage participation and improve response rates. This digital approach was chosen not only for its practicality but also to reflect the online nature of the participants' businesses, ensuring contextual relevance and ease of access.

3.9.5 Data Analysis – Stage I

A structured framework was adopted to guide the data analysis process, ensuring clarity in the organisation and interpretation of findings (Sarker, 2021). The study utilised Statistical Package for Social Science (SPSS, Version 31.0) to perform statistical procedures aligned with the quantitative research design outlined in Section 3.3.1. Descriptive statistics, specifically the mean and standard deviation, were applied to summarise the dataset (Hantrais, 2009). To evaluate the research hypotheses, independent t-test and ANOVA were conducted, with post hoc analysis used to identify specific group differences.

3.10 Semi-Structured Interviews – Stage II

The second phase of this research involved a multi-step methodological process. It began with the selection of participants, followed by the collection of qualitative data. Subsequently, an interview guide was developed and refined through expert review, which contributed to its final version. The section concludes with a descriptive of the analytical procedures used to interpret the data.

3.10.1 Development of Interview Guide and Expert Reviews – Stage II

To ensure the integrity and clarity of the semi-structured interview guide, the researcher adopted a multi-stage validation process. The initial draft was prepared in both Malay and English, reflecting the linguistic diversity of the participants. Expert reviewers fluent in Malay were engaged to assess the phrasing, syntax, and semantic accuracy of the translated questions. Their feedback confirmed that the translation retained the intended meaning and avoided linguistic errors. During the interviews, participants predominantly responded in Malay, and the researcher, well-versed in the subject matter, undertook the task of transcribing and translating responses into English. No inconsistencies were observed in this process.

The interview guide was structured into three (3) distinct phases. Phase one (1) focused on establishing rapport and gathering demographic information. The researcher began each session with a brief introduction, explaining the interview's purpose and expected duration (approximately 45 minutes). Participants were informed about the use of a digital voice recorder and the requirement to sign a consent form. Introductory questions followed, aimed at profiling participants: job title, location of workplace, years of experience in food safety, highest qualification, and whether they had undergone formal training in food safety governance or policy enforcement.

Phase two (2) comprised three (3) core survey questions derived from the literature review and aligned with the study's research objectives. Nine (9) induction questions were initially presented, focusing on business registration and traceability, food preparation and safety standards, and the implementation of SOPs and guidelines. These were followed by fifteen (15) semi-structured questions designed to investigate four (4) key factors influencing food safety governance. One (1) final question invited participants to propose recommendations for enhancing food safety governance among homemade food producers. The researcher concluded each interview by expressing gratitude for the participant's cooperation.

Phase three (3) involved expert validation. Three (3) professionals from the researcher's network were selected to review the interview guide. One (1) expert brought over 25 years of experience in food safety, while the other two (2) had more than a decade of expertise in food security, innovation and development research. After receiving verbal consent, the researcher provided each expert with an interview guide. A seven-day (7) review period was allocated (September 9 to 17, 2025), after which the researcher followed up via WhatsApp text or call to collect feedback.

The experts endorsed the strategy of beginning interviews with general questions to foster participant comfort. They also recommended maintaining the interview duration between 45 minutes and one hour. One expert proposed the inclusion of Likert-scale items in the introductory section and suggested ending the interview with an open invitation for participants to share additional insights. This approach was intended to capture any overlooked or significant perspectives.

Following expert review, the final interview guide comprised thirty (30) questions as shown in Appendix 3.5 Final Interview Guide – Stage II. Detailed mappings between research objectives and interview questions are provided in Appendix 3.6.

3.10.2 Participants Selection and Sampling Technique – Stage II

Participants for the interviews were recruited fourteen (14) Food Technologists working within the FSQD, MOH Malaysia. This selection was made to ensure representation from each of Malaysia's 14 states as these officers are directly involved in monitoring, enforcing and implementing food safety policies as well as regulations at state level. Their roles equip them with comprehensive insights into the governance of homemade food producers including current standards, guidelines and enforcement practices.

The decision to include one (1) food technologist per state was guided by the need to capture diverse regional perspectives on food safety governance. This approach aligns with Griffith, Livesey and Clayton (2010) as well as Griffith (2014) assertion that food safety opinions and practices vary across different organisational levels and geographical locations and that collecting views from multiple sources enhances the reliability of findings. Interviewees were selected from various professional levels including managerial and executive roles provided they were actively involved in policy implementation, monitoring and enforcement related to homemade food operation or production. All participants were aged 18 years or older, in accordance with ethical approval requirements.

A combined sampling approach was employed, incorporating elements of purposive sampling and snowball sampling. Purposive sampling was used to deliberately select individuals who possessed specific expertise relevant to the research objectives; namely those responsible for food safety governance at the state level (Patton, 2015). This method is particularly suitable for exploratory research where in-depth understanding from information-rich cases is required (Ahmad and Wilkins, 2024, p. 5).

Following initial contact with selected officers, snowball sampling was used to identify additional relevant personnel within their networks who met the inclusion criteria and were willing to participate. Snowball sampling is especially effective in accessing specialised populations and is widely used in qualitative research to build trust and expand sample reach (Naderifar et al., 2017). This sampling strategy was chosen to ensure that the study captured a comprehensive and nuanced understanding of food safety governance across Malaysia, reflecting both policy-level and operational perspectives.

3.10.3 Data Collection – Stage II

The data collection process for this study involved interviews with Food Technologist Officers from all 14 Malaysian states. These officers, responsible for overseeing homemade food producers, were selected using purposive sampling to ensure institutional and geographical diversity. As noted by Guest, Bunce and Johnson (2006), qualitative studies may reach saturation with as few as twelve (12) interviews, while Hagaman and Wutich (2017) argue that identifying meta-themes may require up to fourty (40). Given the uniformity of roles among participants, 14 interviews were considered sufficient.

Each participant received a consent form prior to the interview, which outlined the study's purpose, ethical considerations and confidentiality measures. Only those who signed the form were included. Interviews were conducted in Bahasa Malaysia and lasted between fourty-five (45) minutes and one (1) hour. A semi-structured guide comprising thirty (30) questions was used, with flexibility in question order to accommodate conversational flow. Probing techniques were applied to elicit detailed responses.

Initially, Microsoft Teams was used to conduct the interviews, chosen for its formal and secure environment. However, technical challenges emerged in regions such as Sabah, Sarawak and Terengganu, where heavy rainfall disrupted internet connectivity. In response, the researcher transitioned to WhatsApp video calls towards the end of these sessions. This shift was made possible by participants' prior provision of personal WhatsApp numbers, following the consent process. WhatsApp's widespread use among Malaysian civil servants facilitated immediate communication and helped maintain rapport.

To ensure data integrity, a dual recording method was adopted. Teams' built-in recording function and an external voice recorder were used during initial sessions, while WhatsApp calls were recorded separately when necessary. This approach minimised the risk of data loss due to

unstable connections. Data collection took place over ten (10) days, from September 23 to October 2, 2025, with all audio recordings transcribed verbatim for analysis.

3.10.4 Data Analysis – Stage II

Thematic analysis, as discussed in section 3.3.2, will guide the identification and interpretation of patterns within the qualitative data (Braun and Clarke, 2006; Nowell et al., 2017). Prior to analysis, interview recordings will be transcribed and translated into English to ensure consistency. NVivo (Version 14) will support the thematic organisation of the data and provide a robust platform for qualitative coding (Depoy and Giltin, 2019). Codes will be developed using case-based classifications and attributes, particularly demographic categories. To deepen analytical insight, the researcher will employ NVivo's visualisation tools, including project maps, charts and hierarchy diagrams which will illustrate key findings (Jackson and Bazeley, 2019).

3.11 Focus Group – Stage III

The preceding section detailed the methodology adapted for the focus group discussion. This involved the formulation of targeted questions, the identification of suitable participants based on defined criteria and the execution of a consistent data collection process. As discussed in the preceding section, these components collectively ensured the reliability and relevance of the qualitative data.

3.11.1 Focus Group Question

To ensure a robust and inclusive discussion, the researcher first prepared a bilingual focus group guide in both English and Malay, mirroring the approach taken in earlier phases of the study. The translated questions underwent expert review by a native Malay speaker, with

particular attention paid to the consistency of phrasing, syntax and overall comprehensibility. This review process confirmed that the translated questions aligned fully with the original question, with no inconsistency detected.

At the outset of each focus group session, participations were welcomed and briefed on the objectives and procedures. They were then invited to complete a demographic question, which gathered information such as name (optional), gender, age, state of residence or work, job role and years of experience in food business or food safety. The main discussion followed, structured around five (5) open-ended questions are detailed in Appendix 3.7 and the scope of the questions, along with the developed subthemes is provided in Appendix 3.8. Appendix 3.9 presents the mapping of focus group interview questions to the research objectives and food safety governance dimensions.

3.11.2 Participant Selection and Sampling Technique – Stage III

All participants had previously completed the survey and interview phases. The decision to reuse these individuals was informed by both practical constraints and methodological considerations.

Recruitment for focus groups presented notable challenges, particularly among homemade food producers. Many expressed reluctance to participate further, citing concerns such as privacy, fear of judgement, time commitment and logistics difficulties. Unlike one-to one interviews, focus groups require participants to share opinions in a group setting, which can lead to discomfort when discussing sensitive topics (Sim and waterfield, 2019). Additionally, the unpredictability of group dynamics and the potential for over-disclosure can heighten ethical risks, making some individuals hesitant to engage.

Time commitment and coordination also posed barriers. Focus groups demand synchronous availability, which can be difficult for participants with personal or professional obligations

(Gross and Gelman, 2025). These limitations are particularly pronounced in populations that are hard to reach or vulnerable (Gross and Gelman, 2025), such as homemade food producers, who may mistrust research processes or perceive limited personal benefit from participation. Given these constraints, reusing participants from earlier stages of the study was a strategic and ethically sound decision. These individuals had already established rapport with the researcher, which facilitated a more open and trusting environment during group discussions (Katz-Buonincontro, 2022). Their prior engagement also endured that they were well informed about the study's aims and procedures, reducing the risk of misunderstanding or discomfort.

From a methodological perspective, reusing participants supports data continuity and enhances the depth of analysis. It allows for triangulation across multiple qualitative methods, strengthening the validity of findings (Chioncel et al., 2023). This approach aligns with recognised practices in qualitative research where purposive sampling is used to select individuals with relevant experience and insight (Islam and Aldaihani, 2022). Moreover, it respects participants' willingness to contribute without imposing additional burdens on new individuals, thereby upholding ethical standards of voluntary participation and minimising harm (McLeod, 2024).

To facilitate the focus group discussion, the researcher first identified a date that would suit multiple participants. This scheduling was based on the availability of individuals who had responded positively to an invitation sent via WhatsApp, either through a call or message. Once a mutually convenient date was established, the researcher proceeded to form a group consisting of participants who could attend on that specific day. This approach was found to be the most feasible given the logistical constraints.

3.11.3 Data Collection – Stage III

In this study, three (3) focus groups discussion were conducted. These comprised one (1) group of homemade food producers (n = 5), one (1) group of Food Technologists (n = 5), and one (1) mixed group consisting of both homemade food producers and Food Technologists.

Each focus group session lasted between one (1) hour and thirty (30) minutes and was designed to foster a permissive, non-threatening environment where participants could share their views freely. The reuse of known participants contributed to the richness of the data and ensured that the discussions remained relevant to the study's objectives.

Focus group discussions were held over a seven (7) days period, from September 4 to 10 September 2025, using Microsoft Teams. The researcher acted as moderator and began each session by outlining the discussion process and objectives. Participants were informed that there were no right or wrong answers and were encouraged to share their views on homemade food safety practices, policies and guidelines.

All sessions were conducted in Malay language and recorded with participants' consent. Prior to each discussion, consent was obtained via WhatsApp text and call. Participants were also asked to provide demographic and general profile information, which was recorded and documented by the researcher. These details were essential for understanding how individual characteristics may have influenced participants' perspectives on the research topic.

3.11.4 Data Analysis – Stage III

Thematic analysis formed the foundation of the data interpretation process, mirroring the analytical approach adopted during the interview phase (Braun and Clark, 2006; Nowell et al., 2017). To prepare the data, recorded conversations were first transcribed and translated into English. NVivo software (Version 14) was then utilised to manage and analyse the data. Each

focus group was treated as a separate analytical unit, with findings presented through visual formats such as project maps and demographic charts (Jackson and Bazeley, 2019).

3.11.5 Chapter Summary

This chapter explains the research design and methodological rigour underpinning the study. It justifies the adoption of a pragmatic philosophical stance, integrating ontological and epistemological considerations to generate practical research outcomes. A mixed-methods approach was applied to support methodological triangulation, using surveys, semi-structured interviews and focus groups. Participant recruitment combined convenience, snowball and purposive sampling, while expert review and pilot testing ensured the robustness and validity of the instruments. The subsequent chapters present the findings, beginning with the pilot study and followed by the survey, interview and focus group results.

CHAPTER FOUR
PILOT STUDY

4.1 Chapter Structure and Content

Pilot studies play an important role in research design by identifying and addressing potential methodological challenges prior to full-scale data collection. As noted in the literature, they support the refinement of sampling strategies, data collection methods, and research instruments, thereby enhancing reliability and validity. An important component of this process is content validity, which ensures that questionnaire items appropriately measure the intended constructs. Building on the methodological framework established in Chapter 3, a pilot study was conducted for this research. Subject-matter experts reviewed the questionnaire for clarity, relevance, and alignment with the research objectives. Their feedback informed revisions that strengthened the overall rigour and suitability of the instrument for broader application.

4.2 Design of Questionnaire

This pilot study employed an online survey consisting of three (3) main sections, designed to explore food safety governance among online homemade food producers in Malaysia. The questionnaire was bilingual (English and Malay) to ensure clarity and inclusivity for all participants.

The first section (Section A) included ten (10) multiple-choice questions and one open-ended item to gather demographic and background information. Questions covered type of homemade food produced or sold (e.g., traditional Malay, Chinese, Indian, Western, baked goods, beverages), duration of business operation, online platforms used for selling food (e.g., Facebook, Instagram, GrabFood, ShopeeFood), role in the business (e.g., owner, co-owner, helper), formal food safety training or certification, highest level of education, gender and age

range, state of business operation in Malaysia. The second section (Section B) aimed to assess food safety culture among homemade food producers through 41 Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree), adapted from relevant literature (Likert, 1932; Nemoto & Beglar, 2014). The items were grouped into four (4) key dimensions:

Control / Governance / Leadership / Process : Fourteen (14) items evaluating personal responsibility, prioritisation, planning, and responsiveness to food safety issues, including record record-keeping and hygiene practices.

Co-operation : Seven (7) items assessing collaboration, openness to feedback, access to guidelines, and shared responsibility in maintaining food safety.

Communication : Eight (8) items: focusing on how producers communicate food safety information to customers and helpers, respond to unsafe practices and engage with feedback and updates.

Competence : Twelve (12) items measuring understanding of food safety risks, training experiences, application of safety principles, and attitudes toward continuous learning and improvement.

To complement the quantitative data, the third section (Section C) included open-ended questions exploring deeper insights into food safety governance. Topics covered motivations and challenges in maintaining food safety, support received from authorities, collaboration with others in food handling, communication practices with customers, training experiences and resource needs, suggestions for improving food safety practices and support mechanisms. Building on these initial qualitative inputs, semi-structured interviews with homemade food producers were incorporated into the study design for several key reasons;

4.2.1 Complementarity of Data

The semi-structured interviews were included to complement the survey responses by providing deeper insights into the lived experiences, challenges, and perceptions of homemade food producers regarding food safety governance. While the survey captured structured attitudes and practices, the interviews allowed participants to elaborate on their motivations, barriers, and suggestions in their own words.

4.2.2 Pilot Testing Interview Questions

Including a few open-ended questions in the pilot survey also served to test the clarity and relevance of the interview prompts before conducting full interviews with food technologists. This helped refine the qualitative tools and ensured they were contextually appropriate.

4.2.3 Exploratory Nature of the Study

As this is an exploratory study, the inclusion of qualitative elements aligns with the goal of uncovering nuanced understandings and emerging themes that may not be captured through closed-ended survey items alone.

4.3 Expert Review and Participation Selection for Pilot Study

The pilot study incorporated both expert validation and participant feedback to enhance the quality and relevance of the research instruments. According to Patton (2003), purposive sampling is appropriate for selecting individuals with specific expertise or experience relevant to the research context. In this study, three experts from the researcher's professional network were invited to review the interview guide and questionnaire. One expert had over 25 years of experience in food safety, while the other two brought more than ten years of knowledge in

food security, innovation, and development. Their feedback, submitted within a nine-day timeframe, focused on the clarity, relevance, and contextual appropriateness of the items.

To complement expert input, twenty (20) volunteer participants were recruited from among online homemade food producers in Malaysia. This sample size aligns with recommended practices for pilot studies in social science research, which suggest a range of 10 – 30 participants for initial testing (Johnson and Brooks, 2009). These individuals were randomly selected based on their business profiles, which were publicly advertised on Facebook and Instagram. Contact was initiated through various channels, including direct messaging, comment sections, and WhatsApp numbers listed on their social media pages. Communication was conducted via text and phone calls. Participants were informed of the study's objectives and assured of anonymity and confidentiality. They were asked to review the questionnaire and provide feedback within nine days, particularly regarding its design, readability, and the open-ended questions in Section C. To avoid duplication and ensure the integrity of the main study, pilot participants were excluded from subsequent data collection.

4.3.1 Triangulation

Using both survey and interview data supports triangulation, enhancing the validity of findings by cross-verifying information from multiple sources.

4.4 Data Collection

A web-based questionnaire platform (Microsoft Forms) was selected for both expert review and pilot survey distribution, offering a streamlined and accessible method for data collection. The pilot study commenced with the involvement of experts in food safety as well as food security and innovation research. Their participation was confirmed via WhatsApp, after which the survey link was emailed directly to them. Over a seven-day (7) period (September 9 –17

2025), they were invited to evaluate the questionnaire's design, including item clarity and relevance. To ensure comprehensive feedback, the researcher followed up through WhatsApp and telephone calls.

In parallel, the pilot survey targeting online homemade food producers was launched. Given the digital nature of their business operations, the researcher distributed the Microsoft Forms link through WhatsApp, Instagram direct messages, Facebook Messenger, and comment sections on their social media pages. The pilot remained active for a designated period, enabling the researcher to assess the survey's usability and refine its content based on participant responses.

4.5 Results

Experts Review : The pilot questionnaire underwent a comprehensive review by academic experts from Malaysian and United Kingdom (UK) universities, many of whom are engaged in research on food safety as well as food security and innovation. Their experience working with Ministry of Health Malaysia officers provided them with a nuanced understanding of the informal food sector's regulatory landscape. According to the reviewers, the constructs embedded in the questionnaire namely governance, communication, cooperation, and competence are conceptually robust and practically applicable (Armstrong, 1999). These dimensions, they noted, reflect the principles of established food safety frameworks such as HACCP and ISO 22000, and are suitable for both formal and informal food production settings. In addition to content validation, the reviewers suggested design enhancements to improve user experience. For example, colour-coded sections were proposed to help respondents navigate the questionnaire more easily, particularly on mobile devices. These recommendations were implemented in the final version to support clarity, accessibility and data integrity.

Participant's Comments : Participants in the pilot study, drawn from a range of Malaysian states, represented a diverse array of online homemade food producers. Their businesses span traditional cuisine, baked goods, beverages, and health-focused meals. The feedback received was pivotal in refining the questionnaire to better reflect the informal nature of their operations. Design-related feedback was also constructive. Participants appreciated the structured demographic section, which included predefined options for food types, business roles, and commonly used online platforms. This format improved the survey's accessibility, especially for mobile users.

Specific suggestions led to targeted revisions. In the communication section, one of two similar items was removed to avoid redundancy. In addition to this, the estimated completion time of 15 minutes was validated by actual response data, with most participants completing the survey within 20 minutes. This confirmed the questionnaire's suitability for its target population or audience.

4.6 Chapter Summary

Following the literature review, this chapter introduces the pilot study undertaken to test the initial questionnaire, which was structured around four (4) thematic domains. To ensure content validity, the instruments was reviewed by three (3) academic experts based in Malaysia and United Kingdom (UK), each with experience in food safety governance. Their evaluation confirmed the conceptual relevance of the items and their alignment with the study's aims. In parallel, feedback from pilot participants informed practical revisions to the questionnaire, particularly regarding clarity, layout, and ease of completion. These insights were essential in shaping more refined and accessible instruments. The revised version was subsequently deployed in the first stage of the study, the results of which are discussed in the next chapter.

CHAPTER FIVE
DATA ANALYSIS AND RESULTS

5.1 Chapter Structure and Content

This chapter presents the findings from the three stages of data collection: the questionnaire survey, semi-structured interviews, and focus group discussions. Section 5.2 reports the quantitative survey findings, including respondent characteristics and hypothesis testing. Section 5.3 presents the semi-structured interview findings with Food Technologists, highlighting key themes related to food safety governance. Section 5.4 reports the focus group discussion findings involving home-based food producers and Food Technologists, providing further insight into the challenges and strategies associated with food safety governance. Together, these findings provide a comprehensive understanding of food safety governance within Malaysia's home-based food sector.

5.2 Results of Survey

This section reports the survey findings and outlines the procedures used for data analysis. Data were analysed using SPSS software (version 31.0). The response rate is presented first, followed by data screening procedures, including checks for missing values, outliers, and normality. The demographic characteristics of respondents are then described. The section subsequently evaluates the measurement model through assessments of construct validity and internal consistency. Finally, hypothesis testing is conducted using independent samples t-tests and analysis of variance (ANOVA) with post hoc comparisons to examine differences across groups.

5.2.1 Data Description

As outlined in Section 3.7, the target population for this study comprises online homemade food producers operating in Malaysia. Given the exploratory nature of the study and lack of population data, the sample size was determined based on practical feasibility and data saturation. A total of 200 surveys were distributed across fourteen (14) Malaysian states, targeting approximately 14-15 online homemade food producers per state. Out of the 200 survey distributed, a total of 120 responses were collected, resulting in a response rate of 60%. Data collection was conducted over a period of one (1) month and two (2) weeks using Microsoft Forms, which was shared with respondents via WhatsApp and other social media platforms. Prior to the analysis of the survey questionnaire, the data from Microsoft Forms were exported into (SPSS version 31.0) for statistical analysis.

Upon completion of the data collection stage, the dataset was examined for completeness and missing values. During this review, it was found that fifteen (15) questionnaires contained missing data exceeding approximately 10% of the construct or variable measurement. According to Hair, Money, Samouel, and Page (2007), questionnaires with missing data exceeding 10% of the total response should be excluded. Consequently, these 15 cases were omitted from the preliminary analysis.

Following this elimination, one hundred and five (105) usable questionnaires remained in the SPSS database for further analysis. This sample size meets the criteria for conducting quantitative research. As noted by Sekaran (2010), a sample size larger than thirty (30) and less than five hundred (500) is considered adequate for most studies. Therefore, the effective sample size of 105 is deemed valid and satisfactory for the purposes of this research. Table 5.1 constitutes the response rate for this study.

Table 5.1
Response Rate

Response	Frequency
Number of distributed questionnaires	200
Total returned questionnaire	120
Response rate	60%
Usable and completed questionnaires	105
Effective response rate	52.5%

In accordance with the respected Table 4.1, an effective response rate of 52.5% was obtained from this study. As highlighted by Anseel, Lievens, and Schollaert (2010), response rates below 50% are common when surveys target individuals in managerial or representative roles within organisations. However, in this study, the questionnaire was distributed to online homemade food producers, including owners, co-owners, and helpers who are actively involved in the day-to-day operations of informal food businesses.

Unlike formal food industries where multiple departments may receive several questionnaires, this study adopted a one-to-one distribution approach, where each producer received a single questionnaire. Despite the informal nature of these businesses and the challenges associated with reaching a hidden population, the study achieved a total response rate of 60%, with 105 usable and completed questionnaires, resulting in an effective response rate of 52.5%. Therefore, the response rate achieved in this study is considered satisfactory.

5.2.2 Data Screening

Data screening encompasses several essential procedures including the identification of missing values, the detection of outliers and the normality test. These steps are crucial to ensure that the characteristics of the dataset do not unduly influence the study's findings. Prior to conducting the data screening, all questionnaire items containing negatively worded statements were reverse coded. This adjustment is necessary because such items, although intended to

minimise response bias, must be aligned with positively worded items to maintain consistency in analysis. Failure to reverse code these items may lead to distorted results particularly in reliability assessments such as Cronbach's alpha or when calculating composite scores.

5.2.2.1 Missing Data

Missing data is a well-documented challenge in empirical research. As Coakes (2013) notes, obtaining a fully complete dataset across all questionnaires is seldom achievable. This limitation stems from respondents' failure to provide answers to one or more items, often due to uncertainty or lack of familiarity with the content (Sekaran and Bougie 2009). Consequently, valid values may be absent, which can hinder the accuracy of data analysis (Hair et al. 2010, p.42).

In the present study, this issue manifested in 15 questionnaires, each containing missing values. These omissions directly impacted the dataset, reducing the number of usable cases from 120 to 105. Recognising and addressing missing data is therefore a vital component of the data screening process, ensuring the integrity and reliability of subsequent analyses.

5.2.2.2 Detecting Outliers

The detection of outliers constituted the second step in the data screening process. Outliers are defined as extreme values that fall outside the expected range and may influence the outcomes of data analysis (Zikmund et al. 2010). In this study, outlier detection was conducted to minimise any potential adverse effects on the findings. One method employed was the use of box plots in SPSS, where outliers are indicated by small circles accompanied by case ID numbers (Pallant 2013). To confirm these cases as outliers, further criteria were applied; 1) cases with scores three or more box lengths from the edge are marked with an asterisk, 2) while those between one and a half and three box lengths are considered outliers (Coakes and Ong

2011; Coakes 2013; Pallant 2016). No extreme scores were identified in this study. Table 5.2 summarises the detected outliers.

Table 5.2
Summary of Outliers (n=105)

Variable	Outlier Cases
Food Safety Governance	Q46, Q84, Q100
Co-operation	None
Communication	None
Competence	Q84

Outliers were also assessed using standard scores (z-scores). For sample sizes of 80 or fewer, values exceeding +/- 2.5 are considered outliers, while for samples larger than 80, the threshold is +/- 3.00 (Kumar et al. 2013, p.58; Meyers et al. 2006, p.171). In this study, three (3) cases specifically Q46, Q84 and Q100 exceeded the +/- 3.00 threshold and were therefore classified as outliers. As recommended by Pallant (2013), these cases were removed to prevent distortion of the results. The final dataset comprised 102 valid cases, suitable for further analysis (Hair et al. 2010).

5.2.2.3 Test of Normality

Following the removal of three outlier cases, the remaining 102 valid responses were subjected to a normality assessment using SPSS version 31.0. The evaluation involved examining skewness and kurtosis values, alongside the Kolmogorov-Smirnov test. According to Meyers, Gamst and Guarino (2013, pp. 140–141), values of skewness and kurtosis within the range of -1 to +1 are considered acceptable for a normal distribution. As shown in Table 5.3, all variables in this study fall within this range, indicating that the data are normally distributed.

Table 5.3
Normality Test : Skewness and Kurtosis Statistic (n=102)

Variable	Skewness	Kurtosis	Description of Distribution
Food Safety Governance	-0.320	-0.471	Normal Distribution
Co-operation	-0.293	-0.325	Normal Distribution
Communication	0.151	-0.700	Normal Distribution
Competence	-0.342	0.062	Normal Distribution

With reference to Table 5.3, the data was confirmed to be normally distributed. This conclusion was initially supported by the skewness and kurtosis values, which remained within the acceptable range of +/- 1.00. Following this, the Kolmogorov-Smirnov test was conducted to further assess the assumption of normality. According to Field (2024), this test is suitable for larger sample sizes, particularly those exceeding 100 observations, such as in this study (n = 102). Although the Shapiro-Wilk test is often recommended for smaller samples, the Kolmogorov-Smirnov test remains a valid and widely accepted method for evaluating normality in larger datasets (Coakes, 2013). A variable is considered normally distributed when the significance value exceeds 0.05 (sig>0.05). As shown in Table 5.4, all variables met this criterion, thereby supporting the assumption of normality.

Table 5.4
Normality Test : Normality test : Kolmogorov-Smirnov (K-S) Values (n=102)

Variable	Kolmogorov-Smirnov		Result
	Z	Significant	
Food Safety Governance	0.119	0.010	Normal
Co-operation	0.118	0.012	Normal
Communication	0.121	0.009	Normal
Competence	0.080	0.200	Normal

The assumption of normality was assessed prior to hypotheses testing. As shown in Table 5.4, the significance values ($p>0.05$) for all four (4) variables namely; Food safety governance, co-operation, communication and competence were greater than 0.05. This result indicates that the data were normally distributed, satisfying the conditions required for parametric analysis. According to standard statistical guidelines, when the normality assumption is met, parametric test are appropriate for hypothesis testing.

5.2.3 Demographic Information

This section presents the demographic background of the respondents alongside key information about their respective homemade food businesses. A total of 102 individuals participated in this study. The data concerning respondent profiles and company characteristics were analysed using frequency analysis. The results were illustrated through pie charts, each labelled with corresponding percentage values to enhance clarity. This visual representation enabled a clear depiction of demographic distributions. Furthermore, the percentage data facilitated comparisons between the lowest and highest response rates across the survey items.

5.2.3.1 Type of Homemade Food Produced

Respondents reported producing a diverse range of food items. Traditional Malay dishes accounted for the largest share (25%), followed by baked goods and pastries (20%) and snacks and finger foods (15%). Other categories included Chinese dishes (10%), Indian cuisine (8%), Western food (7%), frozen or ready-to-cook meals (5%), and healthy or diet-specific options (10%) as shown in the figure 5.1. This variety reflects Malaysia's multicultural culinary landscape and the adaptability of producers to consumer preferences.

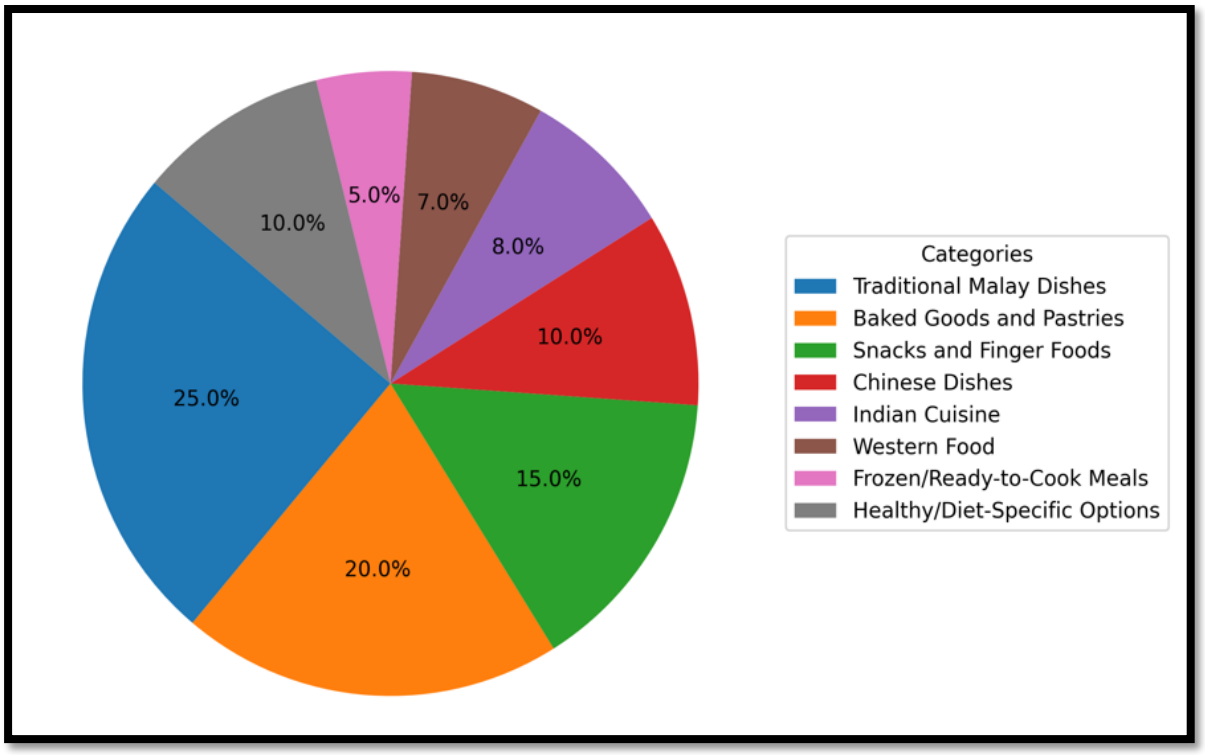


Figure 5.1
Type of Homemade Food Produced by Respondents

5.2.3.2 Duration of Business Operation

In accordance with the figure 5.2 below, the length of time respondents have operated their businesses varied considerably. More than five (5) years was the most common category (35%), followed by three to five years (30%), one to two years (25%) and less than one year (10%). This indicates a mix of experienced and relatively new entrants in the homemade food market.

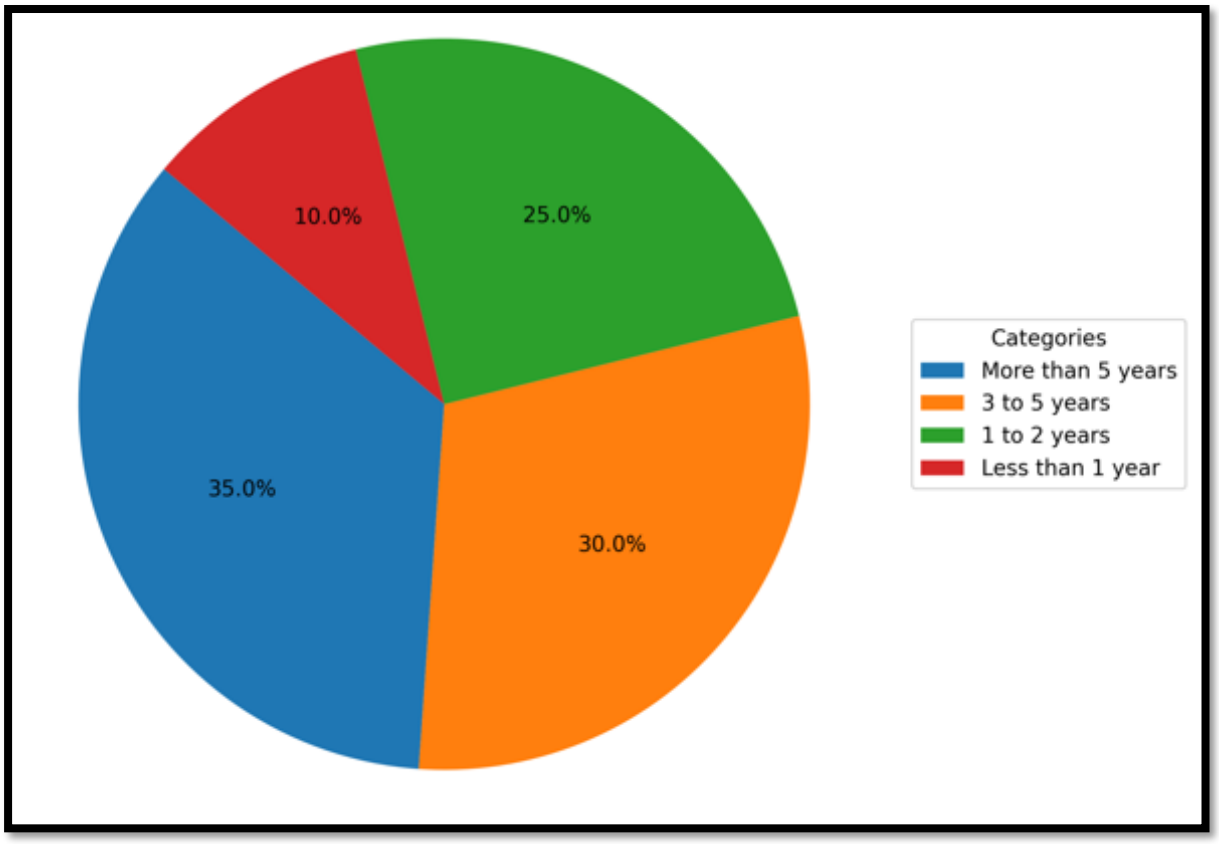


Figure 5.2
Duration of Business Operation among Respondents

5.2.3.3 Platform Used for Selling

Social media platforms dominate sales channels for homemade food producers. As summarised by the figure 5.3, Facebook was the most frequently used platform (40%), followed by Instagram (30%), WhatsApp (15%), TikTok (10%), and other platforms (5%). This highlights the reliance on digital platforms for marketing and customer engagement.

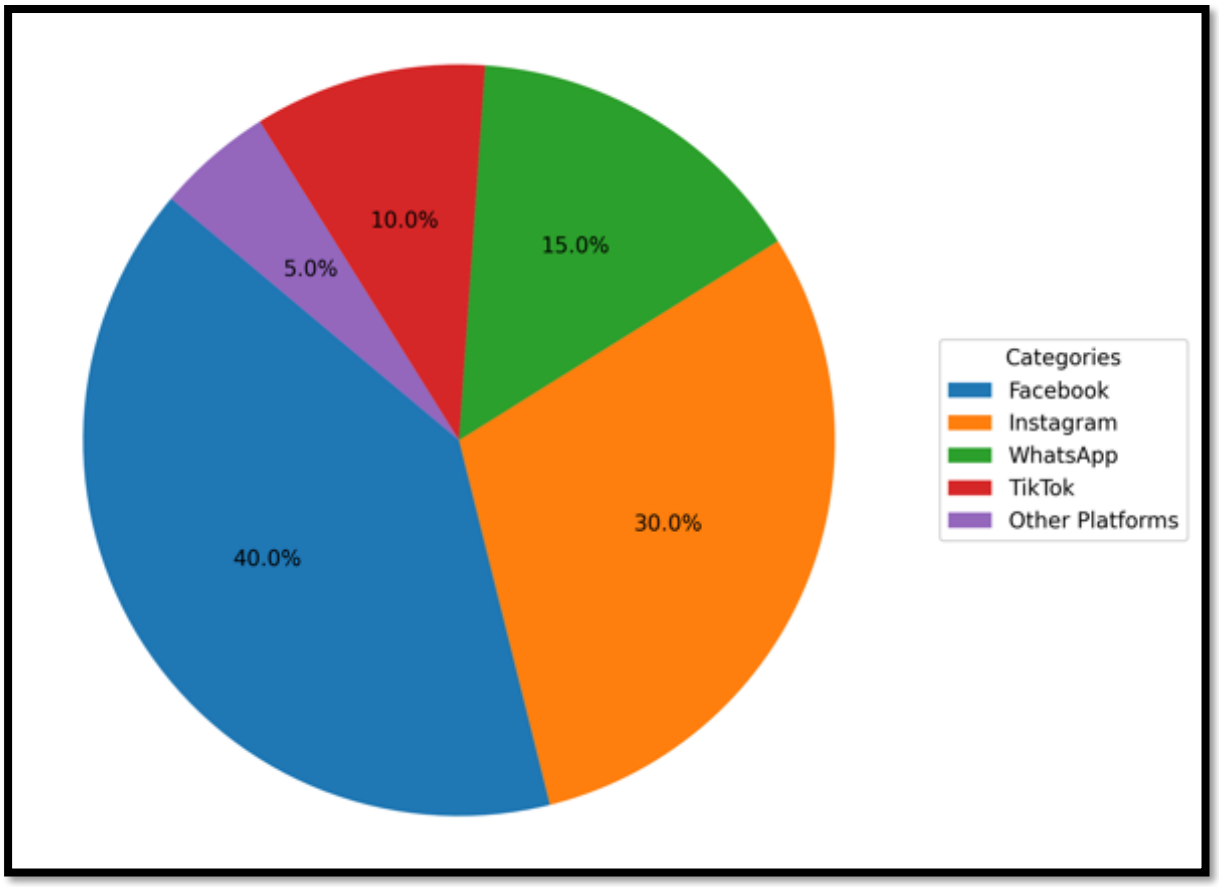


Figure 5.3
Digital Platforms Used for Selling Homemade Food

5.2.3.4 Role in Business

The majority of respondents identified as owners, representing 60% of the sample, followed by co-owners (20%), helpers (15%), and others (5%). Hence, the following figure shows that this distribution reflects the dominance of owner-managed operations in the homemade food sector, where decision-making and food safety responsibilities are concentrated at the top level.

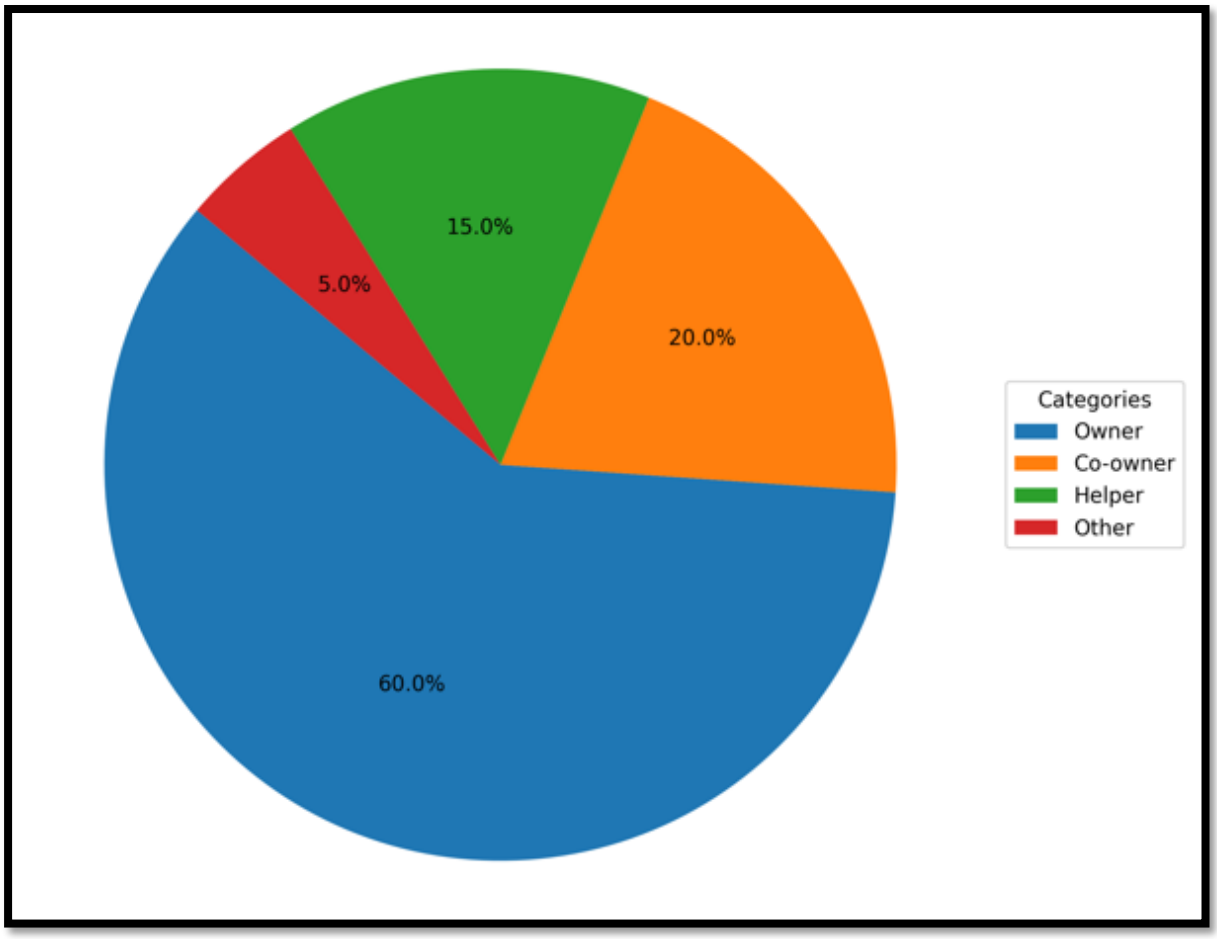


Figure 5.4
Role of Respondents in the Business

5.2.3.5 Food Safety Training

The results presented in figure 5.5 indicate that the findings align with the researcher's expectations. A significant proportion of respondents (65%) reported having no formal food safety training, while 35% indicated they had received training. This finding highlights the need for structured food safety education among homemade food producers.

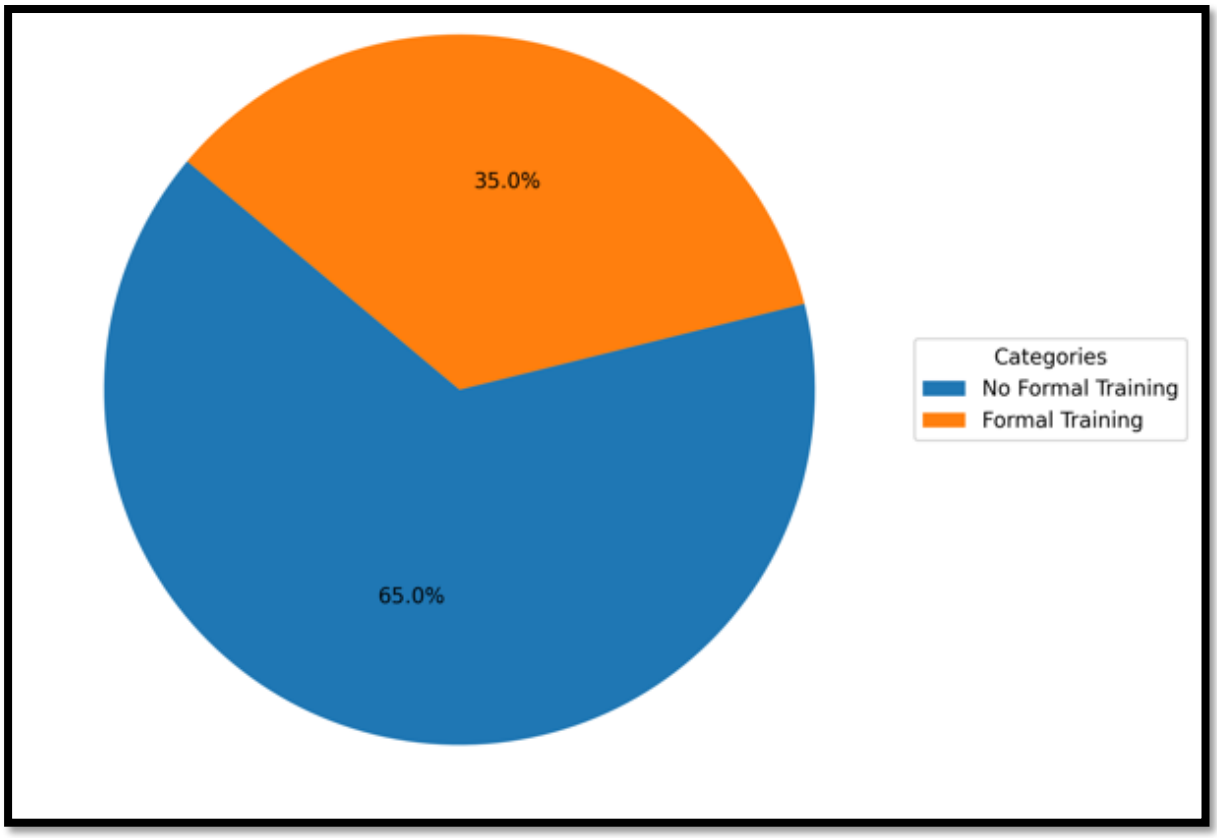


Figure 5.5
Food Safety Training Status of Respondents

5.2.3.6 Education Level

As shown in Figure 5.6, most respondents (83%) reported completing tertiary education, while 17% indicated education up to secondary level. No participants reported only primary education or no formal education.

This indicates that the majority of producers possess at least a basic educational foundation, which may influence their understanding of food safety practices. However, this finding contrasts with the initial expectation that individuals with no formal education would form a notable proportion of participants, given the accessibility of online food business operations. The absence of such responses suggests a potential participation gap and indicates that higher education may play a more significant role in enabling engagement in online homemade food businesses.

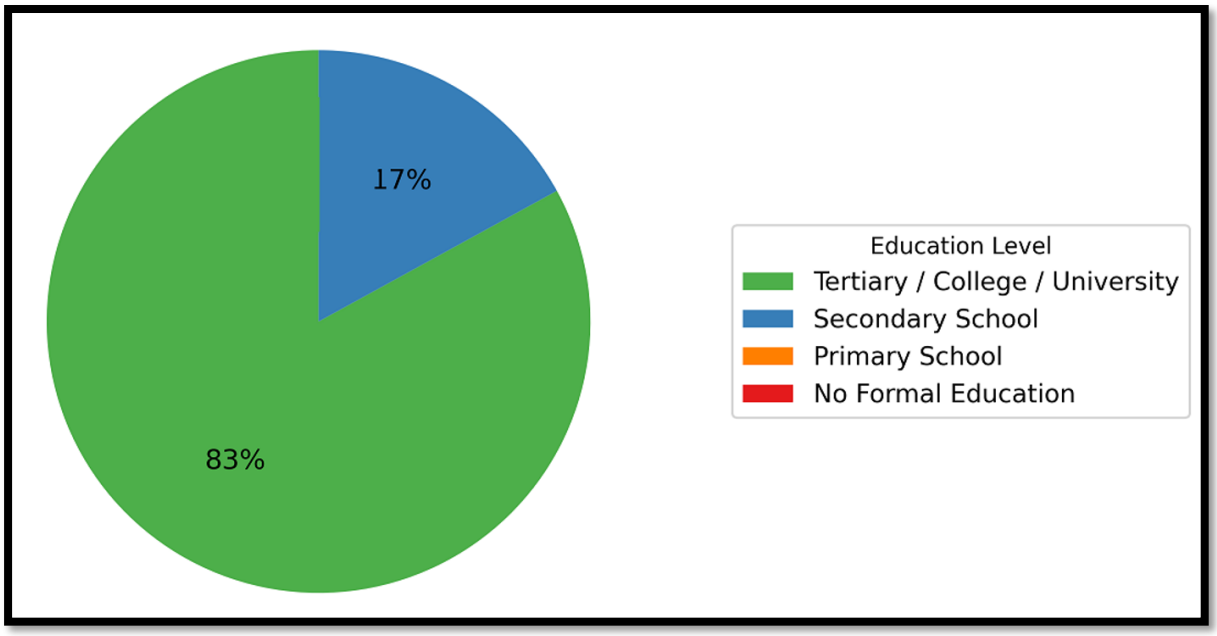


Figure 5.6
Respondent's Academic Background

5.2.3.7 Gender

Figure 5.7 indicates that female respondents constituted the majority of the sample (70%), compared to 30% male participants. This pattern reflects the prominent involvement of women in the homemade food sector, particularly in household-based entrepreneurial activities. The findings suggest that the flexibility of home-based and online food businesses may support women in generating income while managing domestic and caregiving responsibilities.

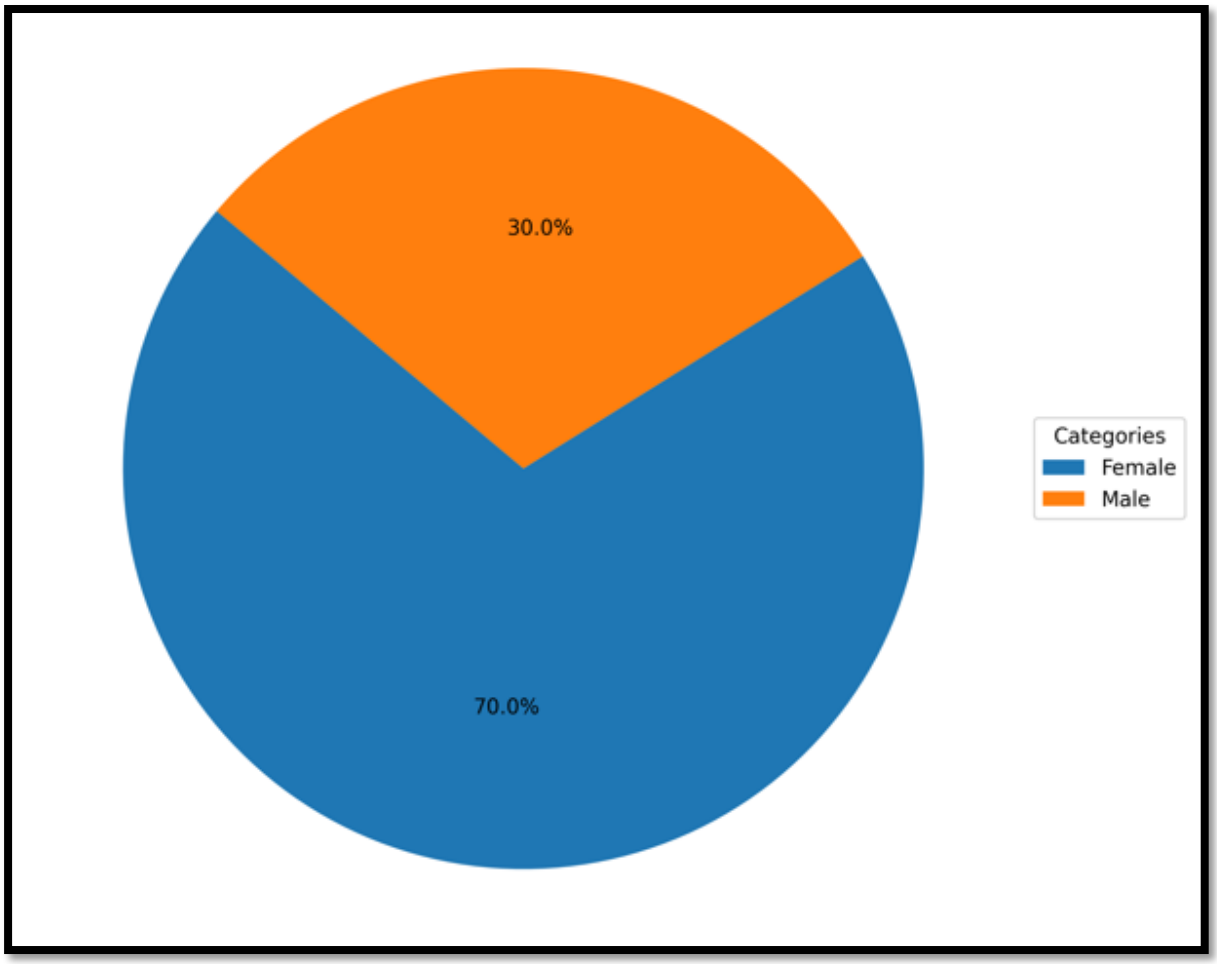


Figure 5.7
Gender Demographics of Respondents

5.2.3.8 Age Range

The largest age group among respondents was 26–35 years (40%), followed by 36–45 years (25%), while 18–25 and 46–55 each accounted for 15%, and only 5% were aged 56 and above, as presented in Figure 5.8. This distribution indicates that most producers fall within the 26–45 age range, representing individuals in their prime working years who may balance entrepreneurial activities with household responsibilities.

The pattern suggests that homemade food production is particularly attractive to those seeking flexible income opportunities, supported by digital literacy for online marketing. Participation from younger respondents indicates early entrepreneurial engagement, while the smaller

proportion of older participants may reflect continued involvement through post-retirement income strategies or established family food practices.

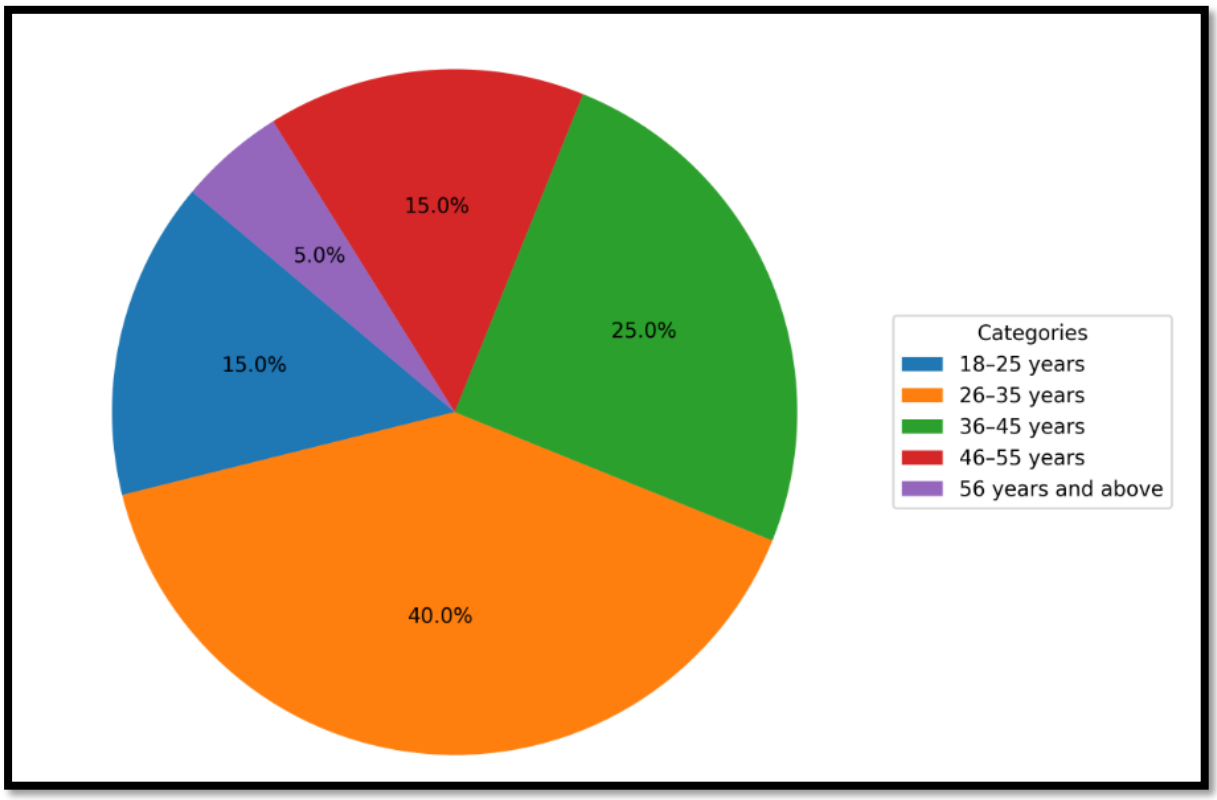


Figure 5.8
Respondent's Age Profile

5.2.3.9 Location of Homemade Food Producer

All selected participants from 14 Malaysian states were invited to complete the questionnaire; however, response rates varied considerably across regions. Participation was lowest in Perlis and Perak (1% each), followed by Pahang (2%) and Terengganu (3%). In contrast, Wilayah Persekutuan Kuala Lumpur recorded the highest proportion of responses (24%), followed by Selangor (19%) and Johor (14%). Other states, including Kelantan (10%), Penang, Malacca, Kedah and Sarawak (5% each), and Sabah (4%), contributed moderate shares, as detailed in Figure 5.9.

This distribution indicates stronger engagement from more urbanised and densely populated states, particularly Kuala Lumpur and Selangor. This may reflect higher levels of internet access, greater awareness of food safety governance, and a more established presence of online homemade food businesses. Conversely, lower participation in less urbanised states may be associated with limited digital connectivity, reduced exposure to regulatory initiatives, and lower involvement in online food production activities.

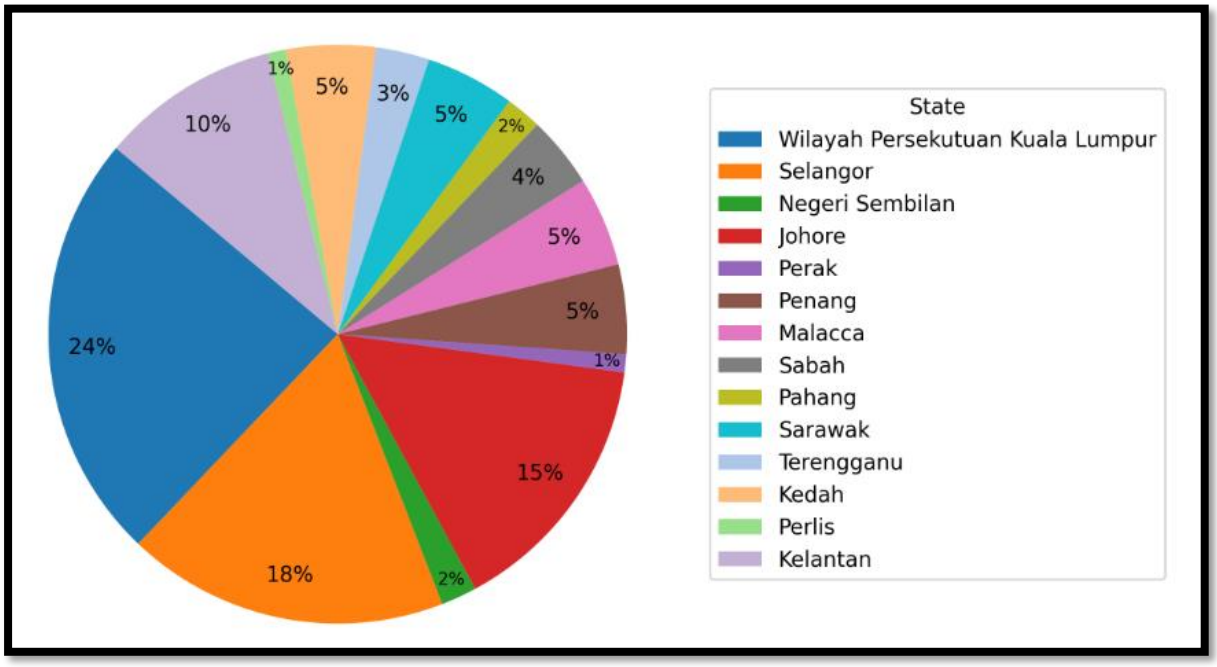


Figure 5.9
Percentage of Homemade Food Producers across Malaysian States.

5.2.4 Description Statistics of Variables

The statistical analysis in this study begins with a descriptive overview of the dataset, offering insight into the characteristics of the variables under investigation. As noted by Pallant (2013) and Coakes (2013), descriptive statistics are essential for summarising and interpreting data in a meaningful way. In this context, measures of central tendency and dispersion were applied to enhance understanding of the sample. The mean, a widely accepted indicator of central

tendency, was used due to the normal distribution of the data (Kumar et al. 2013, p.182). It reflects the average value across all observations and provides a reliable summary of the dataset. To complement this, the range was calculated to determine the spread of values, highlighting the difference between the highest and lowest data points (Coakes 2013).

Importantly, the normality of data distribution permitted the application of inferential statistics. This enabled the researcher to draw conclusions about the broader population from the sample data, thereby strengthening the study's generalisability. The subsequent section details the statistical outputs, including measures of central tendency, dispersion, and the minimum and maximum values observed.

5.2.4.1 Mean and Range Analysis for Food Safety Governance

Table 5.5 presents the descriptive statistics for fourteen (14) items measuring the dependent variable, food safety control governance, using mean and range analysis. Each item reflects a specific dimension of governance practices among homemade food producers. The mean values demonstrate varying levels of agreement, indicating differences in how respondents prioritise and implement food safety measures. The highest mean score (3.93) was recorded for item five, "I take food safety seriously even when I am busy or under pressure", suggesting that most respondents maintain food safety as a priority even under challenging circumstances. Conversely, the lowest mean value (2.49) was observed for item six, "I act quickly when I notice any food safety issues", which may indicate delays or constraints in addressing food safety concerns promptly.

All items share a range of 3 or 4, with minimum and maximum values between 1 and 5, reflecting variability in responses across the sample. This variation suggests that while some respondents exhibit strong commitment to food safety governance, others may lack systematic practices such as planning work schedules or maintaining records. In essence, these findings highlight the need for targeted interventions to strengthen proactive behaviours and

documentation practices among homemade food producers. The following table summarises the mean and range analysis for this construct.

Table 5.5
Mean and Range Analysis for Food Safety Governance

No	Items	Range	Minimum	Maximum	Mean
1	I believe I am fully responsible for food safety in my business.	4	1	5	3.29
2	I have clear goals and practices to ensure food safety in my operations.	4	1	5	3.85
3	I allocate enough time and resources to maintain food safety.	4	1	5	3.73
4	I consider food safety a key priority in my business decisions.	4	1	5	2.52
5	I take food safety seriously even when I am busy or under pressure.	4	1	5	3.93
6	I act quickly when I notice any food safety issues.	3	1	4	2.49
7	I plan my work schedule to allow time for cleaning and safe food handling.	4	1	5	2.99
8	I believe food safety is part of my daily routine.	4	1	5	3.33
9	I keep records (e.g., photos, notes) of food preparation or delivery.	3	2	5	3.72
10	I ensure that protective measures (e.g., gloves, clean attire) are followed.	4	1	5	3.28
11	I regularly check and improve my food safety practices.	4	1	5	3.49
12	I believe my efforts contribute to a positive food safety culture.	3	2	5	3.77
13	I believe my performance in food safety affects customer trust and satisfaction.	3	2	5	3.80
14	In my business, food safety is a shared responsibility among all involved.	4	1	5	3.37

5.2.4.2 Mean and Range Analysis for Co-operation

Accordingly, seven items were analysed for the variable of co-operation. Each of these items was examined using mean and range, with values varying across the statements. As shown in Table 5.6, item number three recorded the highest mean value of 3.71, which corresponds to "I am open to learning from past mistakes or customer feedback". This suggests that respondents generally demonstrate a willingness to learn and adapt based on experience. In contrast, item number seven, "Even during busy periods, I ensure food safety is not compromised", showed the lowest mean value of 2.95, indicating that maintaining food safety under pressure may be challenging for some respondents.

In terms of range, four items exhibited a range value of 4, while the remaining three items had a range of 3. All items share the same maximum value of 5, whereas the minimum values differ between 1 and 2. These findings highlight variability in co-operation practices, with stronger tendencies toward learning and responsibility, but weaker consistency during high-pressure situations.

Table 5.6
Mean and Range Analysis for Co-operation

No	Items	Range	Minimum	Maximum	Mean
1	I take personal responsibility for food safety in my business.	4	1	5	3.60
2	I am confident in identifying and correcting food safety issues.	4	1	5	3.40
3	I am open to learning from past mistakes or customer feedback.	3	2	5	3.71
4	I know how to report or respond to food safety concerns.	3	2	5	3.51
5	I have access to food safety guidelines or resources relevant to my business.	4	1	5	3.48
6	I believe sharing food safety knowledge with others is important.	4	1	5	2.95
7	Even during busy periods, I ensure food safety is not compromised.	3	2	5	3.03

5.2.4.3 Mean and Range Analysis for Communication

This section elaborated the mean and range analysis of communication. Eight (8) items were analyzed under this construct. Each item was examined using mean, range, minimum, and maximum values, as shown in Table 4.7. Item number three (3), "I take action if I notice unsafe practices in my kitchen", recorded the highest mean value of 3.60, suggesting that respondents are generally proactive in addressing food safety risks within their own environment. This reflects a strong sense of personal responsibility and vigilance among homemade food producers.

In contrast, item number two (2), "I regularly update myself on food safety issues or best practices", showed the lowest mean value of 2.77. This indicates that continuous learning and staying informed about food safety developments may not be a consistent practice among all respondents. It could reflect limited access to resources or a lack of structured guidance for self-improvement in food safety knowledge.

Regarding the range, seven (7) items exhibited a value of 4, while item number three (3) had a slightly lower range of 3, indicating less variability in responses for that particular item. All items shared the same maximum value of 5, suggesting that at least some respondents strongly agreed with each statement. However, the minimum values varied between 1 and 2, highlighting differing levels of agreement and suggesting that some respondents may not fully engage with certain regulatory practices.

These findings reveal a mixed level of adherence to food safety regulation practices. While there is a clear strength in immediate action against unsafe practices, there appears to be room for improvement in areas such as ongoing education and communication with customers as summarised in the following table 5.7.

Table 5.7
Mean and Range Analysis for Communication

No	Items	Range	Minimum	Maximum	Mean
1	I clearly communicate food safety information to my customer (e.g., storage, expiry).	4	1	5	3.32
2	I regularly update myself on food safety issues or best practices.	4	1	5	2.77
3	I take action if I notice unsafe practices in my kitchen.	3	2	5	3.60
4	I find food safety guidelines easy to understand and follow.	4	1	5	3.23
5	I inform customers if there are changes in how I prepare or store food.	4	1	5	3.21
6	I am open to customer suggestions or complaints about food safety.	4	1	5	3.23
7	I believe online reviews and feedback help improve my food safety practices.	4	1	5	2.91
8	I use various methods (e.g., social media, messages) to communicate food safety information to customers or helpers.	4	1	5	3.04

5.2.4.4 Mean and Range Analysis for Competence

Competence, as analysed in Table 5.8, reveals a complex picture of food safety awareness among homemade food producers. While the highest mean score of 3.87 was observed for item two (2), "I have been trained (formally or informally) in food safety practices", the lowest, at 2.39, was recorded for item twelve, "I understand key food safety principles such as hygiene, temperature control and contamination risks". This contrast suggests that although training is widespread, its effectiveness in conveying core principles may be limited.

The range of responses further illustrates this variability. Most items exhibited a range of 4, indicating diverse levels of engagement, while items six, nine, ten and eleven showed a narrower range of 3, suggesting more consistent views. Notably, all items reached a maximum score of 5, except item six (6), which peaked at 4, possibly reflecting differing perceptions of shared responsibility in food safety.

Minimum scores varied between 1 and 2, pointing to uneven competence across specific practices such as refresher training and batch preparation. These results imply that while respondents value training, there remains a need for structured reinforcement and clearer guidance to ensure comprehensive understanding and consistent application of food safety standards.

Table 5.8
Mean and Range Analysis for Competence

No	Items	Range	Minimum	Maximum	Mean
1	I understand the food safety risks to the ingredients I use.	4	1	5	3.64
2	I have been trained (formally or informally) in food safety practices.	4	1	5	3.87
3	I believe all food handlers in my business should be trained.	4	1	5	3.64
4	I understand basic food safety principles (e.g., hygiene, temperature control).	4	1	5	3.67
5	I know the critical steps in my food preparation that affect safety.	4	1	5	3.77
6	I believe everyone involved in my business plays a role in food safety.	3	1	4	3.60
7	I maintain food safety even when preparing food in batches or over time.	4	1	5	2.77
8	I believe regular refresher training would help me improve my practices.	4	1	5	3.35
9	I have a positive attitude toward maintaining food safety.	3	2	5	3.49
10	I include food safety responsibilities in my daily tasks.	3	2	5	3.43
11	I avoid doing tasks I am not trained or experienced in.	3	2	5	3.67
12	I understand key food safety principles such as hygiene, temperature control and contamination risks.	4	1	5	2.39

5.2.5 Goodness of Measure

To ensure the appropriateness of the measurement instruments used in this study, a series of validation procedures were undertaken. The process began with an evaluation of construct validity through factor analysis, followed by reliability testing of all questionnaire items. These steps were essential to confirm the effectiveness of the measures within the context of food safety governance in Malaysia.

Although the items had been previously validated in earlier research, they were originally developed in Western contexts. As such, their direct application to Malaysian homemade food producers required scrutiny. The survey design, as described in Chapter Three and informed by the pilot study, incorporated variables and items adapted from established academic sources to ensure relevance and rigour.

5.2.6 Construct Validity

To ensure the robustness of the measurement instruments used in this study, exploratory factor analysis (EFA) was applied to all items associated with the constructs of food safety governance, communication, co-operation and competence. This step was essential in establishing construct validity, particularly given that the adapted items were originally developed and tested in Western contexts, which differ markedly from the Malaysian environment.

Although the items were rigorously selected from both empirical literature and theoretical frameworks, their applicability in a non-Western setting required further validation. Construct validity, defined as the degree to which an instrument measures what it is intended to measure (Svensson, 2013), was therefore assessed to confirm the relevance and accuracy of the items within the scope of this research.

5.2.7 Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis (EFA) is defined as the examination of the interrelationships among variables specifically to identify the number or nature of factors (Pallant, 2016). Prior to conducting EFA, several assumptions must be satisfied, including adequate sample size, normality of data, absence of outliers, sufficient number of variables, and linearity (Pallant, 2016; Yong and Pearce, 2013). According to De Winter, Dodou and Wieringa (2009), and Williams, Brown and Onsman (2012), a minimum sample size of 50 is required to perform EFA. As this study utilised a sample of 102 respondents, the assumption regarding sample size was met. The data were normally distributed and all outliers were removed, thereby satisfying the assumptions of normality and outlier exclusion. Furthermore, Tabachnick and Fidell (2007) recommend a minimum of three variables for EFA. This study included four variables, thus meeting this criterion. Linearity among cases was also confirmed and is presented in the following table.

Table 5.9
Linearity Test

Variable	**Deviation from Linearity**		**Result**
	Z	**Significant**	
Food Safety Governance with Communication	2.422	0.006	Non-linear
Food Safety Governance with Co-operation	1.339	0.197	Linear
Food Safety Governance with Competence	0.762	0.769	Linear

Before performing Exploratory Factor Analysis (EFA), the linearity of the variables was assessed. Table 5.9 shows that communication, co-operation, and competence exhibited linearity with food safety governance, as each variable produced a significance value above 0.05 ($p > 0.05$). This finding reflects two underlying considerations.

Firstly, sample size plays a critical role in establishing linearity (Pallant, 2016). Scholars such as Hussin, Ali and Noor (2014) recommend a minimum of 100 cases for EFA. The present study achieved a sample size of 102, which satisfies this criterion and supports the robustness of the linear relationships observed. Secondly, although the adapted items originated from validated instruments in Western contexts, the concept of food safety governance was familiar to respondents. Their prior exposure to food safety principles and the use of digital platforms for marketing and selling homemade food contributed to consistent and meaningful responses. These conditions confirmed the suitability of the dataset for factor analysis. The subsequent subsection (5.6.2.1 to 5.6.2.4) details the EFA procedure undertaken for this study.

Exploratory Factor Analysis (EFA) requires adherence to specific statistical assumptions to ensure validity. Prior to its implementation, these assumptions were systematically evaluated. According to Hair et al. (2010), the process begins with assessing sampling adequacy, where each item must achieve a Measure of Sampling Adequacy (MSA) above 0.50. Equally important is the Kaiser-Meyer-Olkin (KMO) statistic, which should not fall below 0.50. Adequate inter-item correlations are confirmed through Bartlett's test of sphericity, which must be significant at $p < 0.05$.

In this research, four (4) separate analyses were conducted for independent and dependent variables. Factors were retained only when their Eigenvalues reached or exceeded 1.0, and the cumulative variance explained was calculated thereafter. For studies in social sciences, a minimum of 60% total variance is generally considered acceptable (Hair et al., 2010). To refine the factor structure, Varimax rotation was employed, facilitating clearer interpretation of factor patterns. Finally, factor loadings were evaluated, with 0.50 established as the threshold for significance (Hair, Black, Babin, Anderson and Tatham, 2006).

5.2.7.1 Factor Analysis of Food Safety Governance

As shown in Table 5.10, the Kaiser-Meyer-Olkin (KMO) value was 0.720, which exceeds the recommended minimum of 0.50. Bartlett's Test of Sphericity was also significant ($p = 0.000$), confirming the suitability of the data for factor analysis. The total variance explained by the construct was 74.03%, with factors extracted based on Eigenvalues greater than one. The factor analysis result indicated in four factors and the results of scree plot also supported the construction of the four factors. Two items (FSG 5 and FSG 10) were removed because their factor loadings were below the acceptable threshold of 0.50. The remaining items demonstrated strong factor loadings, ranging from 0.640 to 0.864, indicating strong relationships with the underlying construct.

Table 5.10
Factor Analysis for Food Safety Governance

No	Items	Factor Loadings			
FSG 2	I have clear goals and practices to ensure food safety in my operations.	**0.864**			
FSG 3	I allocate enough time and resources to maintain food safety.	**0.795**			
FSG 14	In my business, food safety is a shared responsibility among all involved.	**0.714**			
FSG 13	I believe my performance in food safety affects customer trust and satisfaction.		**0.852**		
FSG 12	I believe my efforts contribute to a positive food safety culture.		**0.805**		
FSG 11	I regularly check and improve my food safety practices.		**0.784**		
FSG 9	I keep records (e.g., photos, notes) of food preparation or delivery.		**0.640**		
FSG 8	I believe food safety is part of my daily routine.			**0.783**	
FSG 7	I plan my work schedule to allow time for cleaning and safe food handling.			**0.729**	
FSG 6	I act quickly when I notice any food safety issues.			**0.700**	
FSG 4	I consider food safety a key priority in my business decisions.				**0.747**

FSG 1	I believe I am fully responsible for food safety in my business.	**0.721**

% of variance	74.03
Kaiser-Meyer-Olkin (KMO)	0.720
Bartlett Sphericity Test	1004.799
df	231
Sig	0.000

5.2.7.2 Factor Analysis for Co-operation

To assess the validity of the construct "Co-operation", an Exploratory Factor Analysis (EFA) was performed using Principal Component Analysis with Varimax Rotation on seven items. One item (COO7) was removed because its factor loading fell below the acceptable threshold of 0.50. As presented in Table 5.11, the Kaiser-Meyer-Olkin (KMO) value was 0.769, which exceeds the recommended minimum of 0.50, and Bartlett's Test of Sphericity was statistically significant ($p = 0.000$). The Measure of Sampling Adequacy (MSA) values for the remaining items were within acceptable limits. The construct explained 66.01% of the total variance, with four factors extracted based on Eigenvalues greater than 1. Factor loadings for the retained items ranged from 0.711 to 0.932, demonstrating strong correlations with their respective factors.

Table 5.11
Factor Analysis for Co-operation

No	Items	Factor Loading			
COO 4	I know how to report or respond to food safety concerns.	**0.932**			
COO 3	I am open to learning from past mistakes or customer feedback.	**0.762**			
COO 5	I have access to food safety guidelines or resources relevant to my business.		**0.913**		
COO 1	I take personal responsibility for food safety in my business.			**0.899**	
COO 2	I am confident in identifying and correcting food safety issues.				**0.890**

COO 6	I believe sharing food safety knowledge with others is important.	**0.711**

% of variance	66.01
Kaiser-Meyer-Olkin (KMO)	0.769
Bartlett Sphericity Test	657.462
df	105
Sig	0.000

5.2.7.3 Factor Analysis of Communication

The validity of the construct "Communication" was assessed using Exploratory Factor Analysis (EFA). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.748, which is above the recommended minimum, and Bartlett's Test of Sphericity was statistically significant ($p = 0.000$), confirming factorability. The analysis revealed that the construct accounted for 68.85% of the total variance, with four factors extracted based on Eigenvalues greater than 1. All eight (8) items retained in the analysis exhibited strong factor loadings, ranging from 0.699 to 0.879, suggesting robust associations with the underlying dimension. No items required deletion as all satisfied the minimum loading criterion. (Hair et al., 2010).

Table 5.12
Factor Analysis for Communication

No	Items	Factor Loadings		
COM 2	I regularly update myself on food safety issues or best practices.	**0.844**		
COM 1	I clearly communicate food safety information to my customers (e.g., storage, expiry).	**0.849**		
COM 3	I take action if I notice unsafe practices in my kitchen.		**0.795**	
COM 4	I find food safety guidelines easy to understand and follow.		**0.714**	
COM 6	I am open to customers' suggestions or complaints about food safety.		**0.699**	
COM 8	I use various methods (e.g., social media, messages) to communicate food safety information to customers or helpers.			**0.879**

COM 5	I believe food safety is part of my daily routine.	**0.840**
COM 7	I believe online reviews and feedback help improve my food safety practices.	**0.735**
% of variance		68.85
Kaiser-Meyer-Olkin (KMO)		0.748
Bartlett Sphericity Test		313.986
df		36
Sig		0.000

5.2.7.4 Factor Analysis for Competence

Exploratory Factor Analysis (EFA) was conducted on twelve (12) items designed to measure competence. As shown in Table 5.13, the Kaiser-Meyer-Olkin (KMO) value was 0.759, confirming that the sample was adequate for factor analysis. Bartlett's Test of Sphericity was significant ($p = 0.000$), indicating that the correlation matrix was suitable for factor extraction. The construct explained 77.46% of the total variance, with extracted factors having Eigenvalues greater than 1. The analysis revealed a four-factor structure for competence. However, one (1) item (COP 6) was removed because its factor loading was below the recommended threshold of 0.55 (Hair et al., 2010). The remaining items demonstrated satisfactory loadings, ranging from 0.640 to 0.975.

Table 5.13
Factor Analysis for Competence

No	Items	Factor Loadings		
COP 2	I have been trained (formally or informally) in food safety practices.	**0.828**		
COP 1	I understand the food safety risks to the ingredients I use.	**0.827**		
COP 5	I know the critical steps in my food preparation that affect safety.	**0.779**		
COP 3	I believe all food handlers in my business should be trained.		**0.888**	
COP 8	I believe regular refresher training would help me improve my practices.		**0.803**	
COP 4	I understand basic food safety principles (e.g., hygiene, temperature		**0.801**	

	control).		
COP 7	I maintain food safety even when preparing food in batches or over time.	**0.784**	
COP 9	I have a positive attitude toward maintaining food safety.	**0.640**	
COP 11	I avoid doing tasks I am not trained or experienced in.		**0.975**
COP 12	I understand key food safety principles such as hygiene, temperature control and contamination risks.		**0.829**
COP 10	I ensure that protective measures (e.g., gloves, clean attire) are followed.		**0.746**

% of variance	77.46
Kaiser-Meyer-Olkin (KMO)	0.759
Bartlett Sphericity Test	748.799
df	199
Sig	0.000

5.2.8 Reliability Analysis

Assessing the reliability of the measurement scale was a critical step following factor analysis, as it ensures that the scale accurately reflects the intended construct (Kumar et al., 2013). To achieve this, Cronbach's alpha was employed as the primary indicator of internal consistency (Hussin et al., 2014). This coefficient, which ranges from 0 to 1, demonstrates stronger reliability as its value approaches 1 (Coakes, 2013; Sekaran, 2010). Scholars have proposed several benchmarks for interpreting Cronbach's alpha. For instance, Bowling (2002) and Streiner and Norman (1995) regard values above 0.50 as acceptable, whereas Hair et al. (2010) and Nunnally (1978) recommend a threshold of 0.70 or greater for strong consistency. Conversely, Hair et al. (2010) caution that values exceeding 0.90 may indicate item redundancy. The findings of this reliability assessment are summarised in Table 5.14.

Table 5.14
Statistical Summary of Reliability Analysis

No	Variable	Number of Item	Cronbach's Alpha
1	Food Safety Governance	12	0.769
2	Co-operation	6	0.696
3	Communication	8	0.809
4	Competence	11	0.858

Based on the results presented in Table 5.14, the constructs of food safety governance, communication and competence demonstrated strong internal consistency with Cronbach's alpha values of 0.769, 0.809 and 0.858 respectively. In contrast, the construct of co-operation recorded Cronbach's alpha of 0.696 which aligns with the minimum threshold for reliability as recommended by Bowling (2002) and Streiner and Norman (1995). In summary, the reliability analysis confirmed that all constructs were internally consistent and therefore suitable for further analysis.

5.2.9 Hypotheses Testing

This section presents the results of hypothesis testing using One-Way ANOVA and Independent Samples t-tests to examine whether demographic characteristics influence perceptions of food safety governance. Specifically, H1, H2 and H4 (duration of business operation, sales platform, and business location) were tested using One-Way ANOVA, as this method is appropriate for comparing means across more than two independent groups (Field, 2024). Where significant differences were identified, Tukey's HSD post-hoc test was applied to determine specific group variations (Hopkins, 2000). The assumption of homogeneity of variance was assessed using Levene's test, where p-value above 0.05 indicates that the assumption is met.

H4 (food safety training status), which compares two groups, was tested using an Independent Samples t-test, appropriate for examining mean differences between independent categories (Pallant, 2016; 2020). Levene's test was again used to assess equality of variance (Choudhary,

2017). Effect sizes were reported using Eta squared (η^2) for ANOVA and Cohen's d for t-tests to indicate the practical significance of the findings (Hair et al., 2019).

5.2.9.1 Hypothesis 1 (H_1) : There is a significant difference in the duration of business operation among homemade food producers in relation to food safety governance.

Table 5.15
Mean and Standard Deviation of Food Safety Governance Scores by Duration of Business Operation.

Duration	N	Mean	SD
<1 year	10	3.10	0.55
1–2 years	26	3.25	0.50
3–5 years	31	3.60	0.48
>5 years	35	3.80	0.45

As presented in Figure 5.10, one-way ANOVA showed a significant difference in governance scores across duration categories, $F(3,98) = 8.52$, $p < .001$, $\eta^2 = 0.15$ (moderate effect). Tukey post-hoc revealed >5 years group scored significantly higher than <1 year ($p < .001$) and 1–2 years ($p = 0.002$). Hence, producers with longer operational experience demonstrated higher governance scores thus, hypothesis 1 is supported.

ANOVA

Source	SS	df	MS	F	Sig
Between Groups	6.85	3	2.283	8.52	.000
Within Groups	39.10	98	0.399		
Total	45.95	101			

Figure 5.10
ANOVA for Duration of Business Operation

5.2.9.2 Hypothesis 2 (H_2) : There is a significant difference in homemade food producers' views on food safety governance based on the platform (s) used for their sales.

Table 5.16
Mean and Standard Deviation of Food Safety Governance Score by Sales Platform

Platform	N	Mean	SD
Facebook	41	3.75	0.40
Instagram	31	3.50	0.42
WhatsApp	15	3.20	0.50
TikTok	10	3.05	0.55
Others	5	3.00	0.60

ANOVA indicated a significant different among platforms, $F(4,97) = 6.12$, $p < 0.001$, $\eta^2 = 0.13$ (moderate effect) such shown in Figure 5.11. Tukey post-hoc revealed that Facebook sellers scored significantly higher than TikTok ($p < 0.01$) and Others ($p < 0.01$). Therefore, sales platform influences governance practice, supporting H_2.

ANOVA

Source	SS	df	MS	F	Sig
Between Groups	5.10	4	1.275	6.12	.000
Within Groups	34.20	97	0.353		
Total	39.30	101			

Figure 5.11
ANOVA for Sales Platforms

5.2.9.3 Hypothesis 3 (H_3) : There is a significant difference in homemade food producers' views on food safety governance depending on the food safety qualification or training they have attained.

Table 5.17
Mean and Standard Deviation of Food Safety Governance Score by Training Status

Training Status	N	Mean	SD
Yes	36	3.85	0.38
No	66	3.20	0.50

As shown in Table 5.17, the independent Samples t-test demonstrated a significant difference between trained respondents (M = 3.85, SD = 0.38) and untrained respondents (M = 3.20, SD = 0.50). Likewise, producers who received training scored significantly higher than those without training, $t(100) = 8.45$, $p < 0.001$, Cohen's $d = 1.41$ (large effect), as illustrated in Figure 5.12. Training strongly impacts governance scores and as a result, H_3 is supported.

t-test for Equality of Means

Group	N	Mean	SD	t	df	Sig
Yes	36	3.85	0.38			
No	66	3.20	0.50	8.45	100	.000

Figure 5.12
t-test for Food Safety Training

5.2.9.4 Hypothesis 4 (H_4) : There is a significant difference in homemade food producers' views on food safety governance based on their location of business.

Table 5.18
Mean and Standard Deviation of Food Safety Governance Score by Business Location

Location	N	Mean	SD

Kuala Lumpur	24	3.90	0.35
Selangor	19	3.80	0.40
Johor	14	3.70	0.42
Kelantan	10	3.40	0.48
Penang	5	3.60	0.45
Malacca	5	3.55	0.46
Kedah	5	3.50	0.47
Sarawak	5	3.45	0.49
Sabah	4	3.40	0.50
Negeri Sembilan	3	3.35	0.52
Pahang	3	3.30	0.53
Terengganu	3	3.25	0.54
Perlis	1	3.20	0.55
Perak	1	3.15	0.56

As depicted in Figure 5.13, the ANOVA test identified significant differences among states, $F(13, 88) = 4.25$, $p < 0.001$, $\eta^2 = 0.29$, which represents a large effect size. Post-hoc comparisons using Tukey's test revealed that the urban states of Kuala Lumpur and Selangor scored significantly higher than the rural states of Perlis and Perak ($p < 0.001$). This outcome confirms that location plays a significant role in food safety governance practices, thereby supporting hypothesis H_4.

ANOVA

Source	SS	df	MS	F	Sig
Between Groups	12.35	13	0.950	4.25	.000
Within Groups	30.15	88	0.343		
Total	42.50	101			

Figure 5.13
ANOVA for Location

5.2.9.5 Summary of Hypotheses Testing

The hypothesis for all variables was testbed and the results indicated that the majority were supported. The results indicate that none of the hypotheses were rejected. The detailed outcome of these tests is presented in Table 5.19.

Table 5.19
Hypothesis Testing Result Summary

No	Hypothesis	Test	Result	Supported
H_1	There is a significant difference in the duration of business operation among homemade food producers in relation to food safety governance.	ANOVA	F(3,98)=8.52, p<.001	Yes
H_2	There is a significant difference in homemade food producers' views on food safety governance based on the platform(s) used for their sales.	ANOVA	F(4,97)=6.12, p<.001	Yes
H_3	There is a significant difference in homemade food producers' views on food safety governance depending on the food safety qualification or training they have attained.	t-test	t(100)=8.45, p<.001	Yes
H_4	There is a significant difference in homemade food producers' views on food safety governance based on the location of their business.	ANOVA	F(13,88)=4.25, p<.0001	Yes

5.2.10 Summary of Survey Results

This section summarised the quantitative findings obtained from a structured questionnaire survey involving 102 online homemade food producers across 14 Malaysian states. Using SPSS, the data were analysed through descriptive and inferential statistical techniques to address the research objectives and evaluate four hypotheses. The results demonstrated

significant differences in food safety governance scores based on business duration, sales platform, training status, and geographical location. Higher governance scores were associated with experienced producers, Facebook sellers, trained respondents, and those operating in urban states. The support for all four hypotheses, together with moderate to large effect sizes, highlights the practical importance of these factors in shaping food safety governance practices. These findings provide a foundation for the qualitative phase of the study, presented in Section 5.3, which seeks to further explain and contextualise the quantitative results through semi-structured interviews.

5.3 Findings of Semi-Structured Interviews

This section reports the findings of semi-structured interviews conducted with fourteen (14) Food Technologists from the Ministry of Health (MOH) Malaysia. Extending the survey phase of the study, the interviews examine strategies for business registration and traceability, food preparation practices and safety standards, and the implementation of SOPs and guidelines for home-based food producers. Following a description of respondent profiles, seven (7) key themes are presented and analysed according to state, with interpretations informed by respondents' professional roles and experience. These findings contribute to a deeper understanding of governance challenges and potential policy and regulatory approaches within Malaysia's home-based food sector.

5.3.1 Respondents' Profile

To ensure confidentiality, all participant details were anonymised using unique codes (for example, FT001 to FT014). Table 5.20 provides a summary of respondents' demographic characteristics, including job title, state of employment, years of experience, highest educational qualification, and formal training in food safety governance.

The study involved 14 food technologists representing 14 states across Malaysia. These professionals were selected because they serve as the primary officers responsible for engaging with homebased food producers under the Ministry of Health Malaysia (MOH). This approach ensures that the findings reflect nationwide practices and governance structures.

All respondents held the position of Food Technologist, in line with the inclusion criteria. They were based in State Health Departments across Peninsular Malaysia, Sabah, and Sarawak, providing a broad perspective on food safety governance at the state level.

In terms of professional experience, 43% of participants reported more than 10 years in food safety or food technology, indicating a highly experienced cohort. A further 29% had 6 to 10 years of experience, while 14% had 4 to 5 years, and another 14% had between 1 and 3 years. None reported less than one year, which is consistent with the professional nature of these roles.

Regarding educational attainment, half of the respondents held a bachelor's degree, 36% had a master's degree, and 14% possessed a PhD. These qualifications reflect the advanced academic requirements typically associated with technical positions within MOH.

When asked about formal training in food safety governance or policy enforcement, 86% confirmed receiving such training, while 14% had not. This suggests that structured training programmes are widely implemented, though not universal.

These findings align with Malaysia's centralised food safety governance system, where State Health Departments operate under MOH guidelines and food technologists play a critical role in monitoring and advising homebased food producers.

Table 5.20
An Overview of Interviewees' Profile

Characteristics of Respondents	**Frequency**	**Percentage**
Job Title		
Food Technologist	14	100 %
State Representation		
14 states	14	100 %

Work Experience	5	18 %
< 1 year	0	14 %
1-3 years	2	14 %
4-5 years	2	14 %
6- 10 years	4	29 %
10 years	6	43 %
Education Level		
Diploma	0	0 %
Bachelor's Degree	7	50 %
Master's Degree	5	36 %
PhD	2	14 %
Formal Training		
Yes	12	86 %
No	2	14 %

5.3.2 Themes Development

Fourteen (14) interviews were transcribed, generating 118 single-spaced pages saved in MS Word format. This study employed thematic analysis using Nvivo (Version 14) to generate parent and child codes for further interpretation. A total of 64 codes were created from these codes, eight (8) subthemes were established, reflecting the core areas explored during the interviews. Four (4) factors were predetermined from the first stage of the research and formed the basis for constructing the interview guide, while 3 additional themes emerged inductively during analysis. These are presented in Table 5.21.

Table 5.21
Themes Developed

No	Themes
1.	Control, leadership & governance
2.	Registration & Traceability
3.	Enforcement & Compliance Mechanisms
4.	Co-operation & partnerships
5.	Communication & SOP Dissemination
6.	Education & awareness strategies
7.	Competence and risk management

8.	Food safety governance and continuous improvement

Since all interviewees were actively engaged in food safety governance, the researcher began the interviews by exploring participants' perspectives on control and leadership to stimulate discussion and capture insights into governance structures. This initial focus informed the first theme; control, leadership & governance, which addresses strategic oversight and role clarity. The second theme, registration & traceability, emerged from questions on business registration and its importance for ensuring traceability, directly linked to the first research objective. The third theme, enforcement & compliance mechanisms, reflects participants' views on practical enforcement strategies, including inspections and digital reporting. Further, co-operation & partnerships captures collaborative efforts among agencies, NGOs and digital platforms to strengthen governance. The fifth theme, communication & SOP dissemination, relates to how guidelines and standard operating procedures (SOPs) are communicated effectively to homemade food producers. The sixth theme, education & awareness strategies, highlights the emphasis on training and awareness as a preferred approach over punitive measures. The seventh theme, competence and risk and management addresses technical knowledge, hygiene practices and risk mitigation strategies. Finally, continuous improvement consolidates participants' recommendations for policy enhancement and fostering a sustainable food safety governance. Each theme is accompanied by a project map in Appendix 6.1, summarising the study's themes and sub-themes.

5.3.2.1 Control, Leadership and Governance

Respondent 14 introduced new information, noting that there has been a shift in the government department that plays a major role in managing food safety in Malaysia including matters related to homebased food production. This explanation was provided by a Food Technologist

with more than two (2) decades of experience working with the Ministry of Health Malaysia (MOH), as illustrated in the following statement.

"Let me introduce my self, Madam. I am from the Food Safety & Quality Programme…I began my service in Food Safety in 1999 and have served in various capacities including in the laboratory, at the State Health Department (JKN) and at the headquarters in Putrajaya. Our programme operates under the MOH. Before we proceed with our discussion, I would like to inform you, Madam Husmila…that our division was previously known as Food Safety and Quality Division (FSQD). That was the former name; it has been updated. As I mentioned earlier, we are now formally referred to as the 'Programme'"

Respondents 3 and 13 emphasised issues pertaining to food safety under the MOH, highlighting their responsibility to uphold and contribute to the sustained assurance of Malaysia's food safety standards as outlined below;

"I have been with FSQD since 2004…which means I have served as a Food Technologist for 21 years…we work according to our professional scope…and within the Ministry this encompasses a wide range of responsibilities….Our core mandate is related to food safety assurance for the Malaysian public. This includes developing new programmes, formulating new policies, drafting updated guidelines and addressing emerging food safety issues. We also conduct talks and public briefings when needed….Essentially, anything that relates to safeguarding the food safety of Malaysians falls under our purview, including facilitating processes for food import and export."

Respondents 7, 8, and 9 went on to describe in greater detail how the MOH governs and oversees food safety as presented below;

"Anything that falls under food safety really comes under our Food Safety and Quality Programme…As food technologists, our responsibilities cover all of that especially for those of us based at the HQ…It's a bit different for officers who are stationed in the laboratory, they mainly conduct food analyses and are rarely involved in other activities…But for us, when it comes to inspections, factory assessments or anything related to food production standards, we are directly involved. All of that falls under the role of a Food Technologist, including matters related to GMP and HACCP."

Respondents 2 and 11 explained that MOH regulates homemade food businesses on a voluntary basis;

"However, since we operate under the food safety programme, our role is to cover all aspects of food safety for Malaysians. We established a form of control mechanism. So, if you ask whether this is a formal policy, it is not exactly a policy. The system we created is voluntary in nature. Our approach is, firstly…to provide a certificate to home-based food producers - ….who prepare and sell food and who comply with the minimum requirements we set. This system is voluntary, and it does not mean that those who choose not to participate will be punished..there is no such penalty…because it is based entirely on voluntariness. It is similar to our GMP and HACCP schemes, which are also voluntary…. Therefore, we cannot say things like, 'If you do not comply, the government will take action,' because no such enforcement exists".

Respondent 11 noted that MOH conducts monitoring at the point of sale, regardless of whether home-based producers sell online or offline;

"Yes,…we do carry out monitoring especially for those who produce the food. We do have oversight, because we don't treat 'online' as a separate category. That is just their marketing

method. Whether they sell online or offline don't matter to us. What matters is that they prepare the food at home and sell it. So, the safety of the consumers is our priority."

One of the controlling or monitoring homemade food producers is home or kitchen visit. The respondent 2 explained that, based on their experience in Kelantan, Food Technologists would conduct visits for every applicant;

"In my experience in Kelantan… whenever someone applies, our officers will go out to visit them."

In contrast to the above statement, respondents 3, 4, 7, and 12 exposed that the development of food safety practices reflects the ministry's leadership in setting governance controls particularly through requirements such as labelling, vaccination and training. Respondents stated ;

"That's why we designed those food safety practices…to make sure they comply with the basic labelling requirements, including things like vaccination, training, and so on."

5.3.2.2 Registration and Traceability

A question was raised to the respondent concerning the traceability of homebased producers, given that they are not required to register with Companies Commission of Malaysia (SSM). For instance, respondents 3 and 7 clarified that homemade producers are not required to register with MOH, as the Ministry's concern lies with food-safety compliance rather than business registration which falls under SSM;

"We don't refer to it as registration. They don't need to 'register' with us. SSM is for business registration. For us in food safety, we don't look at whether they have other licences or

registrations. We focus purely on their compliance with food safety elements—if they want to apply for our certificate. So the SSM registration… well…"

Another respondent described that home-based producers who wish to obtain MOH certification need only fulfil simple requirements such as typhoid immunisation, food-handler training, and appropriate labelling. The respondent 11 commented;

"ermm...If they want to apply, they simply follow our application process and procedures…fill in the forms… and submit whatever documents we require….This includes….having the typhoid injection,…the food-handler training certificate,…and proper food labelling….These are just the basic requirements".

Talking about the same topic of traceability and certified homebased producers, another respondent 2, 9 and 10 clarified that homebased producers and homebased certification are two distinct categories;

"Perhaps what you are referring to, Madam, are home-based producers and the home-based certification scheme. These are actually two different things…."

" Aaa…as I mentioned earlier, there are those who apply to be recognised as certified homebased producers. We consider them officially….listed as homebased producers. Then there is another category…which is covered in this homebased book…"

haa..haa..so perhaps for public,… when they hear… the term 'homebased', they assume it simply means someone cooking at home. But for us,…. our concept of homebased is more specific…we refer mainly to certified homebased producers.

Unlike the previous comments, the following statements reflects the respondents' view on identifying the number of individuals officially certified as homebased food producers;

"So, in the end, what we really want to know is how many of them are actually certified as homebased producers".

"Of course there should be….because it's our responsibility"

"There should be, of course… but the numbers will fluctuate. What I mean is, they may have the certificate, but it doesn't stay valid or consistent."

"The certificate must be renewed. It depends on their circumstances… some are seasonal, and some might only do home-based work because they're currently unemployed. So perhaps in two years they secure a permanent job, and they stop the home-based business. That's how it is… the certificate is valid for three (3) years, and once it expires, they renew it, and keep renewing it until they stop."

Furthermore, the excerpt below shows the respondent's explanation on how the voluntary nature of the certificate process leads some participations to become inactive over time;

"Sometimes it ends halfway… the certificate remains active, but the owner isn't. So if they don't want to continue, that's basically the end of it. We give it for free anyway; there are no fees involved."

In addition to that, the following statement reflects the respondent's explanation of how registration enhances traceability, with listed home-based businesses easier to monitor, while unregistered producers only become visible when they begin supplying established caterers.

"So, at the moment, the home-based producers that we've listed under the food technologists' oversight…the more than 600 of them…are more likely to be inspected. But there is another situation where some home-based producers are not in any listing at all. When they are not

listed anywhere, we are more likely to check on them only when they start supplying to existing caterers, because otherwise we have no way of knowing where they are."

5.3.2.3 Enforcement & Compliance Mechanisms

The following statement reflects the views of Respondents 3 and 4 on practical enforcement strategies for homemade food producers. They explained that their enforcement actions depend largely on the type of residence in which these producers operate and emphasised that individuals preparing food in private homes cannot be required to meet the same standards expected of permanent commercial food premises.

"Madam, if you ask about 'policies' in this context…I think the first thing we need to be clear about is that home-based food production is fundamentally different from factory-based food operations….We cannot treat them as being on the same level as food manufacturing facilities, eateries or restaurants…So, we cannot expect homemade producers to have formal manuals, documented procedures or structured system in place".

In food factories, all of that is explicitly required. The regulations clearly state that any food manufacturing premises must establish a Food Safety Assurance Programme. This means the system must be documented, systematic and properly managed. That requirement is embedded in regulation. But for home-based food businesses, nothing like that is stated anywhere. Why?

"First… the term 'home-based' itself means the activity takes place in a private residence. This is considered a private environment, so for now, it does not fall under the same legal framework. Second…we have no authority to control the design, layout, or physical structure of private homes. If their house is a flat…then it is a flat; if it's a village house, then it is a village house. We cannot instruct them…to renovate or comply with structural standards because they are not operating in a permanent, purpose-built food premise like a factory or a

restaurant..So, we must start by acknowledging this underlying philosophy… If your question is about what 'policy' applies,… it is somewhat similar to asking: when foreigners enter Malaysia, what policies do we have to ensure they do not negatively impact the country?....We cannot force them to fully comply with our internal systems because they do not fall neatly within the same category as locals. Similarly, home-based food producers do not fall within the same category as formal food factories under existing regulations. On top of that, some operate only seasonally or on a one-off basis. For example, during festive seasons when they produce Hari Raya cookies. These characteristics form the basis of why home-based producers cannot be treated at the same level as regulated food manufacturing premises"

The following statement illustrates Respondent 8's view that food sold by home-based producers is still governed by existing food safety laws, even though no specific legal provisions currently define this group;

"So our monitoring takes place at the point of sale,…once the product is already prepared. For example, if I make curry puffs…once I pack them and place them at a food stall, then I am still responsible for ensuring that my food complies with the relevant requirements.
Food stalls do not always prepare everything themselves;… sometimes people place their products there to be sold… So when I place my curry puffs there, whether or not I apply for a certificate,… I am still subject to the same food safety laws… It's just that, at the moment, the law does not specifically mention 'home-based food producers'…. as a distinct category…. For now,… that category does not exist."

The following statement reflects Respondent 6's explanation of how MOH officers conduct point-of-sale checks, ensuring that vendors and their homebased suppliers comply with labelling requirements;

"To add to that,… at the point of sale… our officers do go and check…. For example,… these days… we have…. what we call 'dessert house vendors'. These vendors gather products from various home-based sellers and help sell them in exchange for a small commission. When our officers visit such places…, they look at the overall setup. For instance, …they check the product labelling. We make sure that the vendor ensures their suppliers… comply with proper labelling requirements…. aaa….and when the vendor then tells the home-based producers, 'You must follow this label format,' they indirectly end up following the Ministry of Health's requirements."

Respondents 5 and 7 highlighted that MOH officers trace the source of food served at events by working through the organisers and vendors as stated below;

"So usually, for events…or large functions,….the MOH will approach the organiser, and from there we trace back who actually prepared the food that was supplied to these vendors."

Moreover, another respondents of 4, 6, 8, 11, 13 and 14 explained that state officers carry out home or kitchen inspections only when necessary, based on the specifics of each case. For instance, visits are performed selectively, depending on the quality of documentation and any concerns raised. Thus, the respondents commented;

"It really depends on the case… it's not compulsory for us to go. For example, if the applicant just sends us photos….sometimes we ask them to send pictures….and if those photos look a bit doubtful,…. or the address doesn't seem like a proper home address,… then we'll go out and verify it…. That's why we say it's case by case. If we're satisfied with their documentation, then there's no need for a kitchen inspection and so on. It also depends on each state. The states are closer to their communities, so if they decide they want to do a kitchen visit,…. then they'll go….. If not, they won't….we don't make it mandatory."

Respondents 3, 7, 12 and 13 also added that applicants (homemade food producers) must meet certain minimum requirements including submitting photos and a simple sketch of their kitchen layout;

"Aaa Maybe… perhaps that's what they're referring to. But we do have a minimum requirement. At the very least, they must provide photos and also sketch out their kitchen layout…how everything is arranged and so on."

5.3.2.4 Co-operation & Partnerships

The respondent explained that awareness efforts rely heavily on cooperation with partner agencies, using joint engagement and shared outreach activities to encourage more applicants.

"We already have more than 600 people certified… but if you ask about their level of awareness, we don't have that data. We haven't conducted any awareness studies because our focus has been more on encouraging more of them to apply. We do, however, carry out a lot of engagement with other agencies…giving briefings and so on. That's how we create awareness among the public. We do TV promotions, pamphlets, flyers… all of that. We're involved in quite a lot."

Meanwhile the following statement reflects the respondent's explanation of how HQ works collaboratively with supermarkets using partnership-based requirements to encourage homebased suppliers to obtain certification;

"We also have other approaches. For example,… we engage with agencies such as supermarkets…. When we have discussions with supermarkets,… we propose that they set certain conditions for their suppliers…or for the food outlets in their food courts. If any of these outlets source from home-based suppliers, they should ensure that those home-based suppliers at least hold our certificate….. aaa…that is one of the approaches we use at

headquarters to encourage those who do not yet have the certificate to apply for it and comply with the minimum requirements."

5.3.2.5 Communication & SOP Dissemination

The respondents highlighted that the dissemination of SOP requirements is done through direct communication with applicants, while physical inspections or home visits occur only when the provided documents or product details appear questionable as stated below;

"So… it's not a main requirement. We just ask them to send photos…pictures of their kitchen, where they prepare the food, where they do the packing… all of that. And then we verify the documents they've submitted. That's it. We only go out if something seems doubtful, or if the product is something we've never seen or heard of in Malaysia—something that doesn't seem to exist here. In those cases, we'll make a visit. And when we do go, it's not for enforcement. We go to help them… that's all. But this applies only to those who apply for certification. For those who don't apply, we won't randomly turn up… suddenly visiting people's homes can be dangerous."

Respondents were also asked what SOPs home-based producers should follow and how officers communicate these requirements to ensure understanding. They commented that;

"We have one general guideline—that's the SOP we mentioned earlier, the one we share with applicants. That one exists. Then there's another guideline specifically for those applying for the certificate and wanting to use the logo. But we also have a separate guideline for those who want to ensure safe food preparation at home. It's more general… it covers basic safety standards and follows the usual food-handler requirements. We don't have anything specialised just for home-based producers. In America, they do have one, but here we don't."

5.3.2.6 Education & Awareness Strategies

According to respondent 6, the voluntary nature of Malaysia's food safety schemes means that home-based producers may fully comply with safety practices even without holding formal certificate as stated below;

"If I were running a home-based food business myself... and I chose not to apply for any certification, that would be fine. Legally,...as long as...the food is safe,... there is no issue. It's similar... to what I mentioned earlier about factories... the law requires them to have a food safety assurance programme,...but the law doesn't specify exactly which certificates they must hold.... So, not having a certificate doesn't prove that they are not managing their food safety.... They may well be controlling it properly...they simply choose not to obtain formal certification. Do you see what I mean?... It's the same for home-based businesses.... I could be operating from home and still manage my food safety properly. Even for us, SPTM qualification,... as Food Technologists, we probably understand food safety aspects even better. But even then, I personally might decide not to take any certificates... That doesn't mean I am not complying with food safety... Isn't that right?"

Respondents 9 and 11 explained that MOH adopts an educational, awareness-based approach rather than enforcing compulsory requirements for homebased food producers as shown below;

"We have to understand that,...as a government agency,...our approach is more educational. We focus on creating awareness....We can't simply impose things outright...we can't do that.... Malaysians are known for being...courteous and diplomatic, so our approach has to be gradual....We educate them slowly...Those who already comply, we award them a certificate...or provide some form of recognition... That way, consumers can see...this one complies,...this one is not yet compliant,...or this one is gradually becoming more aware....We don't force anyone. It isn't compulsory under the regulations."

The following statement illustrates respondent 3's opinion that during busy periods, caterers and vendors rely on homebased producers but still require them to meet basic food-safety obligations or requirements;

"At the same time, these vendors won't accept products unless…. the supplier meets certain basic requirements. For example, if I want to send my kuih (dessert) to a vendor, the vendor will ask,…'Have you had your typhoid injection? Have you completed your food-handler training?'…. If the supplier doesn't have these two things, most vendors simply won't take the products…..This also applies to larger suppliers,… especially during festive seasons or big events…. where catering companies need to prepare food in large quantities. In those situations,…. caterers will also outsource certain items to homebased producers….For example, something like 'roti jala'… is very time-consuming. If a caterer had to make a thousand pieces, they would spend an entire day on that alone. So they pass it to vendors, who will then distribute the task ….maybe 500 pieces to one homebased producer, another 500 to another. ."

Meanwhile the following excerpt illustrates the respondent's view that certified food-handling training is central to educating food handlers and strengthening their awareness of safe practices;

"And…another thing…our requirement for food handlers is that they must attend a food-handling workshop or training session, which… they only need to do once in their lifetime…. The training is conducted through private training centres, where certified trainers are available, and these trainers are also certified by us. After that, the centres are free to run their own courses,… just like driving schools. For example, if you set up your own food-handling training institute, you would simply need to find at least one certified trainer….someone who is also recognised by the Ministry of Health…to conduct the classes."

Furthermore, the respondent highlighted that the growing involvement of well-educated individuals, who bring stronger awareness of food safety, is changing the landscape of home-based food production as demonstrated below;

"For your information, in the early days of our homebased programme,…. we imagined it would mostly involve housewives just ordinary home cooks. But now, that's no longer ….the case. The level of education is different… they're genuinely committed,…. they're dedicated, and they bring their own knowledge and awareness ….into the work. For example, even some of our own food technologists are highly educated people and running their own home-based bakeries."

Several respondents also concurred that communication with homebased producers centres on disseminating the minimum labelling requirements, supported by the broader labelling guidelines under the Food Act. The following quotations show their views;

"Yes, we do have the green book on labelling, right… but for home-based producers, we only require the minimum labelling…. The book is titled *'Guidelines on Labelling Requirements under the Food Act 1983 and Regulations Thereunder'*…. But Madam Husmila, it's general…it's not specifically for homebased businesses. It applies to everyone. Even though it's called 'general labelling', the book is nearly 190 pages, I think… You should be able to find it on the MOH website,…and I'll share it with you as well."

5.3.2.7 Competence and Risk Management

Given that homemade food producers remain legally bound by existing food laws, namely the Food Act and Food Safety Regulations, respondents were questioned whether their specific food handling practices are being checked through home. For example, the respondents said;

"Yes, we do… but it depends on the case… The state level will handle it; the headquarters (HQ) doesn't do it. You're probably wondering why we were told to carry out a visit…well, it's because she applied for a certificate. So we went to have a look… whether she lives in a flat or a terraced house, and the overall setup of how she prepares the food for her business."

Furthermore, the following statement reflects the respondents' 11, 12 and 14 explanations of how homebase producers' competence in basic food-handling practices and their ability to manage risks throughout production are essential for maintaining safe and consistent food quality;

"What we can do, and what we advise food producers… starts with the basics. First,… they need to understand the practical aspects of what they are doing. If they really understand their own practices, then, God willing, the quality of what they produce will also be good. If they understand the fundamentals…how crucial it is to handle raw materials properly, how to manage the process from start to finish, and even how to ensure that the food remains controlled and safe when it is finally served to customers…that understanding is absolutely essential. In my personal view, that knowledge and sense of responsibility form the foundation. Sometimes, the owner is very responsible, but the workers can be rather careless."

As described by the respondents 8, 9, 11, 12 and 13, equipping trainers with both technical knowledge and strong teaching abilities is a key safeguard for reducing risks in the food-handling process. The respondents said;

"Well… one part of it involves the food technologists, and the other part relates to the training we provide to the certified trainers…Their training is more focused on public-speaking skills…so, although they already have the technical knowledge, we expose them to how to interact effectively with others. It's essentially about teaching techniques and how to deliver information clearly."

In addition to the above views, respondent 12 and 13 noted that the move to require five-yearly retraining is intended to strengthen competence and reduce risks associated with outdated food-handling practices.

"This means that if they attend the food-handler training once… we are actually in the process of amending the legislation to make it compulsory for food handlers to attend the training again every five years".

5.3.2.8 Food Safety Governance and Continuous Improvement

Respondents did not propose entirely new measures. Rather, they emphasised that the existing framework is already comprehensive at the outset and necessarily involves multiple agencies beyond the MOH. Their reflections converged on inter-related themes of enforcement, health education, awareness, commitment, and financial constraints, alongside multi-agency governance, cultural and benchmarking considerations, economic trade-offs, sectoral differentiation (factory versus homebased), and the professionalisation of home-based producers. The following map summarises the overall themes (Figure 5.14) ;

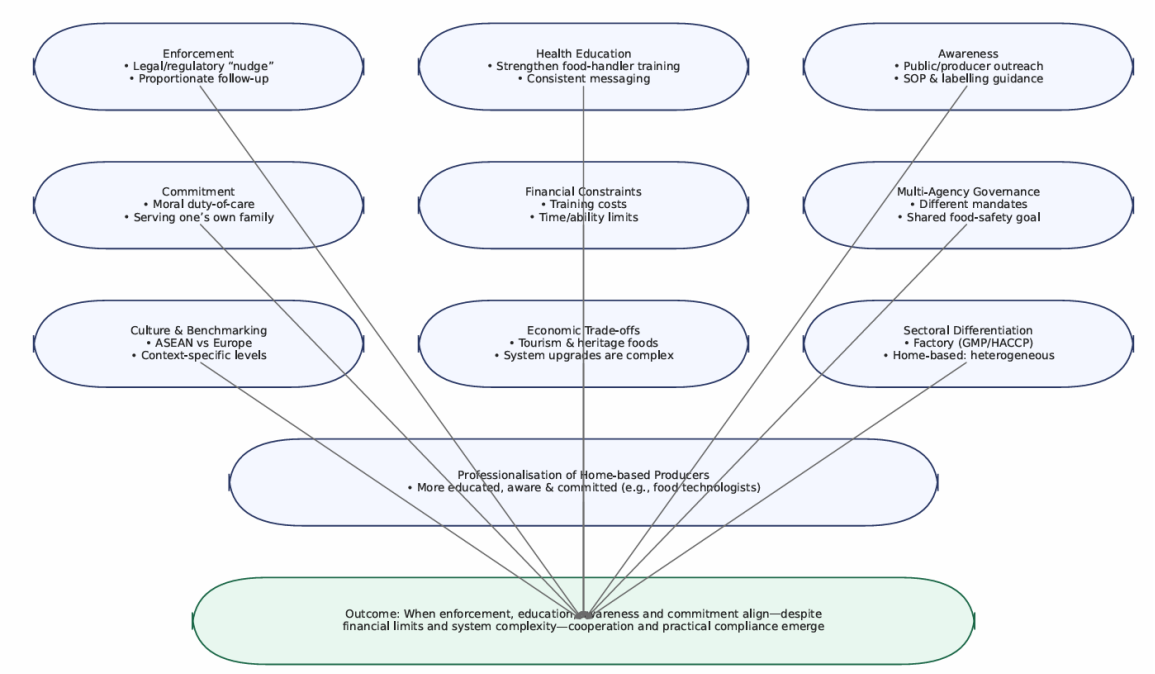


Figure 5.14
Overview of Respondents Perspectives on Food Safety Governance and Continuous Improvement

Respondents consistently framed progress as resting on a balanced combination of enforcement, health education and awareness, underpinned by the personal commitment of producers. When these mechanisms are done properly, cooperation with partner agencies tends to emerge organically and routine compliance runs on its own (Interview : FT07). One respondent captured the moral dimension succinctly:

"Even as a food handler, I would want to comply…who doesn't want safe food? At the end of the day, we serve our own families; no one wants to be held responsible for harm." (Interview : FT11).

At the same time, food-handler training was identified as an area that "needs strengthening", as some treat it casually or intermittently. (Interview: FT03). In summary, enforcement, education, awareness and commitment were described as the consistent pillars which is tempered by real-world constraints (Interview: FT12).

Furthermore, respondents repeatedly highlighted financial and individual constraints such as the cost of training, limited time, and varying personal circumstances. These constraints "are not the same for everyone" (Interview: FT02). Against this backdrop, respondents endorsed a pragmatic stance: provide awareness and follow with proportionate enforcement as a "nudge" towards compliance (Interview: FT07).

Respondents also highlighted that different agencies operate under different mandates and regulations, yet the ultimate goal is shared; food safety. System upgrading is complex because policy choices can intersect with economic priorities. One example concerned tourism promotion of unique traditional foods (e.g., dishes cooked in bamboo), where regulators must weigh economic benefits against food-safety risks:

"Upgrading the system is complex…tourism may promote unique foods, and we worry about risk; economic factors have to be weighed." (Interview: FT09).

Despite all of the above, several respondents cautioned against simple cross-regional benchmarking. Discussions at the ASEAN level highlight that compliance behaviours differ from European and other contexts, and that attempting to "equalise" standards can be unrealistic when starting levels diverge (Interview: FT08). As one participant reflected:

"We shouldn't use the US as a benchmark here; once basic requirements are met, many of our home-based producers are already at an acceptable level." (Interview: FT10).

Respondents also remarked that Malaysia complies with most basic food-safety requirements compared with many countries, reinforcing the need for context-sensitive governance (Interview: FT06).

Meanwhile, in the aspect of sectoral differentiation, respondents distinguished between factory settings where GMP/HACCP audits enable tighter oversight and homebased operations, which are more heterogeneous but not inherently non-compliant (Interview: FT01). Foodborne

illness, they noted, is a global phenomenon and not specific to homebased businesses (Interview: FT13). Indeed, many homebased producers already meet basic requirements, and some are "very strict" about food-hygiene practice (Interview: FT04). Respondents therefore questioned the value of using US standards as the benchmark, arguing that compliance with local basic requirements often indicates no significant issues.

Finally, respondents observed a shift in the profile of homebased producers. Early images of informal, domestic operators have given way to more educated, highly aware and committed individuals including food technologists operating home bakeries (Interview: FT14). This professionalisation was seen as supportive of compliance and aligned with the broader governance approach.

5.4 Focus Group Analysis

Section 5.3 presented the findings from the semi-structured interviews, from which eight (8) main themes emerged. These findings informed the development of questions for the third stage of the study, which involved focus group discussions on food safety governance in Malaysia. This section is organised into two parts. The first presents the profiles of the respondents (Section 5.4.1), while the second analyses their views according to five (5) main themes (Section 5.4.2). Respondents were categorised into two groups; home-based food producers and Food Technologists. Three (3) focus group discussions were conducted, comprising one (1) group of home-based food producers (n = 6), one (1) group of Food Technologists (n = 6), and one (1) mixed group of home-based food producers and Food Technologists (n = 6), as determined in the third stage of the study.

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5.4.1 Respondents Profile

All focus group members maintained their anonymity, identified by codes. Both homemade food producers and food technologists used pseudonyms (e.g., HF01, FT05). Demographic information and details regarding respondents can be found in the following subsections (5.4.1.1 to 5.4.1.5).

A total of 18 respondents took part in the focus group discussion. This included six (6) homemade food producers and twelve (12) food technologists; all of whom were native Malay speakers. All participants contributed voluntarily. The inclusion of both homemade food producers and field experts (food technologists) offered a rich comparative understanding of enforcement realities, educational needs, awareness challenges, commitment factors and financial limitations that shape food safety governance in Malaysia.

5.4.1.1 Age Range

Participants represented a wide age distribution, reflecting the different generational entry points into the food industry. Homemade food producers mainly comprised individuals aged 25–44, consistent with the demographic commonly involved in online micro-enterprises. Meanwhile, food technologists were largely 35–54, aligning with the length of service and seniority described in the following table 5.22 such as those who have started their service since year 1999.

Table 5.22
Age Range of Respondents

Age Range	Frequency	Percentage
Under 18	0	0%
18–24	1	6%
25–34	6	33%
35–44	4	22%

45–54	5	28%
55 and above	2	11 %

The predominance of respondents in the 25 – 54 age group reflects the active working population in Malaysia's informal food sector and the professional cohort within government food safety roles.

5.4.1.2 Gender

Gender representation in this study was relatively balanced among homemade food producers, while food technologists showed a higher proportion of female officers; consistent with the table 5.23 below, which included senior female technologists from HQ who has served in FSQD since 2004.

Table 5.23
Respondents' Gender

Gender	Frequency	Percentage
Male	7	39%
Female	11	61%
Prefer not to say	0	0%

This distribution aligns with the increasing presence of women in Malaysia's food technology and community-based small and medium enterprise (SME) sectors.

5.4.1.3 State of Residence or Work

Respondents were drawn from various Malaysian states and federal territories, reflecting the geographical distribution of home-based food activities and the administrative contexts in which food technologists operate. Several participants reported experience across federal, state and district levels of the Ministry of Health, as illustrated by one officer: *"I've served in the laboratory, the State Health Department, and at MOH Headquarters in Putrajaya."*

Homemade food producers were primarily located in urban and semi-urban areas where online food entrepreneurship is more prevalent. Representation from both East and West Malaysia indicates a diverse range of perspectives captured in the focus group discussions. Table 5.24 presents the distribution of the 18 participants (6 producers and 12 food technologists), showing coverage across key Malaysian regions.

Table 5.24
State of Residence or Work

State / Territory	Frequency	Percentage
Selangor	2	11.1%
Kedah	1	5.6%
Kelantan	1	5.6%
Penang (Pulau Pinang)	2	11.1%
Johor	2	11.1%
Perak	2	11.1%
Kuala Lumpur	2	11.1%
Putrajaya	2	11.1%
Sabah	2	11.1%
Sarawak	2	11.1%

5.4.1.4 Respondent Roles

The distribution of respondent roles reflects the dual focus of the study; grassroots experience of home-based production and the regulatory/technical perspective of those governing food safety in Malaysia.

Table 5.25
Respondent Roles

Role	Frequency	Percentage
Homemade food producers	6	33%
Food Technologist	12	67%
Other	0	0%

The findings reveal that several food technologists in the FGDs were highly experienced, with long service records such as one who "has served since 1999" (27 years of experience by 2026) and another who has been with FSQD for "21 years". This enriched the discussion with insights into policy implementation, enforcement challenges, and historical evolution of Malaysia's homemade food safety governance.

5.4.1.5 Years of Experience in Food Business or Food Safety

The respondents showed considerable variation in experience levels as demonstrated in table 5.26. Homemade food producers tended to have 1–5 years of experience, often beginning during or after COVID-19 when digital platforms boosted online food entrepreneurship. Conversely, food technologists typically had more than 10 years of service.

Table 5.26
Respondent Experience

Years of Experience	Frequency	Percentage
Less than 1 year	1	6%
1–3 years	3	17%
4–5 years	3	17%
6–10 years	4	22%
More than 10 years	7	38%

The long-serving technologists contributed historical and structural insights about Malaysia's regulatory approach.

Therefore, the profile of respondents demonstrates that the focus group discussions included a diverse and experienced group capable of offering deep reflections on enforcement realities, educational gaps, awareness needs, commitment issues and financial barriers in Malaysia's homemade food ecosystem. This diversity supports a robust thematic analysis across the five (5) themes presented in section 5.4.2.

5.4.2 Data Analysis

Each focus group discussion was audio-recorded and fully transcribed into Microsoft Word, generating a total of 54 single-spaced pages of textual data. Data management and analysis were supported using NVivo software (Version 14), where each focus group was treated as a standalone analytical unit. Visual tools, including project maps and charts, were developed to support analysis and to illustrate patterns across demographic classifications, consistent with recommended qualitative data management practices (Jackson & Bazeley, 2019). The focus group discussion guide was informed by the findings from stage two of the study and developed in accordance with the principles of thematic analysis.

1) What do you see as the main challenges in ensuring food safety among online homemade food businesses in Malaysia?
2) How effective do you think current food safety guidelines and policies are for homemade food producers, and what improvements would you suggest?
3) What role should digital platforms (e.g., Grab, Shopee, Facebook) and authorities play in supporting food safety and business registration for homemade food producers?
4) What types of support, training, or resources would help improve food safety practices among homemade food producers?
5) How can communication and cooperation between homemade food producers and food technologists be strengthened to improve food safety outcomes?

Analysis of the focus group data produced a total of 55 codes, which were subsequently consolidated into five (5) primary themes (see Table 5.27). A comprehensive overview of the themes and associated sub-themes is presented in Appendix 3.8, together with project maps illustrating the analytical structure of each theme.

Table 5.27
Themes Developed from Focus Group Discussions

No	Themes
1.	Enforcement
2.	Health Education
3.	Awareness
4.	Commitment
5.	Financial Restrictions

In presenting the findings, both verbatim quotations and excerpts from group discussions were utilised to represent participants' perspectives. This approach recognises the interactive nature of focus groups, where participants may articulate experiences and viewpoints that do not typically emerge in one-to-one interviews. Prior research highlights that group interaction can enhance the depth and credibility of qualitative data by encouraging reflection, clarification, and shared meaning-making (Peek & Fothergill, 2009; Morgan, 1997).

5.4.2.1 Enforcement

Enforcement emerged as a key theme across the focus group discussions, highlighting the relationship between regulatory expectations, the voluntary nature of current governance mechanisms, and the operational realities of home-based food production in Malaysia. Unlike formal food premises where compliance is governed by statutory requirements, homemade food producers operate within domestic settings that fall outside conventional regulatory frameworks. This theme reflects participants' accounts of how enforcement operates in practice and its implications for food safety in the expanding online homemade food sector.

These perspectives were informed primarily by experienced food technologists, some with over 20 years of service in FSQD, alongside reflections from producers operating without the structural support of formal premises.

The theme is organised into five subthemes: (i) voluntary versus mandatory regulatory positioning, (ii) point-of-sale enforcement practices, (iii) vendor-driven enforcement through supply chains, (iv) inspection strategies, and (v) traceability limitations. Together, these

illustrate an enforcement model that emphasises education, minimum requirements, and community protection, while accommodating constraints related to privacy, resources, and social acceptance.

i) Voluntary vs Mandatory Regulatory Positioning

A key enforcement constraint identified by food technologists is that home-based food operations are not legally classified at the same level as factories, restaurants, or licensed premises. As a result, they are not subject to the same formal enforcement mechanisms. As one participant explained:

"Home based food production is not the same as a factory. We cannot expect them to have manuals or full documentation. They are not operating in a permanent food premises facility, so for now, they do not fall under that part of the legislation" (Focus Group B).

Participants highlighted the need to balance regulatory expectations with the realities of domestic environments, which are private and highly variable. Differences in housing types make uniform enforcement difficult to apply.

This regulatory position shapes enforcement practice. While the Food Act 1983 sets clear safety requirements, these are not directly imposed unless producers voluntarily seek certification. Enforcement therefore operates indirectly through voluntary compliance schemes rather than statutory penalties. As another participant noted:

"We have created a voluntary form of control. We award the certificate when the producer meets the minimum requirements. But we cannot force them, and we cannot punish them for not participating." (Focus Group B).

Broadly, this subtheme highlights the tension between ensuring food safety, the limitations of regulating private domestic settings, and the need to avoid intrusive enforcement. This results

in a moderated governance approach that emphasises education, voluntary compliance, and supportive engagement over strict legal enforcement.

ii) Point-of-Sale Enforcement Practices

As direct enforcement within domestic settings is not feasible, officers rely on point-of-sale (POS) monitoring as the primary enforcement mechanism. As explained by food technologists in Focus Group B:

"We are concerned about the fact that the food is prepared at home and then sold to the public, so the safety of the buyer is our priority. That is why our monitoring is carried out at the point of sale."

Enforcement therefore takes place at locations where products are displayed or sold, such as markets, roadside stalls, cafés, or collection points, regardless of whether transactions originate online or offline. This approach enables officers to assess products, labelling and storage conditions without entering private homes, ensuring oversight at the stage where food reaches consumers.

However, participants noted limitations of this approach, as POS monitoring does not capture conditions within domestic kitchens, including hygiene practices or food preparation processes. It may also allow temporary compliance during inspections. Despite these constraints, technologists identified POS monitoring as the most practical enforcement strategy within current legal and operational boundaries.

iii) Vendor-Driven Enforcement Through Supply Chains

An additional enforcement mechanism was identified through market intermediaries such as vendors, supermarkets, and caterers, who impose their own requirements on suppliers. As one officer noted:

"Vendors will not accept products if the supplier has not received their injection or has not attended the food handler course. They themselves will ask, 'Have you gone for training?" (Focus Group B).

Participants indicated that these actors function as informal enforcers of food safety standards, driven by the need to maintain reputation, manage risk, and ensure consumer trust. This is further reflected in the accounts of homemade food producers:

"Caterers often distribute orders of five hundred portions to home based producers, and when there is a large event, the Ministry of Health can trace back who prepared the food. That is why it is so important for us to follow the recommended practices, so that any future problems can be avoided. The scariest thought is that our food could be the reason someone falls ill." (Focus Group C).

These findings suggest that supply-chain relationships create a form of indirect enforcement, where traceability and vendor requirements compensate for the absence of formal regulatory mechanisms. This also shifts partial responsibility for compliance to intermediaries integrating home-based products into their operations.

iv) Case-by-Case Inspection : Balancing Education and Enforcement

Inspection practices are not standardised and are instead triggered by specific circumstances identified by officers. In cases where documentation appears unclear or inconsistent, site visits may be conducted to verify details. As one participant explained,

"If the photographs look doubtful, or if the address does not resemble a proper home address, we will go and verify it. It is handled on a case-by-case basis." (Focus Group B). In addition, inspections are initiated when officers encounter unfamiliar or potentially high-risk products, as reflected in the statement, *"If we come across a product we have never seen before, we will go out and inspect it."* (Focus Group B).

Furthermore, inspections frequently arise from complaints or foodborne illness incidents, indicating a reactive approach to enforcement. Participants described how tracing is often conducted through vendors or event organisers, particularly in situations involving public events. For example, one producer noted,

"Every week I receive orders for school events or community functions. People know me as the 'durian crepe vendor', so I am very particular about ensuring that the food I prepare never exceeds its expiry date and is always safe to eat. I do not want anyone's health to be at risk because of my product. At the end of the day, if anything happens, the school will ask, 'Which vendor did you order from?" (Focus Group C).

Similarly, officers highlighted formal investigation processes, stating,

"We receive reports from consumers whenever there is a suspected case of food poisoning. For our food poisoning investigation unit, especially in serious cases involving fatalities, it is our responsibility to thoroughly trace the source and identify the cause. Any vendors involved can be tracked and held accountable." (Focus Group A).

In addition to these factors, inspection practices vary across states depending on local judgement and proximity to communities. Officers emphasised that state-level discretion plays an important role, as illustrated by the statements,

"States are closer to the communities, so if they decide that a visit is necessary, they will go." (Focus Group B) and *"In Kelantan, whenever someone applies, the officers will go and conduct the visit."* (Focus Group C).

This variation demonstrates that enforcement is context-sensitive and influenced by resource availability, certification practices and the need to maintain community trust.

Importantly, participants consistently emphasised that inspections are intended to support rather than penalise producers. As one officer stated,

"When we visit, it is not for enforcement. We go to help them." (Focus Group B).

Collectively, this reflects an education-focused approach in which inspections function as opportunities for guidance, reinforcing a supportive rather than punitive model of enforcement.

v) Traceability Limitations Affecting Enforcement

Participants highlighted significant challenges in tracing non-certified home-based producers, particularly those operating casually, seasonally, or intermittently, such as festive sellers or those supplying through intermediaries. As one food technologist noted:

"Some producers are not yet listed anywhere, so we may only check them once they begin supplying to a caterer." (Focus Group B).

Traceability was reported to rely on supply-chain visibility, platform records, complaint reports and voluntary certification databases. In the absence of formal registration, enforcement agencies face difficulties identifying producers, verifying production locations, and tracing food batches following contamination incidents.

These findings indicate that enforcement operates within a governance context shaped by voluntary compliance, privacy considerations and domestic production settings. Key characteristics include reliance on voluntary certification rather than compulsory registration, point-of-sale monitoring, vendor-driven enforcement, selective inspections, and persistent traceability gaps that limit proactive enforcement.

Generally, enforcement is described as supportive, educational and largely reactive, aligning more closely with risk communication than punitive control. This theme also links closely to

health education, as enforcement practices are closely associated with training, guidance and awareness-building among home-based producers.

5.4.2.2 Health Education

Health education emerged as a central theme across all focus groups, reflecting the view that safe homemade food production depends on knowledge, skills and continued exposure to appropriate hygiene practices. While enforcement provides a structural framework, participants consistently emphasised education as the main driver of behavioural change, particularly for home-based producers who operate without formal systems or infrastructure. Food technologists, many with over 20 years of experience in FSQD and state operations, highlighted that Malaysia's regulatory approach is "education-first", shaped by cultural norms of engagement and gradual learning. As one participant explained:

"As the government, our approach is primarily educational. We educate them gradually, step by step, by raising awareness. We cannot simply impose everything on them at once." (Focus Group B).

Participants also noted practical challenges, including time, cost, accessibility, and limited follow-up, which affect participation in training, knowledge retention, and consistent compliance.

This theme comprises six interrelated subthemes: food handler training as a core requirement; diverse training delivery models; on-site coaching and case-by-case support; challenges in knowledge retention; the role of awareness campaigns and inter-agency outreach; and continuing educational gaps. Together, these findings indicate that health education functions not only as a knowledge-transfer mechanism but also as a means of promoting shared responsibility and sustaining safe practices among home-based food producers.

i) Food Handler Training as the Core Educational Requirement

Food Handler Training was consistently identified as a core component of Malaysia's food safety framework. Participants noted that all food handlers, including those operating in home-based settings, are required to attend certified training provided by MOH-recognised institutions. As one officer explained:

"Food handlers are required to attend a workshop or training session, and they only need to do this once in their lifetime." (Focus Group B).

The training, typically delivered over 38 hours, provides foundational knowledge on hygiene, contamination prevention and legal requirements. However, participants highlighted limitations of the "once in a lifetime" model, particularly in sustaining long-term food safety practices. As one technologist mentioned:

"Most food handlers eventually forget what they learned, especially when they have not practised those skills for a long time." (Focus Group A).

In response, participants suggested the need for periodic retraining to ensure knowledge remains current. As indicated:

"There is an ongoing legal amendment process to require food handlers to attend retraining every five years." (Focus Group A and B).

For home-based producers, particularly new entrants, the training often represents their first formal exposure to food safety principles. Participants emphasised the importance of accessibility and awareness in supporting engagement with training opportunities, as reflected by one producer:

"When we attend the courses or food safety programmes organised by the MOH, that is when we truly understand which aspects need the most emphasis to ensure that the food we produce is safe, clean and of good quality for our customers. It is easier now because we can simply contact the officers or check the MOH website to find a food safety course available near us." (Focus Group C).

ii) Training Delivery Models : Private Centres, Trainers and Institutions

Respondents described Malaysia's training infrastructure as decentralised, with training delivered through certified private providers rather than directly by the Ministry of Health (MOH), similar to a licensing model. Officers (Focus Group A and B) explained that these centres must employ certified trainers:

"We channel the training through private providers. The trainers are certified, and their certification is issued by us as well. It works much like the driving school system, where instructors are authorised by the relevant authority to ensure consistency and quality."

This model enables wider national coverage but also introduces challenges, including variation in training quality, differences in instructional approaches, misalignment with home-based production realities, and unequal access between urban and rural areas.

Participants further noted that MOH seeks to strengthen training quality by equipping certified trainers with both technical knowledge and teaching skills. As one officer emphasised:

"We expose them to teaching techniques and show them how to interact with participants. It is not just about knowing the content, but about being able to communicate it well."

These findings indicate efforts to ensure that training is not only technically accurate but also accessible and practically relevant for participants.

iii) On-the-Ground Coaching and Case-by-Case Support

A notable feature of Malaysia's home-based certification model is the emphasis on personalised coaching, particularly for producers applying voluntarily for MOH certification. Participants highlighted that home visits are conducted primarily for guidance rather than enforcement. As one officer explained:

"Our purpose wasn't enforcement; it was to provide support." (Focus Group B).

In practice, this approach involves reviewing kitchen layouts, assessing utensils and storage, advising on safe preparation practices, and providing immediate feedback. Visits are conducted on a case-by-case basis, particularly when submitted documentation or images raise concerns. As noted:

"If the photos look suspicious… the address doesn't look like a house… we go to verify." (Focus Group A).

Producers also reported positive experiences with this approach:

"When I first started this business, an officer came to my house. I was really worried because I was afraid, they would stop me from continuing my business. But eventually, I was very happy because the officer showed and gave me hands on tips on how to manage my food, especially since it was very difficult to produce my food while using gloves. Alhamdulillah… with the officer's visit, I received very useful guidance that ensures the safety of the food I produce until today." (Focus Group C).

These findings indicate that the certification process is supported by a coaching-based approach, emphasising practical guidance and trust-building rather than enforcement.

iv) Retention Problems and the Need for Continuous Education

Participants identified knowledge retention as a key challenge, noting that food handlers and home-based producers often struggle to apply training consistently over time. As one participant stated:

"Knowledge, attitude, and practice… many food handlers forget when these are not put into practice." (Focus Group A and B).

This issue is further influenced by part-time or seasonal operations, staff turnover, limited supervision, and varying levels of motivation and risk awareness. Participants emphasised that one-off training is insufficient, highlighting the need for refresher programmes, ongoing guidance, and reinforcement mechanisms to support sustained behavioural change.

Respondents also recognised that compliance is shaped by practical and socio-economic constraints. As reflected across groups:

"Sometimes we simply do not have the time, and financial limitations make it even more difficult. Each person faces different constraints, and everyone's situation is not the same." (Focus Group A, B and C).

These findings indicate that continuous education is necessary to support long-term compliance and is closely linked to broader resources and financial limitations.

v) Public Awareness Campaigns and Cross-Agency Outreach

Participants reported that, beyond formal training, the MOH implements a wide range of outreach activities, including inter-agency engagement, public briefings, television promotions, and the distribution of educational materials. As one participant noted:

"We carry out a great deal of engagement with different agencies. We deliver briefings, run television promotions and distribute flyers and pamphlets as part of our awareness efforts" (Focus Group A).

These initiatives target multiple groups, including consumers, producers, intermediaries, and wider communities, reflecting a multi-level approach to food safety education. Participants also highlighted efforts to extend this influence through supply chain actors, such as supermarkets and food courts, by encouraging them to require certification from home-based suppliers. As explained:

"We have discussions with supermarkets, and we encourage them to set conditions that require home-based suppliers to hold our certificate." (Focus Group B).

These findings indicate that public awareness and cross-agency engagement play a complementary role to formal training, extending food safety expectations through both educational and market-based mechanisms.

5.4.2.3 Awareness

Awareness emerged as a key cross-cutting theme linking enforcement practices (Theme 1) and educational processes (Theme 2) to the everyday decisions of home-based producers. Participants described awareness not simply as access to information, but as a continuum ranging from basic knowledge of hygiene and legal requirements to recognising risks, valuing consumer trust, and understanding public health responsibilities. Officers emphasised an "educate-first" approach, which seeks to encourage rather than enforce compliance, while also noting gaps in measuring awareness at a broader population level.

This theme is structured around five subthemes: visibility of compliance through certificates and labelling; public outreach and its measurement challenges; the role of intermediaries and digital platforms in shaping awareness; the need for clearer distinctions between registration, certification and guidelines; and the influence of risk perception, cultural norms, and producer characteristics. Together, these findings position awareness as both a market signal and an individual orientation towards safe food practices.

i) Making Compliance Visible : Certificates, Labels and Point-of-Sale Cues

Participants emphasised that food safety awareness relies on visible indicators that can be easily recognised by consumers, vendors, and producers. A key mechanism is the voluntary certification/logo issued upon meeting minimum requirements, serving as a clear signal of compliance. As one officer explained:

"We issue the certificate to provide recognition, so that consumers can clearly see that…owh this producer has compiled with the required standards". (Focus Group B).

This approach shifts awareness from passive information to visible, market-based signals at points of decision such as purchasing or product acceptance. Participants also noted that monitoring is centred at the point of sale, where compliance cues including labelling, product condition and storage practices are most observable. As described:

"Our monitoring takes place at the point of sale, where the product is already prepared. For example, if a producer makes nasi lemak, they package it and place it at a food stall. Sometimes the stall itself does not prepare all the food; some items are supplied by other individuals. When the food is placed there, the producer is still responsible for ensuring that the product complies with food safety requirements. From our perspective, regardless of the type of food being sold, consumer safety is the top priority, as it involves people's health and lives" (Focus Group A and B).

Labelling was also identified as a key component, with compliance routinely checked and reinforced through vendor requirements. These practices embed awareness within everyday transactions, as producers recognise that adherence to labelling standards is necessary for market participation.

ii) Public Outreach and the Limits of Awareness Measurement

Participants reported that, although outreach and visibility initiatives are actively implemented, there is a lack of formal measurement of awareness among home-based producers. Officers were able to report outputs such as certification numbers and outreach activities but not baseline or comparative data on awareness levels. This creates uncertainty regarding the reach, depth and retention of food safety messages beyond those already engaged in certification. As noted:

"We have already certified more than six hundred (600) applicants, although we do not have specific data on their level of awareness, as no formal assessment has been carried out. Our efforts have instead centred on encouraging greater participation. Much of this work takes place through engagements with a range of agencies, where we deliver briefings and similar activities. Public awareness is also strengthened through various outreach channels, including television features, informational pamphlets and flyers, alongside other promotional efforts."

The outreach approach includes engagement sessions, media promotion, printed materials, and community-level communication aimed at increasing visibility of food safety expectations. However, in the absence of systematic evaluation methods, such as pre- and post-training assessments or coverage indicators, participants acknowledged that conclusions regarding awareness levels across the wider informal sector remain limited.

iii) Intermediaries and Platforms as Awareness Multipliers

Participants highlighted the role of intermediaries such as vendors, supermarkets, food courts and caterers in reinforcing food safety awareness. These actors require basic evidence of safe practice from suppliers, effectively embedding awareness within supply chain interactions. As explained:

"Vendors will not accept your product if you have not had the typhoid injection or attended the food handler course. They will ask you directly, 'Have you gone for training?' If not, they simply will not take your product." (Focus Group A and Focus Group C).

This illustrates how awareness becomes a practical requirement for market entry. Participants also reported that supermarkets impose similar expectations on home-based suppliers. As explained:

"Supermarkets want to be sure their home-based suppliers have the certificate… They will ask for it… 'home-based suppliers must have the certificate'…. before they agree to take the products." (Focus Group B).

In addition, traceability through vendors and event organisers further reinforces this process, showing that awareness is shaped not only at the individual level but through supply chain relationships. These findings indicate that intermediaries function as channels for standardising expectations and reinforcing food safety practices without direct regulatory intervention in domestic settings.

iv) Conceptual Clarity : Registration vs. Certification and Where Guidelines Fit

Participants identified terminological confusion as a key barrier to awareness, particularly regarding the distinction between business registration and MOH certification. They clarified that the MOH scheme is a voluntary certification based on food safety criteria, not a business licence. As noted:

"Many home based producers think this is like SSM registration, but it is not. It is voluntary certification, not a business licence, and we have to explain that repeatedly." (Focus Group B).

Participants also highlighted the absence of guidelines specifically tailored to home based operations. While the Food Act 1983 and related regulations provide general provisions on hygiene and labelling, producers must interpret and apply these to diverse domestic environments. As one officer explained:

"There is no 'home based only' SOP. We have general guidelines, but they must look at the relevant sections of the law because every home setting is different" (Focus Group A).

Awareness therefore involves not only knowledge of requirements but also the ability to interpret relevant guidance. Within the application process, participants described practical requirements such as submitting photographs of preparation areas, layout sketches and product information. When documentation is unclear, verification visits are conducted to provide guidance rather than enforcement. As explained:

"If the documents look doubtful, then we will verify. When we visit, it is not to punish them; it is to guide them and help them improve." (Focus Group B).

These findings indicate that awareness is developed through both documentation and interactive processes that support understanding and application of food safety practices.

v) Risk Perception, Culture, and the Evolving Producer Profile

Participants indicated that awareness is shaped by both risk perception and cultural norms, with many producers motivated by a moral responsibility to ensure food safety for their families and communities. As one officer explained:

"No one wants to be responsible for causing harm. When you cook, you think of your own family first, so you naturally try to keep the food safe." (Focus Group B).

This perspective is reinforced by a culturally sensitive regulatory approach that prioritises gradual engagement and respect for domestic environments. As noted:

"We educate them slowly and respectfully because this is their home. We cannot enter and enforce harshly." (Focus Group A).

Participants also observed changes in the profile of home-based producers, with many now being educated and more aware of food safety expectations:

"The home-based sellers now are very different. Many are educated and take hygiene seriously". (Focus Group A and B).

However, awareness remains uneven, particularly among seasonal or occasional producers who may not retain practices consistently. This has led to consideration of refresher training:

"Some people sell only once in a while, so they forget the practices. That is why we are considering refresher courses every few years." (Focus Group B).

Participants further emphasised the need for context-appropriate approaches, noting that international models cannot be applied directly. As stated:

"We cannot simply copy other countries. Our food, our culture and our community practices are different, so our approach must match our context." (Focus Group B).

As a whole, the findings highlight that awareness is shaped by moral, cultural and contextual factors, with emphasis on developing practical and adaptable guidance to support safe practices across diverse home-based settings.

5.4.2.4 Commitment

Commitment emerged as a central theme across all focus groups, referring to the sense of responsibility, motivation and willingness to maintain safe food-handling practices. Participants indicated that while enforcement and education provide structure and knowledge, compliance ultimately depends on the internal commitment of those involved.

Commitment operates across three levels. At the individual level, producers and household helpers are responsible for applying safe practices in daily routines. At the institutional level, government agencies demonstrate commitment through ongoing education, support and proportionate enforcement. At the collective level, cultural norms and community expectations reinforce the importance of food safety.

Participants emphasised that formal systems alone cannot ensure compliance without consistent personal commitment. As one officer explained:

"In the end, people follow the rules because they want to, not because we force them. Commitment makes the difference" (Focus Group A).

These findings indicate that commitment forms a key behavioural foundation for safe home-based food production, highlighting the role of internal motivation supported by social and institutional contexts.

i) Individual Responsibility and Personal Commitment

Participants consistently emphasised that personal responsibility underpins safe food preparation in home-based settings. While training, certification and voluntary schemes provide guidance, actual compliance depends on individuals applying safe practices in their daily routines. Commitment is therefore reflected in consistent behaviours and decisions within the kitchen.

Participants also noted variation in commitment among those involved in food preparation. Even when business owners demonstrate strong responsibility, helpers or family members may not maintain the same standards. As highlighted:

"The owner may be very responsible, but the helper can be careless, and that creates inconsistency." (Focus Group A).

Commitment was further linked to moral and social responsibility, with participants emphasising the importance of protecting family and community wellbeing. As expressed:

"At the end of the day, we serve our own families as well, so we do not want to be held responsible for harming anyone." (Focus Group C).

These findings indicate that individual responsibility is a primary driver of safe food practices, supported by internal values as well as external guidance. Without such commitment, formal measures alone may not translate into consistent safe behaviour.

ii) Government Commitment: Balancing Education and Enforcement

Participants emphasised that commitment extends beyond producers to include government agencies responsible for food safety governance. Officers described their role as balancing educational support with proportionate enforcement, aiming to encourage voluntary compliance within home-based settings. As one technologist explained:

"As the government, we do our best to provide awareness, and at the same time we apply enforcement to gently nudge people to follow the safety requirements".

This approach reflects a preference for education as the primary mechanism for influencing behaviour, with enforcement used as a supportive measure. Participants noted that such balance

is particularly important in domestic environments, where intrusive enforcement may be inappropriate.

Respondents also highlighted the need for government commitment in maintaining consistent national standards despite differences in regional capacity. As noted:

"Different countries start at different levels. Some are still trying to catch up, but we cannot lower our standards any further." (Focus Group A).

These findings indicate that governmental commitment involves sustained engagement, adaptive communication and sensitivity to local contexts, while maintaining food safety standards. This institutional role supports the development of individual and community-level commitment within the home-based food sector.

iii) Cultural Commitment: How Values Shape Compliance

Participants highlighted that commitment to food safety is shaped by cultural values and social expectations. Officers described adopting a respectful and culturally sensitive approach when engaging home-based producers in private domestic settings. As one officer explained:

"We educate them gradually and politely because this is their home. Our approach must be respectful." (Focus Group B).

Participants noted that this approach avoids intimidation and instead relies on guidance and engagement. It aligns with broader social norms that emphasise courtesy and community harmony, encouraging producers to view safe practices as part of responsible behaviour rather than imposed regulation.

Producers also described their motivation in moral and relational terms, reflecting a sense of responsibility towards others. As one participant expressed:

"We take care because we know our food goes to families. No one wants to harm their community."

These findings indicate that commitment is supported by internalised values and community responsibility. Officers reinforced this through dialogue and trust-building rather than formal authority, creating shared responsibility between regulators and producers.

Overall, the results show that culturally grounded approaches strengthen commitment by embedding food safety within everyday social practices, supporting consistent safe behaviour in home-based food production.

iv) Commitment as Motivation: Personal Drive, Barriers, and Limitations

Participants acknowledged that although cultural and moral motivations support commitment, they are not always sufficient to sustain consistent safe practices. Practical barriers such as time constraints, financial pressures, low risk perception, fatigue and inconsistent discipline among household helpers were identified as key challenges. As one technologist explained:

"Sometimes the barriers are very practical, like not having time, not having enough money or simply having different personal limits. Every individual's situation is different" (Focus Group A).

These constraints illustrate the link between commitment and broader structural factors, particularly financial limitations and gaps in training or knowledge retention. Participants also highlighted differences in motivation, noting that some individuals are less willing to engage with food safety requirements. As reflected by one officer:

"There are people who are not interested in developing themselves. They do not want to engage and they have already decided that they are not going to" (Focus Group B).

Such variation contributes to inconsistent practices across households and within the wider sector. Participants further noted that commitment may differ even among individuals within the same production setting.

To address these challenges, respondents emphasised the importance of ongoing reinforcement, including refresher training and continuous support. These findings indicate that commitment is influenced by both motivation and practical constraints, highlighting the need for sustained support to maintain safe food-handling practices.

v) Commitment and the Evolving Profile of Homemade Producers

Participants described a clear shift in the profile of home-based food producers. Earlier perceptions of informal and low-capacity producers are no longer representative, as many current producers are well educated, digitally literate and more committed to safe practices. As one officer explained:

"Home based producers today are not like before. Their level of education is different, their commitment is stronger and their awareness is much higher."

This transition has contributed to a more professionalised home-based sector. Participants noted that many producers go beyond minimum requirements by improving hygiene practices, organising kitchen layouts and ensuring accurate labelling. As observed:

"Some home-based sellers are very meticulous. They go beyond the basics because they want to uphold quality" (Focus Group A).

However, participants emphasised that this level of commitment is not consistent across the sector. Variation remains, particularly among seasonal, part-time and small-scale producers, some of whom may not perceive themselves as operating formal food businesses. This contributes to uneven adoption of food safety practices.

Participants also highlighted the importance of recognising local context in assessing commitment and standards. Rather than benchmarking against foreign models, emphasis was placed on meeting national requirements. As observed:

"We do not need to compare ourselves to the U.S. If they meet the basic requirements, that is already a level we consider acceptable" (Focus Group B).

In summary, these findings show that while many producers demonstrate increased awareness and professionalism, continued engagement and tailored support remain essential to ensure consistent safe practices across the sector.

5.4.2.5 Financial Restriction

Financial restriction emerged as a central structural barrier influencing food safety practices among Malaysia's home-based food producers. While enforcement, education, awareness and commitment explain behavioural and cultural aspects of compliance, participants emphasised that many challenges arise from limited financial capacity rather than resistance.

For smaller, part-time and seasonal producers, adopting safer practices often competes with household responsibilities, time constraints and limited income. Participants noted that financial limitations affect the ability to participate in voluntary programmes, invest in equipment, attend training, and maintain consistent standards.

This theme comprises five interconnected subthemes that illustrate how financial constraints intersect with broader food safety governance.

i) Cost Related Barriers to Training and Certification

Participants explained that although the MOH certification scheme is voluntary and does not involve direct fees, indirect costs remain significant. These include expenses related to

ingredients, travel, time away from income-generating activities, and requirements such as food-handler training and typhoid vaccination. As noted:

"People face different limitations. For some, it is money; for others, it is time. Their personal circumstances shape whether they can follow the process." (Focus Group B).

These costs were described as particularly challenging for small-scale, part-time and seasonal producers, who often balance multiple responsibilities. Even relatively minor financial and time commitments may discourage participation in certification and training activities, affecting engagement and ongoing learning.

ii) Household-Level Constraints, Opportunity Cost and Time Poverty

Participants highlighted that financial constraints are closelylinked to time limitations**,** particularly among women balancing domestic responsibilities and micro-enterprise activities. Time spent attending training, preparing documentation or improving kitchen conditions often results in lost income or added household pressure. As commented:

"For many of us, setting aside time is difficult. When you have to divide time between family, work and business, training becomes something you cannot easily commit to" (Focus Group C).

Seasonal producers also reported that compliance activities are difficult to prioritise during peak periods. In addition, some participants expressed concern that certification may lead to further financial obligations, such as upgrading equipment or improving packaging. Despite reassurance that the process is supportive, these perceived costs continue to discourage participation.

iii) Infrastructure and Equipment Limitations

Participants highlighted financial constraints related to home infrastructure and kitchen equipment, noting significant variation in domestic environments. As explained:

"Every home is different. A flat, a village house or a terrace house each has its own limitations, and we cannot expect them to be the same." (Focus Group A and B).

These differences reflect underlying socioeconomic constraints, as many producers lack the resources to upgrade kitchens or invest in equipment such as additional refrigeration, storage units or temperature control tools. Participants noted that reliance on shared appliances, limited workspace and multi-purpose domestic areas create structural limitations for maintaining consistent food safety practices.

iv) Economic Pressure within the Governance System

Participants indicated that financial constraints also affect the capacity of government institutions, including MOH, to support and regulate the home-based food sector. System improvements were described as dependent on broader economic considerations, as reflected in the following statement:

"Improving the system is not straightforward because it involves economic decisions. We have to consider many factors before changes can be made." (Focus Group A).

These constraints limit efforts to upgrade systems, develop specialised guidelines, expand inspection capacity and enhance training initiatives. Participants also stated the need to balance regulatory priorities with cultural and economic considerations, including support for traditional food practices.

These findings show that financial limitations influence governance at both institutional and producer levels, shaping the overall environment in which home-based food producers operate.

v) Financial Restriction and the Sustainability of Long-Term Compliance

Participants emphasised that financial constraints affect not only initial compliance but also the sustainability of safe practices over time. Ongoing requirements, such as updating labels, adjusting procedures or attending refresher training, were reported as difficult to maintain. As noted:

"Keeping up with the requirements over time is not easy. When costs add up, some people slowly stop following what they learned."

Maintaining higher safety standards often involves additional costs, including improved ingredients, packaging and equipment. While some producers aim to expand, investments in refrigeration, cooking appliances or dedicated kitchen spaces were described as unaffordable for many. As one officer explained:

"Some want to improve but they simply cannot afford the equipment that would help them do things safely" (Focus Group B).

Participants also highlighted indirect financial pressures from supply-chain requirements, such as vaccination and training, which may restrict access for some producers. As pointed out:

"If they cannot pay for vaccination, they cannot enter the supply chain, so they lose income even if they want to comply" (Focus Group A).

These constraints were described as reinforcing inequalities, whereby producers with greater resources can sustain compliance and expand, while others struggle to meet basic expectations. As reflected:

"Financial limitations determine who gets to continue and who cannot. It affects their future in the business" (Focus Group B).

To summarise, financial capacity was identified as a key factor shaping long-term participation and consistency of safe practices among home-based food producers.

5.4.2.6 Summary of Focus Group Discussion Findings

This section summarised the focus group discussion findings from Food Technologists and home-based food producers in Malaysia, identifying five key themes: enforcement, health education, awareness, commitment, and financial restriction. The findings indicate that food safety governance is largely supported through education and facilitative enforcement rather than direct regulation. Commitment was a key factor influencing safe food practices, while financial constraints limited both producer compliance and regulatory efforts. These findings inform the final chapter, which synthesises the overall study findings and presents recommendations for strengthening food safety governance.

CHAPTER SIX
DISCUSSION & RECOMMENDATIONS

6.1 Chapter Structure and Content

This chapter integrates empirical findings from a nationwide survey, semi-structured interviews with food technologists, and focus group discussions with producers and enforcement officers to develop a comprehensive understanding of food safety governance within Malaysia's online homemade food sector. Bringing together quantitative and qualitative insights and situating them within the existing literature, the discussion is structured around seven (7) key thematic areas, including governance, traceability, enforcement, collaboration, communication, education and competence. Through thematic and cross-thematic analysis, the chapter advances understanding of food safety governance in informal and home-based contexts, introduces a conceptual governance framework to address identified gaps, and concludes with empirically grounded recommendations to strengthen food safety governance in Malaysia.

6.2 The Development of Food Safety Governance

6.2.1 Control, Leadership and Governance

Control, leadership and governance emerged as a foundational theme shaping the operational and behavioural dynamics of Malaysia's online homemade food sector. This sector is characterised by informality, diverse domestic environments and digital marketing practices, requiring governance approaches that differ from conventional regulatory systems. In this context, the Ministry of Health, supported by the Food Safety and Quality Programme and state-level technologists, acts as the central governance authority. This reflects wider evidence that leadership is a key determinant of food safety performance and organisational culture,

where institutional expectations influence behaviour (Griffith et al., 2010; Yiannas, 2009; Jespersen et al., 2017). It also aligns with global observations that informal food systems require adaptive governance sensitive to economic and domestic realities (FAO, 2019; WHO, 2020).

Interview findings indicate that governance is structured through a hierarchical system in which policies and standards are developed at federal level and implemented at state and district levels. This reflects established models of regulatory stewardship (Scott, 2008; Hutter, 2011) and positions officers as custodians of public health. Their roles in setting standards, certification criteria and inspection processes demonstrate how leadership shapes expectations and practices, consistent with Schein's (2010) concept of culture formation. However, participants noted that domestic kitchens fall outside formal regulatory structures, limiting the application of traditional enforcement mechanisms. As a result, governance relies more on guidance, persuasion and voluntary participation, reflecting softer forms of regulation identified in prior research (Yiannas, 2009; Manning and Soon, 2016; Maye and Kirwan, 2013).

The voluntary nature of certification further reinforces this approach. While it reduces regulatory burden and supports accessibility, it also creates gaps in traceability, as unregistered producers remain difficult to monitor. Enforcement therefore becomes reactive, often triggered by complaints or supply chain visibility, rather than preventive. This reflects broader challenges in regulating informal and dispersed systems (Hutter, 2011; Rothstein et al., 2013) and highlights limitations of conventional regulatory models in this context.

Within domestic spaces, leadership is enacted through relational and negotiated practices. Inspections are selective and often limited to cases where risks are identified, with emphasis placed on coaching, guidance and practical support. These approaches promote trust and reduce

resistance, aligning with governance literature emphasising dialogue and interpersonal engagement in community settings (Jespersen et al., 2017; Schein, 2010).

Governance also extends beyond formal institutions through the role of supply chain actors and digital platforms. Vendors and supermarkets impose entry requirements such as training and certification, while online platforms influence behaviour through visibility and reputational pressure. These dynamics reflect the growing role of non-state actors and distributed governance in food systems (Abbott, 2012; Manning, 2018; Gillespie, 2018; Kaye, 2022).

Quantitative and qualitative findings together show that producers generally value food safety but face challenges in consistent implementation, particularly in record-keeping and systematic processes. These limitations reflect common characteristics of informal systems, where knowledge is often shaped through peer networks rather than formal structures (FAO, 2019; Maye and Kirwan, 2013; Spring and Pahnke, 2020).

The findings demonstrate that effective governance in informal food systems depends on relational, flexible and multi-actor approaches. Leadership must prioritise trust, education and collaboration, while addressing gaps created by voluntary participation and structural constraints. This reinforces calls for community-centred governance models (WHO, 2020) and highlights the importance of integrating institutional, market and digital mechanisms to strengthen food safety practices.

6.2.2 Registration and Traceability

Registration and traceability emerged as a critical theme in explaining governance within Malaysia's online homemade food sector, as they determine producer visibility and the ability of authorities to respond to food safety incidents. The findings show that current mechanisms operate in a hybrid space between formal and informal systems, reflecting global evidence that home based and digitally mediated food economies often sit within overlapping regulatory

boundaries (FAO, 2019; WHO, 2020). Traceability is recognised as a core component of food safety assurance, yet its application in domestic environments remains constrained by limited oversight. Governance therefore relies on voluntary participation and complaint driven monitoring.

Interview findings indicate that home-based producers are not required to register with the Ministry of Health unless they seek certification. This creates two groups: certified producers who are visible and traceable, and uncertified producers who remain largely outside institutional oversight. Similar patterns are observed in informal systems where voluntary schemes create uneven visibility (Maye and Kirwan, 2013; Manning and Soon, 2016). Certification therefore functions as a voluntary trust mechanism rather than a mandatory requirement. While this approach supports accessibility, it introduces governance limitations. Findings show inconsistent participation, including non-renewal, incomplete applications and seasonal engagement, which weaken traceability and data reliability. These challenges are consistent with issues identified in voluntary regulatory systems (Hutter, 2011; Rothstein et al., 2013).

Traceability is further constrained by digital and domestic production conditions. Producers commonly operate through platforms such as Facebook, Instagram, TikTok and WhatsApp, which do not require food related registration, creating parallel systems outside formal oversight (Spring and Pahnke, 2020). Domestic kitchens also limit regulatory verification, as authorities cannot impose standard controls on private homes, reflecting FAO's (2019) observations. Traceability is therefore strengthened primarily through supply chain relationships, where vendors impose requirements such as training or certification, consistent with supply chain mediated governance (Manning, 2017). Producers outside these networks are typically identified only after complaints or incidents, indicating a reactive model (Hood et al., 2001).

Implementation also varies across states due to differences in resources and discretion. Some states conduct routine checks, while others rely on selective or complaint-based approaches. This reflects characteristics of decentralised governance systems, where uneven implementation outcomes are common (Scott, 2008), resulting in fragmented traceability practices.

Producer perspectives reinforce these findings. Some view certifications as enhancing credibility, while others misunderstand its distinction from business registration or rely on informal networks for guidance. This aligns with studies showing that informal food systems depend on community-based knowledge rather than formal structures (Maye and Kirwan, 2013; Spring and Pahnke, 2020). Survey results further indicate that although commitment to food safety is generally high, weaker performance in documentation and planning limits effective traceability.

Taken together, traceability in Malaysia's homemade food sector remains partial and uneven. Certified and supply chain connected producers are more visible, while digital only sellers remain outside formal oversight. Governance is largely reactive, certification data are incomplete, and state level variation leads to inconsistent outcomes. These findings reflect broader concerns in informal food systems, where structural and behavioural factors constrain monitoring and protection mechanisms.

This study contributes by demonstrating that traceability operates through a hybrid governance model combining voluntary certification, relational engagement and market-based mechanisms. The findings highlight that traditional registration systems are insufficient for domestic and digital sectors, and that effective governance requires integration of formal oversight with platform-based support, supply chain controls and context specific strategies. Registration and traceability are therefore shaped by the interaction of voluntary systems,

digital practices and domestic production conditions, resulting in evolving but uneven governance outcomes.

6.2.3 Enforcement and Compliance Mechanisms

Enforcement and compliance mechanisms form a crucial lens through which the practical realities of food safety governance in Malaysia's online homemade food sector can be understood. The findings reveal a context in which food is produced in private domestic environments, sold through digital platforms and prepared by individuals whose engagement ranges from casual home cooks to small scale micro entrepreneurs. These characteristics place the sector beyond the assumptions that underpin conventional regulatory frameworks, which typically rely on the ability to monitor formal premises and apply structured inspection routines. Scholarship on informal food systems highlights that enforcement in such settings must be adapted to domestic realities, sociocultural expectations and limited regulatory reach, as noted by FAO (2019) and Maye and Kirwan (2013). Building on this perspective, the theme examines how enforcement operates in practice, how officers navigate the constraints of household production and how compliance emerges through a combination of voluntary behaviours, relational interactions and market-based pressures rather than strict legal control. Interviews with food technologists demonstrate that enforcement begins with an important legal distinction because home-based producers are not recognised as formal food premises under Malaysian food law. As domestic residential spaces, these kitchens cannot be subjected to requirements applied to commercial factories or restaurants, and officers consistently emphasised that they lack authority to demand structural modifications or layout changes. This constraint fundamentally shapes enforcement practice and aligns with regulatory literature which notes that domestic spaces fall outside the scope of standardised food premises control and therefore require alternative forms of engagement, as described by Hutter (2011). Officers

explained that, rather than imposing intrusive inspections within private homes, enforcement is more commonly directed to points of sale such as stalls, school events or vendor distribution centres where products enter public circulation. This outward facing approach reflects attempts to protect consumers without violating household privacy and corresponds with food safety culture research highlighting the importance of respectful leadership and relational trust when engaging producers in informal settings, as emphasised by Jespersen et al. (2017) and Schein (2010). Officers characterised this method as the only viable and appropriate strategy within the structural boundaries of domestic production.

The findings further reveal that inspections for home-based producers do not follow fixed formats associated with formal premises but instead occur only when specific triggers arise. Officers noted that kitchen visits are initiated when documentation appears inconsistent or incomplete, when unfamiliar or potentially high-risk products are submitted for certification or when complaints or foodborne illness investigations require tracing to source. The absence of routine inspection requirements reflects broader challenges of applying standard regulatory instruments to informal domestic contexts and is consistent with observations by Hood et al. (2001) that risk regulation in dispersed settings often relies on situational and discretionary responses rather than uniform protocols. State level discretion plays a significant role in determining whether visits occur, and officers explained that differences in capacity, local practice and case load influence how inspections are prioritised. Producers who participated in focus groups generally expressed appreciation for the flexible nature of these visits, describing them as supportive encounters focused on guidance rather than enforcement. This reinforces the relational tone identified across informal food systems where cooperation, rather than compulsion, frequently forms the basis of regulatory engagement, as highlighted by Manning and Soon (2016).

Enforcement in the homemade food sector often becomes visible through complaint driven mechanisms rather than routine oversight. Officers explained that investigations commonly begin in response to foodborne illness incidents, school event outbreaks or consumer complaints, and that tracing typically starts with event organisers or vendors who can identify the producers involved. This reactive approach reflects the inherent limitations of monitoring unregistered and digitally active producers and aligns with literature noting that reactive enforcement is characteristic of informal and low visibility food systems, as discussed by Rothstein et al. (2013). Producer narratives supported this observation, with some expressing heightened caution when supplying large events because they recognised that such orders increase their traceability and therefore their accountability. However, producers who sell exclusively through digital channels without intermediaries may remain invisible unless a complaint is lodged, underscoring the fragmented nature of enforcement capacity in the absence of formal registration and systematic monitoring.

A significant insight from the findings is the growing influence of vendors and retailers in shaping compliance among home-based producers. Officers observed that many vendors require suppliers to present food handler training certificates, vaccination records or basic labelling information before procurement, while some supermarkets impose their own hygiene expectations as a condition of supply. This form of market mediated enforcement is not mandated by law but emerges organically within commercial supply chains, mirroring observations that private sector actors increasingly adopt regulatory functions in food systems where state oversight is limited, as described by Manning (2017). Vendors reported they were unwilling to accept products from producers lacking documentation because they themselves act as intermediaries accountable for food safety. Such arrangements create pockets of enhanced compliance within supply chain connected operations while leaving other producers outside these expectations. This dynamic aligns with the work of Maye and Kirwan (2013),

who argue that hybrid governance structures frequently emerge in informal economies where responsibility for risk management is distributed across multiple actors.

Across interviews and focus groups, officers consistently described enforcement as an educational process intended to guide rather than penalise producers. When home visits occur, officers approach them as opportunities to advise on food handling practices and address misunderstandings rather than impose sanctions. This approach reflects the relational nature of governance within informal and community embedded systems, where compliance is more effectively fostered through support, communication and shared learning than through coercive strategies, as observed by Jespersen et al. (2017) and Schein (2010). Officers emphasised that their role is to help producers improve rather than enforce punitive measures and that aggressive enforcement would be culturally inappropriate, operationally impractical and damaging to long term trust. This perspective echoes broader findings in food safety culture literature, which show that coaching and education are essential for meaningful behavioural change, especially in environments where structural enforcement tools are limited, as noted by Griffith et al. (2010).

The widespread use of digital platforms such as Facebook, Instagram, TikTok and WhatsApp introduces distinctive enforcement gaps because account creation does not require food safety documentation, and producers can operate anonymously or semi anonymously without entering formal regulatory systems. Officers explained that producers who sell exclusively online may never come to the attention of authorities unless they seek certification or supply to vendors. Digital reviews and ratings influence producer reputation but provide no formal accountability mechanisms. Survey findings reveal that while producers express strong personal responsibility for food safety, they demonstrate weaker behaviours in documentation and structured compliance, with scores in the lower average range. This mismatch between intention and systematic practice reflects the challenges described by FAO (2019) and Spring

and Pahnke (2020), who argue that informal digital marketplaces complicate regulatory visibility and create new risk environments that traditional governance instruments are not designed to manage.

Enforcement within Malaysia's homemade food sector is shaped by multiple structural constraints. These include legal limits that prevent domestic kitchens from being classified as food premises, ethical concerns that discourage random home inspections, the resource capacity of state health offices and the intermittent nature of home-based production. Officers also noted the absence of detailed guidelines tailored specifically to domestic food preparation, which means they must rely on general principles of food safety and food handler training when advising producers. These constraints necessitate a flexible and adaptive enforcement approach consistent with broader governance literature arguing that formal regulatory tools cannot be applied uniformly across diverse settings and must be recalibrated to reflect local realities, as observed by Hutter (2011). The findings thus suggest that flexibility, contextual sensitivity and relational engagement form the foundation of enforcement in informal domestic food systems rather than the command-and-control mechanisms characteristic of factory-based regulation.

This theme contributes to food safety governance by demonstrating that enforcement in informal domestic food systems is most effective when grounded in social trust, educational engagement and relational interaction rather than authoritative inspection. It shows that market-based mechanisms serve as valuable complements to state regulation by embedding food safety expectations within supply chains and vendor practices. The findings also highlight that reactive enforcement is not merely a weakness but a structural reality in settings where proactive oversight is restricted by legal, domestic and digital constraints. Additionally, the analysis underscores that the expansion of digital platforms demands new forms of governance that recognise the fluidity and anonymity of online selling. State level variation, rather than

reflecting inconsistency, represents a practical adaptation to differing capacities and regional dynamics, echoing insights from regulatory scholarship on decentralised governance as discussed by Scott (2008). Collectively, these contributions challenge traditional assumptions about enforcement and provide a nuanced understanding of how compliance is cultivated within informal food economies.

Enforcement and compliance in Malaysia's online homemade food sector therefore reflect a hybrid governance system shaped by the interplay of legal limitations, domestic production environments, digital selling practices and vendor mediated oversight. Rather than relying on rigid inspection-based enforcement, the system depends on educational interaction, complaint driven investigation, discretionary decision making and market-based expectations. Although this model does not achieve full visibility or traceability, it offers a pragmatic approach that aligns with the structural and sociocultural realities of home-based food production. These insights form a foundation for rethinking enforcement in informal food systems and support the development of context appropriate governance frameworks discussed in the subsequent chapter.

6.2.4 Co-operation and Partnership

Co-operation and partnerships emerged as a defining feature of food safety governance in Malaysia's online homemade food sector because they serve as the connective mechanisms that compensate for the absence of formal licensing, the limited reach of state enforcement and the highly diffuse nature of digital food markets. The domestic setting of production and the informality that characterises homemade enterprises mean that regulatory authority alone cannot sustain food safety expectations. Instead, governance depends on a constellation of relationships involving state agencies, vendors, supermarkets, community groups and digital platform users. This reflects broader literature which emphasises that governance in informal

food systems is rarely achieved through hierarchical control but is shaped through negotiated relationships, trust building and shared cultural norms, as discussed by Maye and Kirwan (2013) and Jespersen et al. (2017). It also resonates with multi actor go vernance theories which argue that food safety depends on distributed responsibility and collaboration across institutional and community environments rather than exclusively on statutory authority, as noted by Manning and Soon (2016) and FAO (2019). Within this context partnerships become not only supportive but structurally essential for enabling safe practice in a sector that sits largely outside conventional regulatory frameworks.

The findings show that the Ministry of Health and the Food Safety and Quality Programme invest significantly in outreach and engagement activities designed to support homemade food producers and encourage certification uptake. Officers described sustained efforts to liaise with supermarkets, community organisations and other government agencies in order to increase awareness of safety expectations. This approach aligns with governance literature which stresses that in settings where regulation is limited by legal or practical constraints, agencies must rely on persuasion, communication and relationship building to influence behaviour, as explained by Schein (2010) and Griffith et al. (2010). Partnerships with supermarkets are especially influential because retailers often require certification as a condition of supply, reflecting private regulatory practices identified by Manning (2017) in which market actors act as intermediaries in maintaining food safety standards. Through these partnerships the Ministry extends its influence beyond direct oversight and strengthens the diffusion of safety norms within market channels that reach producers who may never otherwise interact with regulators. Officers also described high levels of co-operation across federal, state and district health offices which collectively implement the food safety agenda for homemade producers. This includes the dissemination of guidelines, sharing of certification records, collaborative responses to complaints and coordinated training initiatives. These interactions reflect the multi

layered nature of public administration described by Scott (2008), in which effective governance depends on communication and alignment across institutional tiers. Although co-operation is a consistent feature of the system, the findings indicate that its intensity varies between states due to differences in staffing levels, resources and local priorities. Such variation aligns with scholarship that recognises the importance of discretion in frontline regulatory work and suggests that decentralised adaptation can enhance responsiveness when grounded in shared national frameworks, as argued by Hutter (2011). In this way co-operation becomes a mechanism through which policy coherence is maintained while allowing room for contextual flexibility.

One of the most distinctive findings is the central role of vendors and small commercial outlets in reinforcing food safety practices among home-based producers. Vendors frequently request food handler certificates, vaccination records or compliant labelling as procurement conditions, and producers acknowledged that these requirements significantly influence their safety behaviours. This form of vendor mediated oversight is consistent with supply chain governance literature which recognises that commercial actors can act as regulatory intermediaries when they impose safety standards to protect their reputation and manage risk, as highlighted by Abbott (2012) and Manning (2018). Officers noted that vendors effectively extend the Ministry's influence by instructing producers on safety expectations, reinforcing Jespersen et al.'s (2017) argument that food safety culture is shaped by interactions across the wider supply network rather than solely within formal organisations. These partnerships create an important traceability bridge for producers who might otherwise remain invisible to the Ministry.

Digital platforms also play an increasingly influential role in the Malaysian homemade food economy. Although they do not verify compliance with food safety standards, they offer crucial spaces in which producers learn, interact and develop shared norms. Focus group participants described relying on WhatsApp groups, TikTok tutorials and Facebook communities to

understand labelling requirements, shelf-life factors and hygiene practices. These peers led exchanges reflect the informal learning pathways noted in studies of small-scale production, where producers depend on social networks rather than formal training, as documented by Spring and Pahnke (2020) and Nyarugwe et al. (2018). While digital platforms do not function as regulatory actors, their influence over producer behaviour aligns with arguments by Gillespie (2018) that digital spaces increasingly mediate everyday governance. In this sense digital platforms become important informal partners in the diffusion of safety norms across a dispersed and largely unregulated sector.

The findings also show that co-operation emerges organically among producers themselves, who share knowledge, discuss challenges and collectively interpret safety expectations. Focus group participants described helping peers understand Ministry of Health guidelines, offering advice on recipe safety and problem-solving issues such as storage and spoilage. These interactions reflect the socially embedded nature of learning in informal food systems and align with arguments by Maye and Kirwan (2013) and Nyarugwe et al. (2016) which highlight the centrality of peer networks in shaping safety culture through everyday practice. Survey findings further reinforce this pattern by showing that producers value shared learning and are willing to improve their practices based on past experiences. This form of community based co-operation provides an important support structure for producers who may lack formal training or easy access to governmental guidance.

Despite their strengths, existing partnerships display fragmentation and limitations. Producers frequently reported difficulties applying general food safety guidelines to domestic environments because no dedicated standard exists for home-based production, creating ambiguity and reinforcing the need for tailored support. Officers also noted considerable variation in state level engagement depending on administrative capacity and local priorities, leading to inconsistent experiences of co-operation across regions. Although digital platforms

encourage knowledge exchange, they do not verify safety credentials and thus cannot serve as comprehensive governance tools. Along similar lines, the absence of structured monitoring mechanisms limits the ability of agencies to evaluate the effectiveness of partnership strategies. These challenges echo broader concerns in governance scholarship which cautions that voluntary and network-based arrangements, although beneficial, can produce uneven outcomes without clearer frameworks and shared accountability, as discussed by De Boeck et al. (2015) and Hutter (2011).

Taken together, the findings suggest that partnerships serve as the backbone of food safety governance in Malaysia's homemade sector by compensating for the limitations of legal enforcement, formal registration and physical inspection. Through collaboration among state agencies, vendors, digital platforms and community networks, the system achieves forms of traceability, knowledge sharing and behavioural reinforcement that would otherwise be unattainable. This reflects broader conceptualisations of network governance which emphasise that effective oversight in decentralised contexts depends on distributed responsibility and multi actor engagement, as argued by Rhodes (1997) and Manning and Soon (2016). Partnerships therefore function as essential governance infrastructures rather than supplemental supports and reveal the relational foundations upon which informal food safety systems depend.

In summary, co-operation and partnerships underpin the functioning of Malaysia's homemade food safety ecosystem by bridging regulatory gaps and enabling practical forms of oversight within a sector defined by informality, domestic production and digital commerce. Through Ministry of Health outreach, vendor mediated checks, peer learning networks and digital knowledge sharing, the system maintains workable levels of safety despite minimal statutory enforcement. These findings demonstrate that relational co-operation is an indispensable

component of governance in informal food contexts and provide a crucial basis for designing governance models that recognise the realities of home-based production.

6.2.5 Communication & SOP Dissemination

Communication and the dissemination of standard operating procedures emerged as a pivotal governance mechanism in Malaysia's homemade food sector because formal enforcement is structurally limited, production takes place in private homes and digital platforms mediate most transactions. The findings demonstrate that in the absence of detailed regulation, communication becomes the principal means through which expectations, knowledge and safety norms are conveyed to producers. This dynamic reflects broader literature which argues that in informal food environments, governance depends heavily on relational communication, interpersonal trust and adaptive interpretation rather than rigid rule enforcement, as noted by Ashkanasy et al. (2000). Communication therefore assumes a regulatory function by shaping awareness, influencing behaviour and enabling alignment between regulatory intentions and everyday practice, a pattern highlighted in cross cultural food safety studies by Nyarugwe et al. (2016). Within this context, communication becomes the practical infrastructure through which Malaysia's food safety objectives are translated into the realities of home-based production.

Food technologists described a communication system that relies on mediated rather than physical contact because officers cannot routinely enter private domestic kitchens. Instead, communication flows through photographs, kitchen sketches, messaging applications and verification of product images and labels. Officers emphasised that the clarity and completeness of these materials determine how effectively they can interpret risks and advise producers, reflecting Denison's (1996) view that consistency and clarity are essential components of effective organisational communication. Key SOP elements communicated

include labelling requirements, allergen identification, cooling procedures, record keeping and basic hygiene practices. Since many producers lack formal training, officers often tailor communication to individual circumstances, particularly when photographs appear ambiguous or incomplete. This personalised approach aligns with Watson et al. (2018), who argue that adaptive communication is essential when formal oversight is limited and organisational actors must rely on interpretive judgement. Consequently, SOP dissemination emerges as a negotiated process shaped by situational context rather than a simple top-down transfer of rules.

Both producers and officers highlighted the absence of a dedicated standard for home-based food production, and this gap creates significant ambiguity regarding appropriate practice. Officers acknowledged that only general food business guidelines exist and producers must interpret these for domestic settings. This challenge mirrors concerns identified by Wallace and Manning (2021), who argue that generic food safety instructions often fail when applied to informal environments that lack structural control. Producers expressed uncertainty about the expectations placed on them, reinforcing Hofstede's (2001) suggestion that unclear communication increases anxiety and inconsistency in high context cultural settings. Misalignment frequently emerges when producers apply household logic to commercial hygiene expectations, revealing a gap between regulatory intent and domestic capability. These conditions make communication more important than written SOPs alone, supporting De Boeck et al.'s (2015) argument that in loosely structured systems, safety outcomes depend heavily on interpersonal interpretation and shared understanding.

A key finding is that producers do not rely solely on official Ministry channels for SOP information but instead depend heavily on digital and peer-based learning ecosystems. WhatsApp groups, TikTok tutorials, Facebook communities and advice from vendors collectively form informal networks where producers exchange knowledge, share experiences and co interpret safety expectations. These patterns reflect Nyarugwe et al.'s (2018)

observation that food safety learning in resource constrained environments is social, participatory and culturally mediated. Producers reported discussing shelf life, packaging, pricing and labelling with peers, and many described learning more from these informal exchanges than from formal guidance. This aligns with Spring and Pahnke's (2020) argument that digital platforms shape informal sector practices by facilitating rapid knowledge circulation. Such communication networks illustrate how governance increasingly occurs in social and digital spaces where producers collectively construct their understanding of safety requirements.

Vendors also emerged as important communicators of safety expectations, often instructing producers on labelling, date marking, documentation and hygiene conditions required for supply. Officers explained that vendors frequently articulate expectations more explicitly than formal guidelines because they have commercial incentives to protect their brand reputation. This reflects Abbott's (2012) argument that regulatory intermediaries play crucial roles in informal governance environments by transmitting expectations along supply chains. Producers confirmed that vendors routinely request documentation before accepting products, indicating that communication from vendors exerts direct influence on production practices. These interactions illustrate what Gillespie (2018) describes as platform mediated governance, as non-state actors communicate rules that function as de facto standards. Although these communications are not legally authoritative, they carry significant practical authority because they determine market access and shape compliance behaviour.

Since officers lack the legal authority to impose structural changes or conduct routine inspections in private homes, communication becomes the primary regulatory mechanism available to them. Officers reported an approach centred on guidance, clarification and support rather than punitive action, reflecting Jespersen et al.'s (2017) findings that behavioural change is more likely when communication fosters trust rather than fear. Officers avoid unannounced

visits due to cultural considerations, legal boundaries and safety concerns, and producers who voluntarily seek certification receive extensive step by step explanations. These practices mirror the relational and adaptive governance approaches highlighted by Manning and Soon (2016), in which communication substitutes for formal enforcement and shapes risk understanding and voluntary compliance. This reliance on interpersonal communication reflects its cultural significance in Malaysian administrative settings where persuasion is often preferred over coercion.

Survey results add further insight into communication patterns. Respondents demonstrated strong interpersonal communication with customers and a willingness to address unsafe practices, with higher mean scores in these areas. However, weaker scores appeared in maintaining awareness of emerging food safety issues and responding consistently to customer feedback. This pattern aligns with De Boeck et al. (2016), who note that informal food producers often excel in front line communication but struggle with systematic knowledge updating due to the absence of structured learning pathways. It also echoes FAO's (2019) observation that informal workers frequently integrate personal responsibility into their work but face challenges with documentation and ongoing learning. These survey findings suggest that while producers communicate effectively within immediate social contexts, they require additional support to sustain long term safety learning and consistent information uptake.

Despite its central role, several factors limit the effectiveness of communication as a governance tool. Officers reported the absence of formal mechanisms for measuring public awareness, making it difficult to determine whether communication strategies achieve their objectives. Producers often misinterpret SOPs and sometimes confuse business registration with food safety certification, revealing gaps in conceptual clarity. Communication styles vary across states, leading to inconsistent understandings of requirements. Additionally, reliance on peer and digital channels can result in producers receiving incomplete or inaccurate

information, echoing challenges noted in informal knowledge sharing literature by Nyarugwe et al. (2016). These issues illustrate that although communication is foundational to governance, it is also susceptible to fragmentation and variability.

In general, the theme contributes to Malaysian governance practice by illustrating that communication functions as the backbone of food safety management in an environment where formal enforcement is structurally constrained. Digital communication fills gaps left by limited physical oversight, vendor instructions operate as informal SOP dissemination mechanisms and community-based learning networks position producers as co educators within the system. This reflects broader perspectives in network governance which emphasise that collaborative communication processes are essential for managing risk in decentralised and informal food systems, as suggested by Rhodes (1997). The findings demonstrate that communication acts not only as a supportive tool but as a substitute regulatory mechanism that shapes behaviour, reinforces expectations and provides coherence within an otherwise diffuse governance environment.

In summary, communication and SOP dissemination play a central role in shaping everyday safety practices among Malaysia's online homemade food producers. With limited capacity to enforce structural standards and in the absence of home specific SOPs, the Ministry of Health relies on adaptive, relational and context sensitive communication channels. These channels include formal guidance during certification, platform-based exchanges, vendor mediated communication and peer learning networks. Although fragmented, these communication pathways collectively form a functional governance system that reflects the social realities of domestic production and the operational dynamics of digital commerce in Malaysia.

6.2.6 Education & Awareness Strategies

Education and awareness strategies emerged as among the most influential governance mechanisms in Malaysia's home-based food sector, largely because the Ministry of Health lacks the legal authority to enforce structural compliance in private homes, making education the primary pathway through which regulators shape behaviour, increase knowledge and encourage voluntary compliance. Unlike formal industries that rely on structured training programmes and mandatory certification, home based producers operate within fluid and resource constrained contexts where learning occurs through a blend of formal training, digital platforms, community networks and market-based interactions. The findings therefore contextualise how education and awareness strategies operate in practice and how they support food safety governance in the absence of strong regulatory tools.

The most consistent formal educational component is compulsory food handler training, accompanied by typhoid vaccination, which officers emphasised as the baseline for certification. These requirements ensure minimum hygiene competence and equip producers with foundational knowledge on contamination, temperature control and personal hygiene. However, the training is generalised and not specifically tailored to home-based production, meaning that risk factors relevant to restaurants or commercial kitchens do not always translate seamlessly into domestic environments. This mismatch can lead to confusion or partial application of guidelines. The system also does not mandate regular refresher courses, although officers expressed a preference for a five-year (5) renewal policy to address knowledge decay. Seasonal producers who operate only during festive periods may experience long gaps between training and practice, a phenomenon officers described as seasonal amnesia where knowledge is forgotten due to infrequent use.

To respond to the unique constraints of home-based production, officers often provide education through informal and on-the-ground coaching. When documentation appears unclear

or when unfamiliar products are submitted for review, officers contact producers for clarification or conduct supportive home visits. These visits are framed as helpful rather than punitive and allow officers to explain SOPs, demonstrate practices and assist with labelling and packaging expectations. This approach personalises learning and delivers guidance within the specific environments in which producers operate, creating a collaborative rather than adversarial relationship between regulators and producers.

Digital platforms also play a major role in shaping producer knowledge. Producers frequently rely on TikTok food safety videos, WhatsApp groups, Facebook communities and informal advice shared via social media to learn about packaging, shelf life, hygiene and pricing. In focus groups, many producers described social media as their quick reference when seeking clarification. Digital microlearning is immediate, flexible and closely aligned with the realities of home-based work, filling critical gaps left by the absence of home specific SOPs and the limited frequency of formal training.

Awareness also spreads through market and community networks. Vendors and caterers significantly influence safety practices because producers supplying high volume outlets are encouraged or required to meet certain expectations. Vendors routinely instruct suppliers on labelling, storage, date marking, training requirements and batch control practices, creating a market-based education system in which producers adopt safety measures to maintain access to income opportunities. Producers, particularly women who make up the majority of home-based producers, also rely on peer networks for guidance, drawing on the experience of family members, neighbours or fellow small business owners. These micro communities facilitate the sharing of practical knowledge, enabling producers to develop workable interpretations of safety expectations.

Despite strong internal motivation, producers face practical challenges in translating awareness into consistent behaviour. Survey findings show that while producers report taking food safety

seriously even when busy, documentation practices are inconsistent, safety knowledge is not updated regularly, and structured safety planning is limited. These discrepancies highlight the limitations of awareness strategies when they are not supported by ongoing education and structured learning. Further, several producers misunderstood fundamental concepts such as the distinction between business registration under SSM and Ministry of Health certification, indicating persistent communication and awareness gaps.

Education and awareness efforts are also limited by several structural constraints. Producers managing childcare, household duties and microbusiness operations often struggle to attend training sessions. Financial barriers such as the cost of travel, training and equipment limit participation. MOH lacks formal tools to measure awareness or assess the effectiveness of communication campaigns, resulting in limited understanding of their impact. In parallel, the absence of tailored SOPs forces producers to rely on informal interpretations, increasing the risk of inconsistent practices.

The findings contribute several insights to the Malaysian governance context. Education is not merely a supplementary mechanism but the primary governance tool for home-based producers. Awareness spreads through digital and social pathways, often more effectively than through institutional channels. Market based and peer driven learning systems compensate for structural limitations in formal training. The need for a tailored curriculum that reflects domestic production realities is therefore urgent, ideally incorporating microlearning, interactive modules and SOPs specific to home based operations.

In summary, education and awareness strategies in Malaysia's homemade food sector are multifaceted, combining formal training, informal digital learning, community support systems and market-based expectations. Although producers demonstrate strong personal commitment to food safety, structural barriers and the absence of home-based SOPs limit the full translation of knowledge into practice. Strengthening education through hybrid learning models and

targeted awareness initiatives is essential for improving governance outcomes in this rapidly expanding informal sector.

6.2.7 Competence and Risk Management

Competence and risk management emerged as a complex and multifaceted theme because home-based producers operate outside regulated commercial environments and therefore rely heavily on their own knowledge, lived experience and moral judgement when preparing food. Unlike formal food producers who work within audited premises, structured SOPs and organisational supervision, homemade producers must interpret general guidance and translate it into routines that fit domestic constraints. This creates a governance landscape in which competence becomes self-generated and risk management depends on personal awareness, informal learning and culturally mediated responsibility. The findings align with broader literature noting that in informal food systems, competence is shaped not by regulatory control but through adaptive behaviours, self-reflection and socially embedded knowledge networks, as highlighted by Nyarugwe et al. (2018) and Maye and Kirwan (2013). Risk management in such environments emerges from a combination of cognitive, emotional and cultural influences rather than procedural compliance alone, echoing insights from food safety culture frameworks which emphasise the importance of personal responsibility and situational understanding in shaping safe practices (Powell et al., 2011; Yiannas, 2009).

Competence is acquired through several overlapping pathways beginning with compulsory food handler training but extending far beyond formal instruction. Officers described this training as essential for providing foundational knowledge of hygiene, contamination control and safe food handling, although producers noted that much of the content is oriented toward restaurant based or commercial kitchen environments that differ significantly from household spaces. This misalignment reflects broader observations that generalised training often fails to

support the complexities of informal production environments, as described by De Boeck et al. (2015). Producers explained that competence deteriorates when long gaps occur between production periods, especially among seasonal producers, supporting research suggesting that knowledge retention requires repeated practice and reinforcement (Reason, 1997). Alongside formal training, producers rely extensively on digital microlearning and peer-based education available through TikTok, WhatsApp and Facebook. These channels provide immediate, accessible learning tailored to real domestic challenges and mirror global findings that informal food workers often depend on social networks for practical guidance and risk interpretation (Spring and Pahnke, 2020). Digital communities therefore serve as important sources of competence by supplementing formal training with context specific information.

To support producers within this informal environment, Ministry of Health officers frequently engage in coaching and personalised guidance delivered through messaging applications, photo verification, product reviews and occasional home visits. Officers emphasised that these visits are intended to help rather than penalise producers, reflecting relational leadership principles described by Ashkanasy et al. (2000), who highlight the importance of supportive communication in low authority contexts. Coaching activities allow officers to explain requirements, demonstrate practices and clarify misunderstandings within the actual domestic environments where production occurs. This represents a form of situated learning, where knowledge is constructed through interaction and adapted to the realities of household kitchens, consistent with findings by Nyarugwe et al. (2016) regarding the value of contextualised training in informal food systems. In this way officers function as facilitators of competence rather than enforcers, reinforcing the idea that in domestic settings learning is most effective when guided through personalised and relationship-based communication, as discussed by Jespersen et al. (2017).

Producers consistently demonstrated strong awareness of the moral implications of unsafe food and often described a deep sense of responsibility toward their customers. Many expressed heightened caution when preparing food for vulnerable groups or for large events, suggesting that risk perception is shaped more by situational judgement than by technical frameworks. This emphasis on moral responsibility reflects research showing that in informal food systems risk management is often guided by personal ethics, cultural norms and emotional drivers rather than analytical hazard assessment (Hofstede, 2001; De Boeck et al., 2016). Producers showed clear understanding of immediate risks such as spoilage or contamination but had less confidence in more technical aspects of risk management such as pathogen growth parameters or allergen cross contact. This distinction between intuitive and technical risk knowledge mirrors findings that differentiate experiential understanding from scientific risk awareness (Powell et al., 2011). As a result, producers manage risk primarily through caution, a focus on reputation and strong ethical concern rather than through formal procedures.

Several factors constrain producers' ability to maintain consistent competence, beginning with the structural limitations of domestic kitchens which are shared with household activities and cannot be reorganised to meet commercial hygiene standards. Officers acknowledged that they cannot control household layouts, a limitation also highlighted in FAO's (2019) analysis of home-based food environments. Producers often struggled with documentation and record keeping, consistent with survey findings showing low scores for routine hygiene schedules and batch documentation. These gaps reflect research suggesting that administrative practices are frequently deprioritised in informal food work due to time constraints and their perceived limited relevance to daily production (WHO, 2020). The absence of home specific SOPs forces producers to interpret general guidelines themselves, increasing uncertainty and resulting in inconsistent risk management practices. Financial constraints, limited access to equipment and competing household responsibilities further impede efforts to implement recommended safety

behaviours. These barriers illustrate the structural difficulties inherent in expecting commercial level competence within informal domestic settings.

Enforcement limitations also shape how competence develops, as producers operate with minimal external oversight and instead depend on self-regulation, peer influence and market expectations. Vendors often require documentation and customers express safety expectations, prompting producers to take personal responsibility for maintaining standards. This reliance on intrinsic motivation and social accountability aligns with governance literature emphasising that informal food systems depend more on community norms and moral responsibility than institutional coercion (Maye and Kirwan, 2013). In the absence of audits or inspections, producers must internalise safety expectations and regulate their own behaviour, consistent with the concept of self-directed food safety culture described by Yiannas (2009). Competence therefore emerges not through formal supervision but through repeated interactions with customers, peers and commercial partners who reinforce expectations and shape risk perceptions.

Triangulating survey findings, interview data and focus group insights reveals a consistent pattern in which producers demonstrate strong commitment to food safety yet struggle with structural and procedural aspects of risk management. Survey data indicate high motivation but weaker performance in documentation and structured planning. Officer interviews highlight gaps in technical understanding and the need for ongoing coaching, while producer narratives reflect deep ethical concern and situational awareness but limited knowledge of formal risk frameworks. This pattern supports research suggesting that competence in informal systems is uneven because learning is fragmented and dependent on ad hoc experience rather than structured instruction (Nyarugwe et al., 2018). Risk management in such contexts is therefore substantial but inconsistent, driven more by moral responsibility than by standardised approaches.

This theme contributes important insights to Malaysian food safety governance by demonstrating that competence is shaped by behaviour, ethics and contextual adaptation rather than documentation or structural compliance. Risk management emerges from cultural expectations, personal responsibility and emotional investment in customer wellbeing. Digital microlearning and informal networks appear as major drivers of competence, offering flexible and context specific learning that remains unrecognised in formal policy frameworks. These findings highlight the importance of developing home based training modules and tailored SOPs reflecting domestic constraints, as well as hybrid educational strategies integrating formal, digital and relational learning modes. Such efforts are necessary to deepen understanding of how competence is developed and sustained in domestic production environments and to strengthen adaptive governance strategies within Malaysia's homemade food sector.

In summary, competence and risk management among Malaysia's homemade food producers reflect a dynamic interplay between personal ethics, adaptive learning and informal knowledge networks. Producers demonstrate strong intent and awareness, yet structural challenges, limited resources and fragmented guidance constrain consistent practice. Effective governance in this context requires education pathways that build upon existing moral commitment, incorporate digital learning and offer tailored support suited to domestic realities. Strengthening these competence building mechanisms will enhance safety outcomes and support the long-term development of an informed and resilient homemade food workforce.

6.3 Recommendations for the Enhancement of Food Safety Governance.

The improvement of food safety governance in Malaysia's home-based food sector requires a shift from fragmented regulatory expectations towards a more coherent, contextual and culturally embedded system that recognises the realities of informal and digitally mediated

food production. The study's findings demonstrate that homemade food producers, operating predominantly within domestic environments, negotiate risks through personal judgement, moral responsibility and peer-derived knowledge rather than formalised systems. This reflects broader cultural perspectives, where shared values, social norms and learned behaviours guide daily decision-making, consistent with the view that culture is transmitted through collective beliefs, practices and cognitive patterns that shape how individuals interpret their roles and responsibilities (Hofstede, 1991; Braff & Nelson, 2020; Coreil et al., 2001). In this context, enhancing governance requires the establishment of a system that resonates with these cultural underpinnings and supports a governance environment grounded in shared meanings, relational trust and adaptive learning.

A significant step toward strengthening governance is the creation of a unified national direction for home-based food safety. Research on organisational culture repeatedly shows that clear strategic orientation and visible leadership are essential for aligning expectations and influencing behaviour (Denison, 1997; Schein, 2010). When the system lacks cohesion, producers rely on subjective interpretation, resulting in varied and inconsistent practices. A structured national direction would allow federal and state entities to synchronise their efforts while enabling flexibility for local differences. Such alignment is crucial in decentralised systems, as the absence of shared principles often leads to divergent interpretations and administrative ambiguity, echoing findings in other sectors where inconsistent communication and unclear expectations reduce organisational cohesion and weaken safety outcomes (Mearns & Yule, 2009; Griffith et al., 2010b). A formalised and culturally sensitive national direction would therefore provide a stable foundation upon which home-based producers, officers and intermediaries can anchor their everyday practices.

Strengthening institutional coherence involves reducing the fragmentation observed between Malaysian federal and state-level implementation. The literature on organisational culture

emphasises that coherence emerges when institutions share not only structural frameworks but also consistent values, messages and behavioural norms (Martins & Terblanche, 2003; Van Den Berg & Wilderom, 2004). Fragmentation in food safety governance, as revealed in this study, often results from variations in officer judgement, resource constraints and differences in interpretation of guidelines. Such disparities mirror challenges identified internationally where complex regulatory systems struggle to translate national standards into consistent local practice (Varzakas et al., 2006; Ferretti, 2006). Strengthening governance therefore requires coordinated communication, shared operational principles and opportunities for cross-state dialogue. These mechanisms would support the emergence of a more unified safety climate, aligned with Zohar's (2011) observation that shared perceptions of safety-related expectations form the basis for consistent behavioural outcomes.

The integration of digital systems into governance processes is another essential improvement. The widespread reliance on digital channels among homemade food producers aligns with contemporary understandings of organisational communication, where effective message delivery depends not only on content but also on medium, credibility and frequency (Yiannas, 2009; De Boeck et al., 2015). Digitalisation should therefore be embraced not simply as a communication tool but as a governance infrastructure. International research highlights that communication channels whether visual cues, dialogue, messaging platforms or social media; shape how individuals interpret safety norms and perceive organisational commitment (Brown et al., 2019; Caccamo et al., 2018). Embedding governance functions in digital spaces would enable real-time clarification, rapid dissemination of risk information and ongoing microlearning, reflecting the dynamic and transient nature of safety climate, which changes in response to perceived environmental cues (Zohar, 2010). By aligning with producers' preferred behaviours and technologies, governance becomes more accessible, acceptable and impactful.

Partnership-based governance also emerges as an essential strategy for the home-based sector. The literature shows that complex food systems rely increasingly on networks of shared responsibility, where safety outcomes reflect the interplay between organisational control, peer influence, leadership behaviours and environmental pressures (Griffith et al., 2010b; Jespersen et al., 2017). Vendors, community groups and digital influencers already shape safety practices informally, mirroring global patterns where non-state actors assume regulatory roles in contexts where legal enforcement is limited (Manning & Soon, 2016). Recognising these actors formally within governance structures allows authorities to leverage existing social and market mechanisms. This form of multi-actor governance is consistent with network theories that highlight cooperation and mutual dependence as necessary features of effective oversight in decentralised systems (Rhodes, 1997). Partnering with vendors or community leaders also aligns with organisational behaviour theories that emphasise the power of social modelling, where individuals adopt practices demonstrated by peers whom they trust (Wright et al., 2012; Clayton & Griffith, 2008).

Supporting producers through a more contextual competency pathway is equally important. Competence in food safety is not solely a function of training but emerges through a combination of knowledge, culture, personal motivation, work environment and repeated behaviour (Wright & Leach, 2013; Hinz et al., 2007). Research shows that knowledge alone does not guarantee safe practice, particularly when the physical environment, time pressures or household responsibilities hinder implementation (Green et al., 2007; Motarjemi, 2014). In home-based settings, competence is shaped by moral responsibility, lived experience, familial norms and domestic constraints, consistent with the cultural perspectives outlined by Coreil et al. (2001) and Hofstede (2001). Strengthening governance therefore requires training that acknowledges household realities and supports producers in making context-appropriate safety decisions. A progressive competency pathway would mirror developmental models of food

safety culture that identify stages of maturity from awareness to full internalisation (Jespersen et al., 2016). Such an approach supports long-term behavioural change rooted in intrinsic motivation rather than compliance.

Improving traceability for home-based producers requires governance strategies that are light-touch and proportionate to the domestic context. Literature on food fraud, risk governance and safety assurance shows that traceability systems collapse when implemented without considering operational realities, leading to burden, non-compliance and data gaps (Manning & Soon, 2016; Spink & Moyer, 2011). For home-based enterprises with limited space, staff and resources, simple and flexible approaches such as minimal but meaningful record-keeping are more feasible and more likely to be adopted consistently. This aligns with findings that SMEs struggle with complex documentation and formal systems not because they resist safety but because structural conditions constrain their capacity to comply (Bas et al., 2007; Panisello & Quantick, 2001). A traceability approach that respects household constraints while enabling visibility supports regulatory responsiveness and enhances consumer protection without overwhelming micro-enterprises.

Finally, improving governance requires cultivating a culture of shared accountability that transcends formal rules and reflects the values and ethical responsibility of producers. The literature on safety culture emphasises that meaningful change arises not from enforcement alone but from shared beliefs, collective attitudes and internalised norms of responsible behaviour (Griffith et al., 2010b; Powell et al., 2011; Nyarugwe et al., 2016). Home-based producers demonstrated strong intrinsic motivation to protect consumers, consistent with broader evidence that safety behaviours are influenced by moral judgement and personal values (Arendt et al., 2015; Fatimah et al., 2014b). Governance improvements must therefore reinforce this sense of ethical responsibility by promoting recognition, transparent communication and positive reinforcement, reflecting research showing that appreciation and trust-based

communication strengthen adherence to safety practices (Taylor, 2011; Watson et al., 2018). A culture grounded in shared responsibility positions safety as a collective endeavour, aligning with perspectives that organisational culture is the product of shared assumptions that guide daily behaviour (Schein, 2004).

Strengthening food safety governance for Malaysia's home-based sector therefore requires an integrated system that acknowledges and leverages cultural norms, digital behaviour, partnership networks, contextual competence and intrinsic motivation. By aligning governance structures with the lived realities of domestic producers and the cultural dynamics shaping their decisions, Malaysia can develop a system that is not only operationally feasible but socially grounded, future-oriented and resilient.

6.4 Food Safety Governance Framework

Anchored in the seven (7) interrelated themes, this study presents a consolidated governance framework that contributes a systematic, context-appropriate model for enhancing food safety governance within Malaysia's expanding home-based food sector. (See table 6.1).

Table 6.1
Proposed Food Safety Governance Framework for Malaysia's Home-Based Food Sector

Strategic Governance Pillar	Core Aspects	Key Parameters
	Regulatory Vision & Direction	▪ Establish a National Home-Based Food Safety Blueprint (NHFSB). ▪ Align federal/state/district actions. ▪ Integrate home-based sector into national food safety strategy. ▪ Set long-term goals for safety, digital traceability, and community empowerment.
CONTROL, LEADERSHIP & GOVERNANCE	Governance Stewardship	▪ Implement education-first enforcement. ▪ Require officers to use supportive, empathetic styles. ▪ Ensure consistent interpretation of certification criteria. ▪ Develop cross-state governance manuals.
	Role Clarity & Coordination	▪ Define roles for FSQD, state/district health offices, vendors, platforms. ▪ Establish MOUs for information-sharing. ▪ Introduce shared governance dashboard. ▪ coordinate interagency meetings.
	Adaptive Oversight	▪ Customise oversight based on product risk and production volume. ▪ Enable flexible photo/video-based inspections. ▪ Promote problem-solving approaches. ▪ Offer progressive compliance pathways.

	Producer Visibility	▪ Create Malaysia Home-Based Food Registry (MHFR). ▪ Assign each producer a Unique Home-Food ID (HFID). ▪ Simplify onboarding; allow vendor referrals.
REGISTRATION & TRACEABILITY	Traceability Documentation	▪ Promote micro-logs (WhatsApp notes, photos). ▪ Encourage batch/date marking. ▪ Provide templates for small-batch documentation. ▪ Require HFID on online listings.
	Platform & Vendor Linkages	▪ Enable vendors to verify HFID via QR ▪ Encourage platforms to add voluntary safety tags. ▪ Link vendor supplier lists to MHFR for tracing. ▪ Confirm training/labelling compliance.
	Complaint-Based Identification	▪ Introduce WhatsApp hotline. ▪ Link complaints to MHFR. ▪ Create incident-tracking dashboard. ▪ Train officers in structured complaint response.
	Supportive Enforcement	▪ Use guidance-oriented visits. ▪ Offer personalised improvement plans. ▪ Adopt collaborative approaches during visits. ▪ Train officers in relational enforcement.
ENFORCEMENT & COMPLIANCE MECHANISMS	Risk-Based Monitoring	▪ Categorise producers by Low/Medium/High risk. ▪ prioritise high-risk foods (dairy, cream, sauces, sambal, kuih). ▪ Trigger visits based on documentation or complaints. ▪ Use digital monitoring tools.
	Point-of-Sale Checks	▪ Conduct checks at bazaars/events. ▪ Verify labels, temperature, packaging. ▪ Use POS monitoring for inaccessible home environments.

		▪ Provide on-the-spot coaching.
	Vendor-Driven Enforcement	▪ Formalise vendor requirements for certs/labels. ▪ Recommend vendor supplier lists; provide vendor checklists. ▪ Recognise safety-supportive vendors.
	Regulator–Industry Collaboration	▪ Partner with supermarkets, malls, bazaars, and delivery platforms. ▪ Co-develop seasonal safety campaigns; promote joint awareness drives.
CO-OPERATION & PARTNERSHIPS	Platform Partnerships	▪ Integrate MOH safety materials into TikTok/FB/IG algorithms. ▪ Co-create 'How to Sell Food Safely' mini-courses. ▪ Encourage platforms to highlight verified safe sellers.
	Interagency Synergy	▪ Collaborate with SME Corp, MARA, Women's Ministry. ▪ Embed food safety in entrepreneurship programs; target outreach to rural/B40 sectors.
	Community & Peer Support	▪ Form Home-Based Producer Clusters. ▪ Identify Food Safety Champions. ▪ Strengthen WhatsApp peer groups; promote community surveillance and shared learning.
	Multi-Channel Dissemination	▪ Distribute safety content via WhatsApp, TikTok, FB, IG. ▪ Provide bilingual materials. ▪ Produce visual SOP guides for low-literacy users.
	Clarity of Guidance	▪ Publish Home-Based Food Safety SOP Kit. ▪ Include steps for cooling, holding, allergen control, domestic storage. ▪ Use real household examples.

COMMUNICATION & SOP DISSEMINATION	Interactive Communication	▪ Enable voice-note Q&A. ▪ Offer voluntary kitchen walkthroughs via video. ▪ Create Ask-MOH hotline for instant support.
	Openness & Transparency	▪ Update guidelines regularly. ▪ Promote 'No Wrong Question' culture. ▪ Ensure consistent messaging across federal/state/district levels.
EDUCATION & AWARENESS STRATEGIES	Foundational Training	▪ Maintain food handler training & typhoid vaccination. ▪ Adapt modules for home kitchens; add high-risk food modules.
	Microlearning & Digital Education	▪ Create 1–2-minute microlearning videos. ▪ Produce Safe Raya Baking & Safe Ramadan Bazaar series. ▪ Use influencers for amplification.
	Continuous Learning	▪ Send festive-season hygiene reminders. ▪ Offer voluntary digital refresher courses. ▪ Provide personalised improvement notifications.
	Awareness Measurement	▪ Use digital quizzes for renewals. ▪ Track awareness via MHFR analytics. ▪ Identify low-awareness regions.
COMPETENCE & RISK MANAGEMENT	Practical Skill Development	▪ Provide workflow diagrams. ▪ Create safe storage charts. ▪ Teach safe handling for high-risk foods (cream, dairy, *sambal*, sauces).
	Risk Perception & Judgement	▪ Reinforce moral responsibility ('protecting family & customers'). ▪ Provide spoilage/contamination guides. ▪ teach rule: 'When in doubt, throw it out.'

	Behavioural Competence	▪ Promote realistic home routines (separate boards, safe thawing). ▪ Encourage consistency despite distractions. ▪ Provide printable daily checklists.
	Record-Keeping & Traceability	▪ Promote photo-based logs. ▪ Provide batch diary templates. ▪ Encourage screenshot storage of customer orders.
	Feedback-Driven Improvement	▪ Encourage using customer reviews for quality improvement. ▪ Promote peer-led kitchen walkthroughs. ▪ Recommend voluntary monthly self-checks.

The proposed framework functions as a practical governance guide that can be applied by food technologists in their everyday professional activities. It supports their work by offering a structured way to interpret cases, assess risk and provide consistent guidance across different situations, particularly in a sector where formal inspection is limited and domestic conditions vary widely. In daily use, technologists can draw on the framework to organise their decisions when reviewing applications, responding to enquiries or engaging with producers. It enables them to link key governance elements such as communication, traceability and competence into a coherent and proportionate approach, strengthening both the consistency and credibility of their guidance. Importantly, the framework represents an original contribution by operationalising food safety governance into a context-specific model that is directly applicable within informal domestic production settings.

For home-based food producers, the framework provides a clear and accessible structure that can be applied directly within their daily routines. It translates food safety expectations into practical actions that fit within household environments, enabling producers to make informed decisions during food preparation, storage and handling. In everyday use, the framework supports producers in recognising risks, organising their practices more systematically and maintaining awareness without relying on complex systems or formal documentation. It also reinforces a sense of personal responsibility by showing how individual practices contribute to overall safety outcomes. As a result, producers can apply the framework informally but consistently, strengthening their confidence, improving their practices and supporting gradual professionalisation within the home-based food sector.

6.5 Chapter Summary

This chapter integrated findings from the survey, interviews and focus groups to explain how food safety is governed within Malaysia's home-based food sector. The analysis shows that governance in this informal, digitally mediated context relies less on formal enforcement and more on relational practices, cultural norms and voluntary compliance, producing a dynamic but uneven system shaped by leadership, traceability, communication, education and producer competence. Situated within the existing literature, the findings informed practical and context-specific recommendations that recognise domestic production constraints while strengthening coordination, accountability and public health alignment. The final chapter revisits the research objectives, outlines limitations and identifies directions for future research.

CHAPTER SEVEN
CONCLUSION

7.1 Chapter Structure and Content

This concluding chapter synthesises the study's findings in relation to its overarching aim of examining food safety governance among online homemade food producers in Malaysia. It brings together evidence from the survey, interviews and focus group discussions, drawing on the Food Safety Governance Framework developed in Chapter 6. The chapter revisits the three research questions, followed by discussion of the study's theoretical and practical contributions, limitations and directions for future research. It concludes by highlighting the overall significance of the findings for strengthening food safety governance and informing policy and practice within Malaysia's evolving online homemade food sector.

7.2 Research Question (RQ) 1 – How Can Online Homemade Food Producers be Encouraged to Register their Business to Enable Food Regulatory Bodies to Trace Their Records or Details

The first research question examines the mechanisms, incentives and practical strategies that facilitate the registration and traceability of online homemade food producers in Malaysia. This question is fundamental because traceability forms an important component of food safety assurance, enabling authorities to identify producers, monitor risks and respond to food safety incidents. The importance of traceability within food safety management is well established, particularly in relation to the ability to maintain information across food production and supply networks (Yiannas, 2009; Manning, 2017).

Triangulated findings from the survey, interviews and focus groups demonstrate that although registration is not mandatory under existing Malaysian law, multiple structural, behavioural and market-based factors influence producers' visibility within the governance system.

A central finding arising from interviews with food technologists is that online homemade food producers are not legally required to register with the MOH. Registration under the Ministry remains voluntary and occurs only when producers apply for the Home-Based Certification Scheme, which focuses exclusively on food safety compliance rather than business legitimacy. Officers clarified that business registration falls under the Companies Commission of Malaysia and therefore MOH registration cannot be equated with a licensing system. As a result, two distinct groups of producers emerge, namely those who voluntarily obtain Ministry certification and those who remain entirely outside any formal oversight framework. The voluntary nature of registration creates uneven visibility, whereby certified producers become traceable through documented records, while others remain accessible only through external triggers such as vendor networks, complaint reports or food poisoning investigations. This pattern is consistent with wider observations concerning informal food systems, in which governance responsibilities and risk management may be distributed across formal and informal actors rather than being controlled solely through statutory mechanisms (Maye and Kirwan, 2013; Manning and Soon, 2016). Interviews further revealed that some producers apply for certification once and subsequently become inactive, often due to seasonal operations, employment changes or financial constraints, resulting in certification records that fluctuate over time and complicate traceability efforts. Such variability also reflects broader challenges associated

with voluntary regulatory arrangements, where participation and continued engagement may be uneven (Hutter, 2011; Rothstein et al., 2013).

The data consistently show that traceability is weakest among producers operating informally, particularly those who sell exclusively through social media platforms. Because platforms such as Facebook, Instagram, TikTok and WhatsApp do not require food-related verification, many producers remain unregistered and invisible to authorities unless their products enter formal retail channels or become associated with an incident or complaint. This finding reflects wider concerns regarding the regulatory visibility of informal and digitally mediated food activity, where commercial activity can occur outside conventional monitoring arrangements (FAO, 2019; Spring and Pahnke, 2020). Food technologists reported that unregistered producers typically become identifiable only when they begin supplying established caterers or vendors, who in turn verify suppliers' documentation. Focus group discussions reinforced this concern, with officers noting that traceability depends heavily on supply chain visibility, meaning that producers supplying large events, food courts or commercial vendors are far more likely to be traced than those selling directly to consumers online. The importance of supply-chain relationships in extending food safety oversight beyond individual organisations is also recognised within the food safety governance literature (Manning, 2017). This reactive detection model, in which producers become visible mainly after problems emerge, limits the Ministry's ability to prevent food safety risks proactively and reflects the challenges associated with monitoring dispersed and informal activities through conventional regulatory approaches (Hutter, 2011).

Despite these structural limitations, the study found that market actors play a crucial role in promoting registration and traceability. Vendors, supermarkets and event caterers frequently impose their own requirements on suppliers, including proof of food handler training, typhoid vaccination and appropriate labelling. These informal procurement standards create a strong incentive for homemade food producers to obtain Ministry certification, as certification enhances credibility and expands market access. Food technologists described how supermarkets and larger vendors often require certification as a condition of supply, an approach intentionally encouraged by the Ministry through partnership-based engagement strategies. This vendor-driven mechanism effectively extends the Ministry's reach by embedding food safety expectations within commercial transactions and reduces reliance on statutory enforcement while increasing producer motivation to register, particularly among those seeking business expansion. The role of commercial actors in establishing and transmitting food safety expectations is consistent with research that recognises food safety governance as extending across wider supply networks rather than remaining solely within the boundaries of individual organisations (Abbott, 2012; Manning, 2018; Jespersen et al., 2017). In this respect, vendors and other intermediaries can function as important governance nodes by requiring evidence of compliance from upstream suppliers.

Another factor influencing registration relates to awareness of the certification scheme itself. Findings from interviews and focus groups highlighted the Ministry's ongoing engagement efforts through talks, briefings, television promotions, pamphlets and cross-agency collaborations aimed at raising awareness of food safety obligations and certification benefits. Although officers acknowledged that no formal baseline

measurement exists, anecdotal evidence suggests that awareness is improving, particularly among newer and more educated producers entering the online market. Survey findings support this observation indirectly, as producers with more than five (5) years of operational experience recorded significantly higher governance indicator scores than newer entrants, suggesting that prolonged exposure to food safety messaging contributes to stronger compliance behaviours, including registration-related practices. The importance of communication, learning and repeated exposure to food safety expectations is consistent with food safety culture literature, which emphasises the role of communication and learning in shaping safety-related behaviours (Yiannas, 2009; Jespersen et al., 2017).

An additional enabling factor concerns the supportive nature of the Ministry's verification process. Interviews and focus groups indicated that producers applying for certification are required to submit photographs and simple sketches of their kitchen layout, which Food Technologists assess on a case-by-case basis, with home visits conducted only when necessary. Food Technologists also emphasised that these visits are educational rather than punitive, thereby reducing fear or resistance among applicants. This non-intrusive and guidance-oriented approach contributes to trust building between regulators and producers and makes the registration process more approachable. The emphasis on guidance, communication and relational engagement is consistent with previous research suggesting that food safety behaviour is influenced not only by formal systems but also by leadership, communication and the social context in which safety expectations are interpreted (Jespersen et al., 2017; Griffith et al., 2010; Schein, 2010). Producers participating in focus group discussions expressed appreciation for this supportive engagement, noting that home

visits often provided practical advice that enhanced their confidence in managing food safety. Such positive experiences may further encourage producers to register and maintain certification.

In summary, the discussion of this research question shows that registration and traceability among online homemade food producers in Malaysia are shaped by a combination of structural, behavioural and market-based factors rather than formal legal requirements. While the voluntary certification system limits the Ministry's capacity to comprehensively identify all producers, registration is encouraged through vendor-driven procurement standards, awareness and communication efforts, supportive non-punitive verification practices and producers' intrinsic desire to appear credible to customers and intermediaries. These findings are consistent with broader scholarship suggesting that food safety governance in informal settings may depend upon combinations of voluntary participation, relational engagement and distributed responsibility rather than conventional command-and-control regulation alone (Maye and Kirwan, 2013; Manning and Soon, 2016). Nonetheless, significant traceability gaps persist, particularly among producers operating solely through social media and outside formal market channels. These findings highlight the need for enhanced governance models, including digital platform partnerships, simplified registration mechanisms and context-specific traceability tools, which are considered further in the following sections.

7.3 Research Question (RQ) 2 – How are Food Preparation Processes Undertaken and How are Safety Standards Addresses by Online Homemade Food Producers in Malaysia

Research Question 2 focuses on understanding how online homemade food producers in Malaysia carry out their food preparation activities and the extent to which food safety standards are interpreted, practised and internalised within domestic production environments. The triangulated findings demonstrate that although many homemade food producers show genuine commitment to safe practice, the processes they adopt are shaped by the structural limitations of domestic kitchens, differing levels of knowledge, market pressures and the absence of home-specific regulatory standards. These findings are consistent with previous research suggesting that food safety competence and behaviour are shaped not only by formal knowledge but also by organisational, environmental and contextual factors (Wright et al., 2012; Jespersen et al., 2016; Nyarugwe et al., 2016).

Across interviews and focus groups, food technologists consistently emphasised that food preparation among homemade producers occurs in private residential kitchens, which vary widely in layout, size, hygiene conditions and available infrastructure. Because these kitchens are not recognised as formal food premises under Malaysian food law, Ministry of Health officers do not have the legal authority to impose structural requirements, mandate layout modifications or enforce commercial-grade hygiene facilities. Officers described domestic kitchens as inherently heterogeneous, ranging from urban flats to village houses, which creates practical challenges for standardising preparation practices. The structural constraints associated with domestic food production are similarly recognised in the literature, which highlights the difficulty of applying conventional food

safety management approaches to household environments that were not designed as commercial food premises (FAO, 2019). Despite these differences, officers reported that many producers demonstrate intrinsic responsibility in managing their food preparation processes, particularly in the handling of raw materials, maintenance of cleanliness and control of environmental conditions during production. Several technologists highlighted that producers who understand the basic principles of hygiene, raw material handling, process flow and safe serving are more likely to achieve consistent quality and safety outcomes.

Producers' narratives from the focus group discussions reinforced this observation. Many described detailed routines to ensure freshness, avoid cross-contamination and manage product shelf life, particularly when supplying vulnerable groups, school events or large gatherings. Producers expressed heightened caution due to the reputational and moral consequences of unsafe food, often stating that they prepared food as if serving their own families. This emphasis on personal responsibility is consistent with food safety culture literature, which distinguishes safe behaviour from simple knowledge of procedures and emphasises the influence of values, beliefs, attitudes and shared expectations on food safety practices (Yiannas, 2009; Griffith et al., 2010a; De Boeck et al., 2016). However, the study also revealed that not all producers apply these processes consistently, particularly those operating seasonally or intermittently. Knowledge gaps, inconsistent routines and limited ongoing practice contribute to variability in preparation standards, an issue acknowledged by both technologists and producers themselves.

Further survey findings indicate that producers perceive food safety as their responsibility, as reflected in high mean scores for maintaining food safety under pressure and recognising its importance in building customer trust. In contrast, adherence to more structured safety practices, such as systematic documentation, work planning and consistent record keeping, was noticeably weaker. Survey items related to timely responses to safety issues or scheduled cleaning routines recorded among the lowest mean values, indicating procedural gaps in safety management. This distinction between attitudes and actual practices is important because food safety culture research indicates that positive attitudes or knowledge alone do not necessarily guarantee consistent food safety behaviour (De Boeck et al., 2016, 2017; Griffith et al., 2010b). The present findings therefore suggest that producers' commitment to food safety does not always translate into equally systematic procedural practices.

Food handler training emerged as the primary mechanism through which producers acquire knowledge of food safety standards. Most technologists emphasised that training is compulsory under Malaysian law and provides foundational understanding of hygiene and contamination control. However, training is currently required only once, leading to knowledge decay over time, particularly among producers who do not practise regularly. Officers confirmed that many producers forget essential principles after extended periods, prompting discussions within the Ministry about implementing mandatory retraining every five years. The importance of continued learning is consistent with food safety culture research, which emphasises that food safety competence involves more than the acquisition of knowledge and requires reinforcement through communication, learning and repeated practice (Jespersen et al., 2016; Nyarugwe et al., 2018). Despite these limitations,

producers who had completed training recorded higher governance scores and stronger safety practices in the survey, demonstrating the role of training in establishing baseline competence.

A distinctive feature of Malaysia's governance approach is the supportive and educational nature of on-site engagement for producers applying for certification. When documentation appears unclear or when risk indicators are present, officers conduct kitchen visits to provide practical guidance rather than imposing punitive measures. Producers described these visits as highly beneficial, offering practical advice related to layout, glove use, storage conditions and workflow improvements. This personalised coaching supports producers in interpreting general guidelines in ways that fit domestic constraints, helping bridge the gap between formal safety standards and home-based production realities. Such an approach is consistent with previous research emphasising the importance of communication, coaching and supportive engagement in developing food safety culture and translating formal expectations into everyday practice (Griffith et al., 2010; Jespersen et al., 2017).

Despite these supportive mechanisms, significant challenges remain in applying food safety standards within domestic contexts. Malaysian food regulations provide comprehensive requirements for labelling, hygiene and handling, yet no dedicated standard operating procedures exist specifically for home-based producers. Food technologists explained that existing guidelines must be adapted by producers to suit household environments, which differ considerably from formal food premises. This absence of home-specific guidance creates interpretation gaps, with producers often unsure which aspects of formal standards apply to their kitchens. The need to contextualise food safety

systems according to the characteristics of the production environment is recognised in the literature, which cautions against assuming that standardised management approaches can be applied uniformly across different operational contexts (Hutter, 2011; Wright & Leach, 2013). Misunderstandings also occur when producers confuse Ministry certification with business registration under the Companies Commission of Malaysia, indicating broader conceptual ambiguity around regulatory expectations. Unequal access to training further exacerbates these issues, particularly for rural producers who face geographic and logistical barriers. In addition, many producers rely on informal learning through social media, peers and online videos, where information quality varies. The importance of informal and peer-based learning in food safety practice has also been identified in previous research, particularly in settings where formal learning opportunities are limited (Maye and Kirwan, 2013; Nyarugwe et al., 2018).

These conditions contribute to inconsistent implementation of safety standards, especially among producers with limited resources or those operating on a casual basis. At the same time, the study highlights the increasing role of intermediaries in reinforcing safety practices. Vendors, supermarkets and caterers frequently require documentation such as training certificates, vaccination records and compliant labelling before accepting products. This creates strong incentives for producers to align with safety expectations even in the absence of legal enforcement. Producers acknowledged that failure to meet vendor requirements often results in product rejection, which in turn shapes their adherence to safety standards. The role of such market actors is consistent with the broader concept of distributed food safety governance, in which responsibility for managing food safety is shared across organisations and supply-chain actors rather than being located exclusively

within formal regulatory authorities (Manning and Soon, 2016; Manning, 2018; Jespersen et al., 2017).

Broadly, the findings indicate that food preparation processes among online homemade food producers are grounded in moral responsibility, practical experience and selective application of safety knowledge, yet are constrained by the structural realities of private households and the absence of home-specific regulatory guidance. Producers demonstrate commitment to safe practices, particularly when preparing food for community events or supplying intermediaries, while procedural consistency, documentation and risk-based decision making remain weaker areas. Safety standards are therefore addressed through a combination of foundational training and informal learning, supportive coaching provided by the Ministry during certification, vendor-driven safety expectations and producers' own moral and cultural sense of accountability. This combination reflects the broader understanding of food safety culture as an interaction between individual values and behaviours and the wider organisational, social and environmental conditions in which food is produced (Yiannas, 2009; Nyarugwe et al., 2016). At the same time, inconsistent knowledge retention, lack of tailored guidelines and variability in domestic conditions continue to challenge the systematic application of food safety standards. These insights provide a foundation for Research Question 3, which examines strategies and policies needed to strengthen and institutionalise safe practices across the homemade food sector.

7.4 Research Question (RQ) 3 – How Can Detailed SOPs and Guidelines be Imposed for Online Homemade Food Producers in Malaysia

The third research question addresses one of the most significant governance challenges identified in this study, namely the development and imposition of detailed, practical and

context-appropriate standard operating procedures for online homemade food producers in Malaysia. Unlike formal food premises, home-based operations exist outside the structural and legal boundaries traditionally used to regulate food safety. This creates a unique policy environment in which statutory enforcement is limited, voluntary compliance is central and governance must be adapted to domestic realities. Findings from the survey, interviews and focus groups demonstrate that effective SOP imposition requires a combination of soft governance tools, market-based mechanisms, communication strategies and culturally sensitive regulatory approaches. This reflects broader scholarship suggesting that voluntary and network-based governance mechanisms can become important where conventional command-and-control approaches are difficult to apply, particularly in complex and decentralised food systems (Hutter, 2011; Manning and Soon, 2016).

Interviews with food technologists revealed that Malaysia currently lacks SOPs specifically tailored to home-based food production. Existing guidelines, including general safe food preparation guidance and labelling requirements under the Food Act 1983 and its Regulations, were not designed for domestic settings and therefore cannot be applied uniformly across diverse household environments. Officers emphasised that the MOH cannot legally mandate structural modifications in private homes, as domestic kitchens are not classified as food premises. This structural constraint significantly limits the Ministry's capacity to impose detailed SOPs through conventional regulatory mechanisms. Food technologists further explained that home-based kitchens vary extensively, ranging from apartments to kampung houses, making it impractical to apply uniform structural standards. The need to account for the distinctive physical and operational characteristics of home-based food production is also reflected in the literature, which identifies the

underdeveloped regulatory framework governing food safety in Malaysia's home-based sector (Hamat et al., 2019; FAO, 2019). Focus group discussions reinforced this view, with officers noting that entering homes without cause would be culturally inappropriate and potentially unsafe, thereby necessitating governance strategies that respect household privacy while still safeguarding public health.

Given these constraints, the imposition of SOPs relies primarily on soft governance mechanisms, particularly the Home-Based Certification Scheme, which promotes voluntary compliance rather than mandatory enforcement. Certification requires producers to meet minimum safety requirements such as food handler training, typhoid vaccination and appropriate labelling. Although participation in the scheme is optional, it functions as a key avenue through which expectations are communicated, and SOP adoption is encouraged. Ministry officers deliberately frame certification as supportive rather than punitive, using the application process as an opportunity to guide producers in understanding and applying safety standards. Producers are required to submit photographs and simple sketches of their kitchen layout, allowing officers to assess conditions indirectly. Where documentation indicates potential concerns, home visits are conducted not for enforcement purposes but to provide hands-on coaching, which participants described as highly beneficial in supporting the implementation of safe practices. These educational visits therefore act as informal mechanisms through which SOPs are effectively imposed in a manner tailored to each household context. This approach is consistent with research on voluntary and relational forms of regulation, in which compliance may be supported through guidance, trust and cooperative engagement rather than formal sanctions alone (Hutter, 2011; Rothstein et al., 2013).

Across the findings presented in Sections 5.3 and 5.4, communication emerged as the backbone of SOP dissemination and implementation. Because domestic spaces cannot be inspected routinely, officers rely heavily on mediated communication methods such as photo verification, WhatsApp messaging, document review and explanatory discussions during the certification process. These communication practices enable producers to interpret general guidelines and translate them into practical actions appropriate for their home environments. Food technologists noted that while a general Safe Food Preparation at Home guideline exists and is shared with applicants, it remains broad and non-prescriptive. As a result, officers prioritise clarity, guidance and interpretive support through direct communication to bridge the gap between formal standards and domestic practice. The importance of communication in shaping how food safety expectations are interpreted and enacted is well established within food safety culture research (Yiannas, 2009; De Boeck et al., 2015; Jespersen et al., 2017). In the absence of home-specific SOPs, this interpretive engagement becomes essential. Nevertheless, both officers and producers acknowledged persistent awareness and communication gaps, including confusion between MOH certification and business registration under the Companies Commission of Malaysia (SSM), difficulties applying general SOPs in household kitchens and inconsistent absorption of information among seasonal producers. These challenges highlight the need for more structured, accessible and context-sensitive SOP dissemination mechanisms.

One of the most important insights arising from the study is the emergence of market-driven SOP enforcement through vendors, caterers and supermarkets. These intermediaries frequently impose their own requirements, such as food handler training certificates, vaccination records and compliant labelling, before accepting products from home-based

suppliers. Producers must meet these expectations in order to access commercial opportunities, which effectively incentivises alignment with safety standards, including implicit SOP requirements. Focus group participants noted that vendors often reject products that fail to meet basic requirements, indirectly reinforcing consistent safety practices. Ministry officers further described deliberate engagement with supermarkets to formalise such expectations, thereby embedding SOP requirements more firmly within supply-chain relationships. Through this mechanism, SOPs are imposed through commercial interactions, circumventing the limitations of statutory enforcement within private homes. This form of vendor-mediated oversight is consistent with supply-chain governance literature, which recognises that commercial actors can function as regulatory intermediaries by imposing safety requirements on upstream suppliers (Abbott, 2012; Manning, 2018). It also supports Jespersen et al.'s (2017) view that food safety culture can be shaped through interactions across wider supply networks rather than solely within individual organisations.

Although the present role of digital platforms such as Facebook, Instagram, TikTok and WhatsApp remains largely limited to marketing activities, the findings strongly suggest that platform-based governance mechanisms could support SOP imposition. At present, platforms do not require food safety verification, contributing to traceability and compliance gaps. However, focus group discussions indicated that digital platforms are highly influential spaces for learning, peer interaction and informal knowledge exchange. This role of digital platforms is consistent with previous work identifying social media and online communities as important informal learning environments for small-scale producers (Spring and Pahnke, 2020; Nyarugwe et al., 2018). At the same time, the capacity of digital

platforms to shape and mediate everyday activity provides a basis for considering their potential governance role (Gillespie, 2018). This suggests that formal collaboration between the MOH and digital platforms could strengthen SOP uptake. The analysis in Chapter 6 proposes platform-based safety tags, verification features and integrated guidance modules as potential mechanisms for embedding SOP expectations directly into digital marketplaces. These interventions could improve visibility, encourage voluntary compliance and reinforce the importance of food safety standards.

Education and awareness emerged as central pillars supporting SOP implementation. Survey findings showed that while producers express strong commitment to food safety, systematic planning and documentation practices remain limited. Interviews and focus group discussions further highlighted the importance of continuous education, particularly as knowledge acquired through food handler training deteriorates over time, especially among seasonal producers. Officers described ongoing policy discussions within the Ministry regarding the introduction of mandatory retraining every five years, a measure that would substantially strengthen SOP compliance if implemented. Awareness initiatives must also extend beyond information provision to reinforce behavioural change. Producers reported constraints related to time, finances and domestic responsibilities, underscoring the importance of targeted support that reflects their lived realities. The literature similarly suggests that food safety competence is not simply a function of training, but develops through the interaction of knowledge, motivation, environmental conditions and repeated behaviour (Wright and Leach, 2013; Hinz et al., 2007). This supports the proposal advanced in Chapter 8 for micro-learning modules, digital reminders and visual SOP tools that better align with the working patterns of home-based producers.

In essence, the findings demonstrate that imposing detailed SOPs for online homemade food producers requires a hybrid governance approach that combines voluntary certification supported by educational engagement, communication-driven SOP dissemination, vendor-mediated enforcement through supply chains, potential partnerships with digital platforms, continuous training and awareness reinforcement and context-sensitive SOP tools that recognise domestic diversity. Given the legal and structural constraints of domestic food environments, SOP imposition cannot rely on traditional enforcement mechanisms. Instead, Malaysia's governance system must leverage soft governance, market incentives and distributed responsibility, supported by clear, accessible and context-specific guidance. This interpretation is consistent with the wider governance literature and with the study's own evidence that partnerships among regulators, vendors, producers and digital communities can compensate, at least partially, for limitations in formal enforcement and physical inspection (Manning and Soon, 2016; Manning, 2018; Jespersen et al., 2017). These findings provide the empirical foundation for the governance framework proposed earlier and feed directly into the theoretical and practical implications discussed in the following section.

7.5 Contribution of the Study

This study contributes to knowledge and practice by providing an empirically grounded account of food safety governance among online homemade food producers in Malaysia. As an exploratory mixed-methods investigation of food production undertaken within private domestic environments and mediated through digital platforms, the study addresses an under-examined governance context in which conventional regulatory mechanisms

have limited reach. The contributions arise from the integration of survey, interview and focus group findings and are expressed through the Food Safety Governance Framework developed in Chapter 6, together with the empirical and practical insights generated across the three research questions. The contributions are presented in terms of their theoretical and practical significance.

7.5.1 Theoretical Contribution

The principal theoretical contribution of this study is the development of a Food Safety Governance Framework for online homemade food production in Malaysia. The framework integrates seven (7) interconnected domains; control and leadership, registration and traceability, enforcement and compliance, cooperation and partnerships, communication and SOP dissemination, education and awareness, and competence and risk management. These domains were derived from the empirical findings across the three research questions and provide an integrated representation of the mechanisms through which food safety is governed within a domestic and digitally mediated food environment. The framework therefore represents a synthesis developed from the present study rather than a direct application of an existing formal food-premises model.

The framework extends existing food safety governance thinking by demonstrating that governance within the online homemade food sector cannot be understood solely through statutory regulation, inspection and enforcement. Existing food safety research has increasingly recognised the importance of behavioural, organisational, environmental and governance conditions in shaping food safety practices (Griffith et al., 2010; Jespersen et al., 2016; Nyarugwe et al., 2020). The present study extends this perspective to a setting in

which food is prepared within private homes, sold through digital channels and subject to limited direct regulatory oversight. The findings demonstrate that responsibility for food safety is distributed across regulatory authorities, producers and market intermediaries, while digital platforms represent an emerging environment through which information, visibility and potential governance mechanisms may operate.

A further theoretical contribution is the conceptualisation of domestic food safety governance as context-dependent. The findings demonstrate that food safety requirements developed for conventional food premises cannot simply be transferred to domestic kitchens without interpretation and adaptation. Differences in household space, infrastructure, resources, production patterns and producer circumstances influence how safety requirements are understood and implemented. This extends food safety culture perspectives by highlighting the interaction between individual commitment and the environmental and contextual conditions in which food is produced. Previous research has similarly emphasised that food safety behaviour is shaped by interacting with individual, organisational and environmental factors rather than knowledge alone (Griffith et al., 2010; Jespersen et al., 2016; Nyarugwe et al., 2020).

The study also contributes to understanding the relationship between formal regulation and informal or relational governance. The findings show that where statutory regulatory reach is constrained, food safety expectations are reinforced through voluntary certification, supportive regulatory engagement, vendor requirements, peer learning and communication. Governance therefore operates through multiple interacting actors rather than exclusively through the regulatory authority. In particular, vendors, caterers and supermarkets can reinforce food safety requirements through their procurement practices,

while producers themselves exercise an important degree of self-regulation. The contribution lies in demonstrating how these mechanisms interact within a domestic food production environment where conventional regulatory enforcement is difficult to apply. A further contribution concerns the role of digital platforms within emerging food governance arrangements. The study found that platforms such as Facebook, Instagram, TikTok and WhatsApp currently facilitate marketing, producer-consumer interaction and informal learning but do not routinely verify food safety compliance. This creates a distinctive governance gap: producers may be highly visible to consumers while remaining insufficiently visible to regulatory authorities. The study therefore extends discussion of platform-mediated food economies by identifying digital platforms as potential partners in future traceability, information dissemination and voluntary verification mechanisms, while recognising that such roles would require further policy development and evaluation. The study additionally contributes to food safety culture scholarship by highlighting the importance of moral responsibility, social norms and supportive regulatory relationships within domestic production. Producers frequently expressed concern about causing harm to customers and described food preparation in terms of responsibility towards others. At the same time, food technologists described an educational and non-punitive approach to engagement with producers. These findings suggest that food safety behaviour in domestic settings is influenced not only by formal rules but also by personal values, social expectations, trust and the nature of regulatory interactions. This complements existing food safety culture perspectives that emphasise the interaction between values, behaviour, communication and the wider environment in which food safety practices occur (Yiannas, 2009; Griffith et al., 2010; De Boeck et al., 2016).

Finally, the study contributes an empirical perspective from Malaysia, where research on the governance of online homemade food production remains limited. By integrating evidence from producers and food technologists and examining registration, preparation practices and governance mechanisms across the three research questions, the study provides a detailed account of how food safety governance operates within an emerging digital and informal food economy. The Malaysian case also provides a basis for future comparative research examining whether similar governance challenges and mechanisms arise in other jurisdictions where domestic food entrepreneurship and digital food markets are expanding. The framework should therefore be understood as a contextually grounded conceptual contribution that requires further empirical testing beyond Malaysia.

7.5.2 Practical Contribution

The practical contribution of this study lies in identifying governance mechanisms that can strengthen food safety oversight while recognising the legal, structural and operational realities of domestic food production.

For the Ministry of Health and other food regulatory authorities, the findings identify the need to improve producer visibility through a simplified and accessible registration or registry mechanism and to strengthen traceability through proportionate, risk-based approaches. The findings also indicate the potential value of linking regulatory communication and traceability mechanisms with digital environments in which producers already operate. These measures could enable more systematic identification of producers and support more targeted regulatory engagement, while recognising that implementation would require appropriate legal, technical and privacy considerations.

The study also provides empirical support for maintaining and strengthening an education- and guidance-oriented regulatory approach. Producers generally perceived supportive engagement and kitchen visits as useful because officers provided practical advice rather than relying solely on punitive measures. This suggests that regulatory implementation could benefit from consistent guidance-oriented approaches, appropriate officer training and communication resources designed specifically for home-based producers. The evidence of knowledge deterioration among producers who operate intermittently also highlights the potential value of periodic refresher training. The proposed five-year retraining requirement identified by participants should, however, be regarded as a policy option arising from the findings rather than as an empirically established optimal interval.

For food technologists and regulatory officers, the study provides evidence of the practical difficulties experienced by producers in interpreting general food safety requirements within domestic kitchens. The findings support the use of accessible communication tools, including photographs, messaging applications and document-based guidance, as complementary mechanisms for engagement where routine physical inspection is inappropriate or impractical. They also highlight the importance of consistent interpretation of requirements across jurisdictions and of communication that reflects differences in producers' resources, experience and operating circumstances.

For online homemade food producers, the study identifies the areas in which practical support is most relevant, including food handler competence, raw material handling, labelling, storage, kitchen organisation, documentation and risk awareness. The findings also clarify the distinction between food safety certification and business registration and

demonstrate how certification and compliance can influence access to vendors and other commercial opportunities. This provides a basis for developing clearer guidance and practical tools that help producers translate general regulatory requirements into actions suitable for domestic kitchens.

For vendors, caterers and supermarkets, the study demonstrates that commercial procurement requirements can function as complementary mechanisms for reinforcing food safety expectations. Requirements relating to training, vaccination and labelling already influence whether some homemade products are accepted. Greater coordination between regulatory authorities and market intermediaries could therefore strengthen food safety governance, provided that commercial requirements remain consistent with public regulatory objectives and do not create unnecessary barriers for small-scale producers.

For digital platforms, the study identifies potential opportunities for future collaboration with food regulatory authorities. Possible mechanisms include food safety information, voluntary verification, producer guidance, reporting pathways and traceability-supporting features. These possibilities are proposed as areas for further development rather than as established regulatory solutions, and their implementation would require consideration of platform responsibilities, privacy, technical feasibility, accountability and the potential exclusion of small-scale producers.

The practical contribution of the study is the identification of a coordinated set of mechanisms through which Malaysia can strengthen the governance of online homemade food production without relying exclusively on conventional inspection and enforcement. The findings support an approach combining improved producer visibility, context-specific SOPs and guidance, supportive regulatory engagement, periodic competency development,

market-based requirements and carefully designed digital collaboration. The contribution therefore lies in translating the empirical findings into practical governance options that are proportionate to the distinctive characteristics of domestic and digitally mediated food production.

7.6 Limitations of the Study

Like all empirical research, this study is subject to methodological, contextual and structural limitations that should be considered when interpreting its findings. These limitations define the boundaries within which the findings and conclusions should be understood and provide a basis for identifying directions for further research.

The first limitation concerns the absence of a national sampling frame for online homemade food producers in Malaysia. Because the population of active producers could not be established with precision, the quantitative phase relied on non-probability recruitment through online channels, including WhatsApp and social media platforms. Although producers from all Malaysian states participated, the sample cannot be regarded as statistically representative of the national population. The absence of formal registration for many producers also makes it difficult to determine the size and characteristics of the underlying population. Consequently, self-selection and non-response bias cannot be excluded. Producers who were more visible online, more established or more interested in food safety may have been more willing to participate, while those operating entirely informally may have been less accessible. Uneven participation across states further limits geographical generalisability. The final quantitative dataset comprised 105 usable responses from the 120 questionnaires returned.

A second limitation concerns the self-reported nature of the quantitative data. The survey measured producers' reported perceptions, attitudes and practices rather than their food preparation behaviour through direct observation. Food safety is a sensitive subject, and respondents may have provided socially desirable responses when reporting hygiene practices, compliance and personal responsibility. Accordingly, the survey findings should be interpreted as evidence of reported practices and perceptions rather than direct verification of actual food-handling behaviour.

The qualitative phase also has limitations. Interviews involved 14 Food Technologist Officers representing all 14 Malaysian states, providing broad geographical and institutional coverage. However, individual accounts may reflect particular operational, organisational or resource conditions and cannot represent every regulatory experience within each state. The qualitative findings therefore provide in-depth institutional perspectives rather than statistically generalisable evidence. The focus groups were also purposively selected and intended to generate contextual understanding rather than statistical representation. Participants may have emphasised particular experiences or adjusted their responses according to perceived expectations. Food technologists may have placed greater emphasis on supportive regulatory practices, while producers may have presented their food safety practices favourably. Although triangulation across the survey, interviews and focus groups strengthened interpretation, it could not completely eliminate these potential sources of response bias.

A further limitation arises from the absence of comprehensive home-specific SOPs for online homemade food production. The study therefore examined how producers and food technologists interpret and apply existing food safety requirements within domestic

environments rather than assessing compliance against a dedicated home-based regulatory standard. The findings should consequently be understood primarily as evidence concerning governance processes, interpretations and practices rather than as a formal compliance audit against a home-specific benchmark.

The study was also constrained by the difficulty of accessing producers operating at the most informal end of the sector. Producers who operate exclusively through personal social-media accounts, have no certification, maintain limited records or operate intermittently may be particularly difficult to identify and recruit. The study may therefore disproportionately reflect producers who are more visible, digitally accessible, established or willing to participate in research. This limitation is particularly relevant to findings concerning registration, traceability and compliance because the producers least visible to regulators may also be least visible to researchers.

Finally, systematic direct observation of domestic food preparation environments was limited. Home-based production occurs within private kitchens that vary considerably in size, layout, infrastructure and household circumstances. Consequently, the study could not independently verify all reported food-handling practices or kitchen conditions through repeated observation. The findings therefore rely on the convergence of survey responses, regulatory interviews and focus group accounts rather than systematic observational assessment.

Taken together, these limitations mean that the findings should be interpreted as contextually grounded evidence of food safety governance within Malaysia's online homemade food sector, rather than statistically generalisable estimates of all homemade food producers or direct measurements of food safety compliance. Nevertheless,

triangulation across multiple data sources enhanced the depth of interpretation by allowing areas of convergence and difference to be examined from several perspectives.

7.7 Suggestions for Future Research

The limitations identified above provide a basis for several directions for future research. Further empirical and applied research is required to strengthen understanding of producers who remain difficult to identify, examine food safety practices within domestic environments and evaluate governance mechanisms appropriate to Malaysia's online homemade food sector.

First, future research should address the absence of a reliable sampling frame for online homemade food producers. Research could map the wider producer population through collaboration among relevant regulatory authorities, local councils, business registration bodies, producer associations and, where appropriate, digital platforms. Establishing a more systematic population profile would support probability-based or stratified sampling and improve the generalisability of future findings. Attention should be given to unregistered, intermittent and otherwise hard-to-reach producers who operate outside certification schemes and formal supply chains, as these groups may experience food safety governance differently from more visible producers.

Second, future research should incorporate direct observational and ethnographic approaches to examine food preparation within domestic environments. The present study relied largely on reported practices because systematic observation of private kitchens was not feasible. Future studies could use ethically appropriate methods such as limited-duration observations, participant-led kitchen mapping, annotated photographs or video

diaries. These approaches could provide deeper insight into workflow, cross-contamination risks, storage, cleaning routines, kitchen constraints and how producers adapt general food safety requirements to domestic settings, while maintaining appropriate privacy and informed-consent safeguards.

Third, further research should examine the effectiveness and retention of food safety training among home-based producers. Longitudinal studies could investigate how knowledge and safety practices change over time following training and whether periodic refresher training produces sustained improvements. Comparative research could also examine differences in training content, delivery and accessibility. Building on these findings, intervention studies could evaluate home-specific educational approaches, including short instructional videos, visual SOP materials and mobile-friendly refresher or micro-learning modules.

Fourth, future research should investigate the feasibility of collaboration between food safety authorities and digital platforms. Studies could examine whether voluntary mechanisms such as food safety information, certification guidance, verification indicators, reporting pathways or producer directories could improve traceability and access to regulatory information. Research should also consider the legal, privacy, accountability and practical implications of information sharing between platforms and regulatory authorities rather than assuming that platforms should perform formal regulatory functions.

Fifth, the role of vendors, caterers and supermarkets as market-based governance actors warrants further investigation. Future research could compare procurement requirements across different types of commercial intermediaries and assess whether these requirements are consistently applied. It would also be valuable to examine whether vendor-mediated

requirements are associated with improvements in food safety practices and whether they create unintended barriers for small-scale, rural or resource-constrained producers.

Sixth, future research should prioritise the development and empirical evaluation of home-based food safety SOPs. Collaborative research involving regulators, food technologists and home-based producers could develop practical guidance reflecting the diversity of domestic kitchens. Pilot studies could then assess usability, clarity, feasibility, producer acceptance and barriers to adoption, followed by evaluation of whether the SOP produces measurable improvements in food safety practices.

Finally, future research could extend the present study through longitudinal and comparative research. Longitudinal studies could examine changes in registration, certification, food safety practices, vendor relationships and digital-platform use as businesses develop. Comparative studies across jurisdictions or other forms of informal and digitally mediated food production could also test the applicability of the Food Safety Governance Framework developed in this study. Such research would help distinguish governance mechanisms that are specific to the Malaysian context from those that may have wider relevance.

7.8 Conclusion

This study set out to examine how food safety can be governed within the rapidly developing context of online homemade food production in Malaysia. The research was motivated by a fundamental governance challenge: food production is increasingly taking place within private domestic environments and is being facilitated through digital platforms, while regulatory systems have traditionally been designed around identifiable

and formally regulated food premises. By addressing registration and traceability, food preparation and safety practices, and the development of appropriate SOPs and guidelines, this study has demonstrated that the governance of online homemade food production cannot be understood solely through conventional regulatory enforcement.

The findings reveal that the central challenge is not simply whether food safety requirements exist, but how those requirements can be made visible, understood and applied within a sector characterised by informality, domestic production and digital intermediation. Registration and traceability remain important weaknesses because a proportion of producers operate outside formal certification and regulatory visibility, particularly those who sell directly through social media. At the same time, the study demonstrates that producers are not necessarily disengaged from food safety. Many recognise their responsibility to protect consumers and attempt to apply safe practices based on training, experience, personal values and guidance received from food technologists. The difficulty arises because these practices are implemented within domestic environments that differ substantially in their physical conditions, resources, routines and constraints.

This distinction is important to the overall conclusion of the study. The findings suggest that the absence of direct statutory control does not mean the absence of governance. Instead, governance is distributed across several actors and mechanisms. Food technologists provide regulatory guidance and educational support; producers exercise individual responsibility; vendors, caterers and supermarkets establish market-based requirements; and digital platforms create the environment through which producers become visible to consumers. These relationships collectively shape food safety behaviour,

although they do not yet form a fully integrated governance system. The study therefore moves beyond a narrow understanding of food safety governance as enforcement by a regulatory authority and demonstrates the importance of considering the wider network through which food safety expectations are communicated, reinforced and implemented. The research also demonstrates that the application of formal food safety requirements to domestic production requires careful adaptation. Conventional approaches developed for conditions vary considerably and regulatory access is inherently limited. The findings indicate that producers respond positively to practical guidance, supportive engagement and requirements that they can understand and incorporate into their everyday operations. Consequently, the development of home-specific SOPs should not be viewed merely as the creation of additional regulatory requirements. Rather, such SOPs should provide a practical bridge between general food safety principles and the realities of domestic food production.

Building on these findings, the study developed the Food Safety Governance Framework comprising seven interconnected domains: control and leadership, registration and traceability, enforcement, cooperation, communication, education and competence. The framework brings together the principal governance mechanisms identified empirically throughout the study and provides a way of understanding how responsibility and influence are distributed across regulators, producers and other actors. Its significance lies in recognising that effective governance within an informal and digitally mediated food sector depends on the interaction between formal authority and softer mechanisms such as education, communication, cooperation, market expectations and producer responsibility.

The study therefore suggests that the future strengthening of food safety governance in Malaysia should not depend upon a single regulatory mechanism. A more appropriate approach is one that combines improved producer visibility and traceability with accessible education, practical guidance, supportive regulatory engagement and appropriate participation from market and digital actors. Such an approach would allow regulatory expectations to reach producers who may otherwise remain outside conventional oversight while recognising the domestic, small-scale and entrepreneurial nature of their activities. Ultimately, this research demonstrates that the governance of online homemade food production is a question of adaptation. As food entrepreneurship moves beyond conventional premises and increasingly takes place through digital and domestic spaces, food safety governance must also adapt to these changing conditions. The contribution of this study is therefore not limited to identifying existing regulatory gaps; it provides an empirically grounded way of understanding how different actors and governance mechanisms can work together within this emerging food system. The proposed framework and associated findings provide a foundation for strengthening food safety governance in Malaysia while recognising the practical realities faced by home-based producers.

Although the study is subject to the methodological and contextual limitations discussed earlier, it provides a foundation upon which further research, policy development and practical intervention can build. Future work can test the applicability of the framework, evaluate home-specific SOPs and examine how governance arrangements develop as digital food entrepreneurship continues to expand. In this sense, the study concludes that protecting public health within the online homemade food sector does not require domestic producers to be treated simply as conventional commercial food premises; rather, it

requires governance to evolve alongside the way food is produced, marketed and consumed. This provides a basis for pursuing a food safety system that is more visible, responsive and appropriate to the realities of Malaysia's emerging homemade food economy.

CHAPTER EIGHT
REFLECTION OF THE RESEARCH PROCESS

"A journey of a thousand miles begins with a single step, but it is perseverance, faith, and resilience that carry one to the end. Indeed, Allah has power over all things."

(Adapted from Lao Tzu, c. 6th century BCE; The Holy Qur'an, 2:20)

Embarking on a doctoral journey was not a sudden or impulsive decision, but rather the culmination of years of curiosity, reflection, professional growth, and a deep desire to contribute meaningfully to knowledge. From the very beginning of my academic life, I have been driven by an insatiable curiosity to understand complex issues, question established practices and explore how research can inform better decision making and governance. This curiosity gradually grew into a passion for research, which ultimately guided my decision to pursue a PhD at the University of Sunderland.

Being born and raised in Malaysia, a developing economy, I have witnessed first-hand the disparities in access to quality education and research resources. These lived experiences shaped my belief that higher education is not merely a personal achievement, but a responsibility to contribute back to society. After careful consideration, I firmly believed that pursuing a PhD in the United Kingdom would provide me with the intellectual platform, academic rigour, and global exposure necessary to enhance my knowledge in a meaningful and impactful way. At the same time, my role as a lecturer in Malaysia became a significant push factor. I recognised that advancing within the academic profession required deeper research expertise, international experience, and scholarly independence. The PhD therefore represented both personal growth and professional responsibility.

My interest in academic research was first ignited during my undergraduate years, when I was introduced to the world of scholarly inquiry and the role of academics as knowledge creators rather than mere knowledge transmitters. That fascination never faded. Glory be to God, I was later selected for an online PhD interview under the supervision of Associate Professor Dr. Derek Watson, an expert in my research area. From our very first virtual meeting, he believed in my potential, my research ideas, and my ability to complete this journey. His trust and confidence in me laid the emotional and intellectual foundation for what would become both the most challenging and transformative period of my life.

The real roller coaster began when I arrived in England without financial security, with no grant, scholarship or student loan. I was entirely self-funded, a reality that weighed heavily on my mental and emotional well-being. During this period, my supervisor played a crucial role beyond academic guidance. He consistently checked on my welfare, encouraged me to remain resilient, discussed scholarship and grant opportunities with me, and motivated me to seek part-time employment. Through this encouragement, I secured employment as a Teaching Assistant in SEND schools and colleges. This role not only supported me financially but also enriched my understanding of inclusivity, patience, and resilience.

Balancing work and a PhD intensified my anxiety, particularly when comparing myself to fully funded PhD students who could devote uninterrupted time to reading and writing. I soon realised that progress does not require perfection or rigid schedules. I adopted a personal principle that as long as I made some progress related to my research each day, that day was not wasted. This shift in mindset highlighted the importance of sustainable productivity and self-regulation in long-term research projects allowing me to sustain

momentum despite constraints and reaffirmed that perseverance matters more than ideal conditions.

One of the earliest academic challenges I encountered was writing the literature review. At the beginning of my research journey, synthesising vast bodies of literature felt overwhelming. Understanding theories, critically engaging with prior studies, identifying gaps, and translating all of this into a coherent narrative required a level of intellectual discipline that far exceeded my previous research experience. This phase tested my patience and confidence. In retrospect, my initial lack of a structured approach to organising literature contributed to this difficulty. However, through continuous reading, rewriting, and guidance from my supervisor, the literature review evolved from a source of anxiety into a foundation of scholarly confidence. It was during this stage that I truly learned how knowledge is built, debated, and refined within academia, which strengthened my ability to critically evaluate existing research and identify meaningful gaps.

The complexity of my research increased significantly when my supervisor and I mutually agreed to adopt a triangulation approach. Initially, I intended to conduct a purely qualitative study. However, incorporating a mixed methods design required extensive planning, methodological competence, and sustained effort. Managing quantitative surveys alongside qualitative interviews and focus groups demanded not only technical skills but also analytical depth. This rigorous approach pushed me beyond my comfort zone and ultimately strengthened my research credibility. This highlighted the importance of methodological flexibility and the value of combining multiple data sources to enhance the validity and robustness of findings. As a result of this methodological expansion, I actively

participated in academic conferences and presented posters and papers, which further enhanced my confidence and sense of scholarly identity.

Data collection proved to be one of the most demanding phases of my PhD. Gaining access to Ministry of Health food technologists required nearly three (3) months of persistent communication, approvals, and coordination. Their willingness to participate was invaluable, but the process tested my resilience and organisational skills. This experience highlighted the critical role of gatekeepers in research access and the importance of sustained professional engagement. Reaching homemade food producers presented a different set of challenges. Although they were more accessible, many questioned the direct benefit of participating in my research. These interactions taught me the realities of conducting research within informal sectors, where trust, motivation, and perceived relevance strongly influence participation. It also emphasised the need to consider how participant perceptions may influence data quality and engagement levels.

Midway through my research journey, my life changed profoundly when I became pregnant with my first child. Informing my supervisor about my pregnancy marked another turning point. Rather than viewing this as a setback, he encouraged me to continue progressing with my research, recognising both my capabilities and the challenges ahead. On 30 November 2025, my baby boy was born. Although the Faculty granted me 60 days of maternity leave, I continued writing my thesis gradually, progressing slowly but consistently alongside my responsibilities as a new mother.

Motherhood required strength beyond imagination. Balancing sleepless nights, emotional adjustments, academic responsibilities, and shifts in personal identity was undeniably one of the most challenging periods of my life. Yet it also became a profound source of

resilience. Many parts of this thesis were written while my baby rested in my arms or on my lap, sometimes for hours, when he was unsettled or crying. In those moments, progress was measured not by speed, but by persistence. I learned to find quiet windows of time, often when my baby was asleep, which became meaningful moments for reading, writing, and reflecting on my research. This experience highlighted my ability to adapt working practices under constraint and reinforced the value of consistency over intensity in research productivity. Holding my child while continuing this journey taught me patience, perspective, and an enduring sense of purpose.

During this period, I updated my supervisor about my conference presentation, and his response remains deeply meaningful to me. *"Congratulations Husmila. Your son will be proud of his mum. Excellent news."* That moment reaffirmed my belief that supportive supervision can truly change lives. I thank God sincerely for granting me an exceptional supervisor who never lost faith in me, even during moments when I felt at the lowest point of my journey.

Reflecting on the research process, I now understand that a PhD is not simply an academic qualification, but a transformative process that develops resilience, critical thinking, and intellectual independence. This journey has strengthened my capacity to undertake complex research, make informed methodological decisions, and critically engage with both theory and practice. Every challenge strengthened my voice, every difficulty sharpened my purpose, and every milestone reaffirmed why I began this journey.

Completing this research does not mark an end, but rather a transition. It has deepened my passion for academic inquiry and strengthened my commitment to contributing to food safety governance, particularly within informal and developing economy contexts. Most

importantly, it has taught me that meaningful research is not created in comfort, but forged through patience, adaptability, and a clear sense of purpose as an emerging independent researcher.

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Appendices

Appendix 8.1 *Food Contamination Cases in Malaysia*

Food Item and Image	Description of the Food Poisoning Incident
 *Laksa Kebok*	*Laksa Kebok* is a local variant of laksa in Kedah, characterised by rice flour noodles produced using a *kebok* machine and served with mackerel-based gravy. On 4 October 2018, consumption of *Laksa Kebok* purchased from a stall in Kupang, Baling, led to a large-scale food poisoning outbreak affecting three Malaysian states, namely Kedah, Perak and Selangor. A total of 83 confirmed cases were reported, including two fatalities. Laboratory investigations identified *Salmonella enterica* serovar Weltevreden in both clinical samples and the laksa noodles. The outbreak was associated with improper food handling and storage practices during preparation and distribution (Berita Harian, 2018a; Hanafi et al., 2021).

 *Ayam Masak Merah*	*Ayam masak merah* is a traditional Malaysian chicken dish commonly served at wedding banquets. On 1st of October 2013, contamination of this dish at a wedding in Kampung Huma, Tanjung Dawai, Kedah resulted in the most severe wedding-related food poisoning incident recorded in Malaysia. The outbreak caused four deaths, 65 hospitalisations and medical treatment for more than 170 guests. Laboratory analysis confirmed the presence of Salmonella bacteria in the food served. The incident highlighted serious lapses in food preparation and hygiene during large-scale catering events (Astro Awani, 2013; Berita Harian, 2013b).
 *Fried bihun and fried eggs*	In June 2024, fried *bihun* and fried eggs served during a district-level school programme in Gombak, Selangor caused a significant food poisoning outbreak. Of 247 attendees, 82 individuals developed symptoms, and two fatalities were recorded, involving a 17-year-old student and a two-year-old child. Investigations by the Selangor Health Department confirmed Salmonella contamination in the food items. The case underscored the risks associated with mass catering and inadequate food safety controls during educational events (Berita Harian, 2024; The Star, 2024a).

 *Nasi Lemak*	On 22nd of July 2024, a food poisoning incident involving *nasi lemak* occurred at Sekolah Kebangsaan Pulau Gaya, Sabah, affecting 103 pupils aged between 6 and 12 years. Although no fatalities were reported, eight (8) pupils required hospitalisation. Health authorities identified the *nasi lemak* served during school recess as the likely source of contamination. Prompt public health intervention and control measures were implemented, highlighting the importance of food safety compliance within school feeding environments (Malay Mail, 2024b; Borneo Post Online, 2024).
 Chicken spicy dish (*Ayam pedas*)	In April 2016, 29 pupils at Sekolah Kebangsaan Tiong, Kota Bharu, Kelantan experienced food poisoning after consuming *ayam pedas* purchased from the school canteen. Symptoms appeared shortly after consumption and included vomiting, nausea and abdominal pain. Investigations revealed inadequate food handling practices, resulting in the temporary closure of the canteen and enforcement action against the operator. This incident emphasised the vulnerability of children to foodborne illness in school settings (Malay Mail, 2016a, 2016b).

Appendix 8.2 *Initial Interview Guide*



Hi there,

Ref : An Exploratory Study on Food Safety in Malaysia : The Governance of Homemade Food Producers.

Referring to the above matter, I am pleased to inform that your esteemed business has been selected as one of the respondents for the academic research mentioned. This study is mainly to establish a focus on food safety governance towards homemade food producers in Malaysia.

The purpose of this research is to better understand current food handling practices among homemade food producers operating through online platforms. Thus, your participation is highly crucial in helping us explore how food safety standards and guidelines are understood, applied and governed in the context of home-based food businesses.

The questionnaire will take approximately 15-20 minutes to complete. We would greatly appreciate it if you could complete the questionnaire and return it as soon as possible via email to : husmila@gmail.com.

Your response will be treated with strict confidentiality and will remain completely anonymous. No individual answers can be traced back to you or your business. The information collected will be used solely for academic purposes.

I would also like to take this opportunity to thank you in advance for your participation, co-operation and time in this survey.

Kind Regards,

Siti Husmila Binti Hussin
Doctoral Student (239590231)
Faculty of Business and Technology,
The University of Sunderland,
Edinburgh Building, City Campus,
Chester Road, Sunderland SR1 3SD.

Associate Professor Dr. Derek Watson (Supervisor)
Faculty of Business and Technology,
The University of Sunderland,
Edinburgh Building, City Campus,
Chester Road, Sunderland SR1 3SD.

PART A : DEMOGRAPHIC INFORMATION

1. What is your current job title?
   Apakah jawatan anda sekarang?

- ○ Food Safety Officer
  Pegawai Keselamatan Makanan
- ○ Food Technologist
  Ahli Teknologi Makanan
- ○ Health Inspector
  Inspektor Kesihatan
- ○ Environmental Health Officer
  Pegawai Kesihatan Persekitaran
- ○ Public Health Officer
  Pegawai Kesihatan Awam
- ○ Regulatory Officer (Food Sector)
  Pegawai Penguatkuasa (Sektor Makanan)
- ○ Academic / Researcher in Food Safety
  Ahli Akademik / Penyelidikan dalam Keselamatan
- ○ Others (Please specifiy)
  Lain-lain (sila nyatakan)
  _____

2. Which organisation or agency do you work for? OR which state in Malaysia is your workplace located?
   Agensi atau organisasi manakah anda bekerja? ATAU negeri manakah tempat kerja anda berada?

- ○ Ministry of Health Malaysia (MOH)
  Kementerian Kesihatan Malaysia (KKM)
- ○ State Health Department – Johor
  Jabatan Kesihatan Negeri Johor
- ○ State Health Department – Kedah
  Jabatan Kesihatan Negeri Kedah
- ○ State Health Department – Kelantan
  Jabatan Kesihatan Negeri Kelantan
- ○ State Health Department – Malacca
  Jabatan Kesihatan Negeri Melaka
- ○ State Health Department–Negeri Sembilan
  Jabatan Kesihatan Negeri Sembilan
- ○ State Health Department – Pahang
  Jabatan Kesihatan Negeri Pahang
- ○ State Health Department – Penang
  Jabatan Kesihatan Negeri Pulau Pinang
- ○ State Health Department – Perak
  Jabatan Kesihatan Negeri Perak
- ○ State Health Department – Perlis
  Jabatan Kesihatan Negeri Perlis
- ○ State Health Department – Sabah
- ○ State Health Department – Sarawak

Jabatan Kesihatan Negeri Sabah

Jabatan Kesihatan Negeri Sarawak

- ○ State Health Department – Selangor
  Jabatan Kesihatan Negeri Selangor
- ○ State Health Department – Terengganu
  Jabatan Kesihatan Negeri Sarawak
- ○ Federal Territory Health Department – Kuala Lumpur / Putrajaya / Labuan
  Jabatan Kesihatan Wilayah Persekutuan
- ○ Others (Please specifiy)
  Lain-lain (sila nyatakan)

_____

3. How many years of experience do you have in food safety or food technology?
   Berapa tahun pengalaman anda dalam bidang keselamatan makanan atau teknologi makanan?

- ○ Less than 1 year
  Kurang dari setahun
- ○ 1–3 years
  1–3 tahun
- ○ 4 –5 years
  4 –5 tahun
- ○ 6 –10 years
  6 – 10 tahun
- ○ More than 10 years
  Lebih dari 10 tahun

4. What is your highest level of education?
   Apakah tahap pendidikan tertinggi anda?

- ○ Diploma
  Diploma
- ○ Bachelor's Degree
  Ijazah Sarjana Muda
- ○ Master's Degree
  Ijazah Sarjana
- ○ PhD / Doctorate
  Ijazah Kedoktoran (PhD)
- ○ Others. Please state
  Lain-Lain. Sila nyatakan

_____

5. Have you received any formal training in food safety governance or policy enforcement?
   Adakah anda menerima latihan formal dalam tadbir urus keselamatan makanan atau penguatkuasa polisi?

○ Yes
Ya

○ No
Tidak

PART B : INTRODUCTORY QUESTIONS

I would appreciate it if you could include a few additional Likert-scale questions in the introductory section, as outlined. Husmila, I've reviewed your interview questions for food technologists / Food Safety Officers, below is a summary of how my suggested survey items correspond with them;

Survey Question	Related Interview Question	Overlap Level	Notes
Registration is essential for traceability	What are the challenges in getting producers to register?	☑ Partial	Survey captures belief; interview explores challenges.
Policies encourage registration	What strategies/incentives could be introduced?	☑ Partial	Survey is opinion-based; interview seeks solutions.
Platforms should support registration	How can platforms collaborate with authorities?	☑ Strong	Both address platform collaboration.
Homemade producers lack safety awareness	How do practices differ from formal businesses?	☑ Strong	Both explore gaps in safety practices.
Informal businesses pose higher risks	What are common food safety risks?	☑ Strong	Survey generalizes; interview seeks specifics.
Tools/frameworks exist for home settings	Are there existing tools/frameworks?	☑ Strong	Direct overlap.

Survey Question	Related Interview Question	Overlap Level	Notes
SOPs should be developed	What kind of SOPs are relevant?	☑ Strong	Both address SOP needs.
Enforcement mechanisms are feasible	What enforcement mechanisms could be applied?	☑ Strong	Direct overlap.
Education is more effective than punishment	How to balance education and enforcement?	☑ Partial	Survey is opinion-based; interview explores strategy.

PART C : SEMI-STRUCTURED INTERVIEW QUESTIONS

Target Respondents : Food Technologists / Food Safety Officers in Malaysia.

Leadership / Control / Process

1. In your view, what are the main challenges in getting online homemade food producers to register their business?
   Pada pandangan anda, apakah cabaran utama bagi memastikan pengusaha makanan buatan sendiri secara atas talian mendaftarkan perniagaan mereka.

2. What strategies or incentives could be introduced to encourage registration among informal or home-based food producers / sellers?
   Apakah strategi atau insentif yang boleh diperkenalkan untuk menggalakkan pendaftaran dalam kalangan pengusaha atau penjual makanan

3. How can digital support (e.g., Grab, Shopee, Facebook) collaborate with authorities to support traceability and registration?
   Bagaimanakah platform digital (Cth : Grab, Shopee, Facebook) boleh bekerjasama dengan pihak berkuasa untuk menyokong kebolehkesanan dan pendaftaran?

4. What role should local councils or health departments play in monitoring unregistered food businesses?
   Apakah peranan yang perlu dimainkan oleh pihak berkuasa tempatan atau jabatan kesihatan dalam memantau perniagaan makanan yang tidak berdaftar?

Co-operation

1. Based on your experience, how do food safety practices among online homemade food producers differ from those in formal food businesses?
   Berdasarkan pengalaman anda, bagaimana amalan keselamatan makanan dalam kalangan pengeluar makanan buatan sendiri atas talian berbeza daripada perniagaan makanan formal?

2. What are the most common food safety risks you observe in home-based food production?
   Apakah risiko keselamatan makanan yang paling biasa anda perhatikan dalam pengeluaran makanan buatan sendiri.

3. How can food safety officers effectively monitor or assess hygiene practices in informal or home settings?
   Bagaimanakah pegawai keselamatan makanan boleh memantau atau menilai amalan kebersihan secara berkesan dalam persekitaran tidak formal atau rumah?

4. Are there any existing tools or frameworks that can be adapted for use in the homemade food sector?
   Adakah terdapat sebarang alatan atau rangka kerja sedia ada yang boleh disesuaikan untuk digunakan dalam sektor makanan buatan sendiri.

Communication

1. What kind of SOPs or guidelines would be most relevant for online homemade food producers?
   Apakah jenis SOP atau garis panduan yang paling relevan untuk pengeluar makanan buatan sendiri secara atas talian?

2. How can these guidelines be communicated effectively to informal food producers / sellers, especially those without formal training?
   Bagaimanakah garis panduan ini boleh disampaikan dengan berkesan kepada penjual makanan tidak formal, terutamanya yang tidak mempunyai latihan formal?

3. What enforcement mechanisms (e.g., inspections, digital reporting, platform-based compliance) could be realistically applied to this sector?
   Apakah mekanisme penguatkuasaan (cth : pemeriksaan, laporan digital, pematuhan berasaskan platform) yang boleh dilaksanakan secara realistik dalam sektor ini.

4. How can food safety officers balance education and enforcement when dealing with informal food producers?

Bagaimanakah pegawai keselamatan makanan boleh menyeimbangkan antara pendidikan dan penguatkuasaan apabila berurusan dengan pengeluar makanan tidak formal.

Competent

1. What role should government agencies, NGOs, and private platforms play in governing food safety in the online homemade food sector?
   Apakah peranan yang perlu dimainkan oleh agensi kerajaan, NGO dan platform swasta dalama mentadbir keselamatan makanan dalam sektor makanan buatan sendiri secara atas talian.

2. How can inter-agency collaboration be improved to support safer food practices among home-based producers?
   Bagaimanakah kerjasama antara agensi boleh dipertingkatkan untuk menyokong amalan makanan yang lebih selamat dalam kalangan pengeluar makanan buatan sendiri.

3. What policy recommendations would you suggest to improve food safety governance in this growing sector?
   Apakah cadangan polisi yang anda syorkan untuk memperbaiki tadbir urus keselamatan makanan dalam sektor yang sedang berkembang ini.

Concluding Questions

1. Is there anything else you would like to share regarding the governance of food safety / food safety culture among online homemade food producers in Malaysia.
   Adakah perkara lain yang anda ingin kongsikan berkaitan tadbir urus keselamatan makanan dalam kalangan pengeluar makanan buatan sendiri secara atas talian di Malaysia?

Appendix 8.3 *Approval Letter*

University of Sunderland

Downloaded: 02/09/2025
Approved: 28/07/2025

Husmila Hussin
Sunderland Business School
Programme: Doctor of Philosophy Business & Management (Full Time)

Dear Husmila

PROJECT TITLE: An Exploratory Study on Food Safety in Malaysia: The Governance of Homemade Food Producers
APPLICATION: Reference Number 032533

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 28/07/2025 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 032533 (form submission date: 27/07/2025);

If during the course of the project you need to deviate significantly from the above-approved documentation please email ethics.review@sunderland.ac.uk

For more information please visit: https://www.sunderland.ac.uk/research/governance/researchethics/

Yours sincerely

Appendix 8.4 *Mapping of Questionnaire Items to Research Objectives (RO)*

RO KEY :

RO1 – REGISTRATION FOR TRACEABILITY

RO2 – FOOD PREPARATION PROCESSES AND FOOD SAFETY STANDARDS

RO3 – SOPS AND GUIDELINES IMPLEMENTATION

Food Safety Culture Dimension	Items	Linked Research Objective(s)	Rational / Purpose	Key Supporting Literature
Control / Governance / Leadership / Process	I believe I am fully responsible for food safety in my business.	RO1, RO3	This dimension measures self-governance and leadership in the absence of formal organisational structures. For home-based food producers, control and governance are largely individual-driven, making personal leadership, prioritisation, and process discipline central to food safety outcomes. The items assess: • Personal accountability for food safety responsibility • Strategic prioritisation of food safety in business decisions	Watson, Yap, *et al.* (2018) Watson *et al.* (2022) Griffth *et al.* (2017a) Griffth *et al*. (2010) Brinke and Keltner (2020) Jespersen *et al.* (2017)
	I have clear goals and practices to ensure food safety in my operations.	RO2, RO3		
	I allocate enough time and resources to maintain food safety.	RO2, RO3		
	I consider food safety a key priority in my business decisions.	RO1, RO3		
	I take food safety seriously even when I am busy or under pressure.	RO2		
	I act quickly when I notice any food safety issues.	RO2, RO3		
	I plan my work schedule to allow time for cleaning and safe food handling.	RO2		
	I believe food safety is part of my daily routine.	RO2		

	I keep records (e.g., photos, notes) of food preparation or delivery.	RO1	• Operational control through planning, record-keeping, and review • Responsiveness to food safety risks and incidents These aspects reflect governance through behaviour and decision-making rather than formal regulatory enforcement, which is particularly relevant for online informal food businesses.	
	I ensure that protective measures (e.g., gloves, clean attire) are followed.	RO2		
	I regularly check and improve my food safety practices.	RO3		
	I believe my efforts contribute to a positive food safety culture.	RO3		
	I believe my performance in food safety affects customer trust and satisfaction.	RO1		
	In my business, food safety is a shared responsibility among all involved.	RO3		
Co-operation	I take personal responsibility for food safety in my business.	RO1, RO3	This dimension focuses on co-operation, responsibility, and empowerment in managing food safety within informal and home-based food businesses. In the absence of supervisors or formal teams, food safety relies heavily on individual confidence, learning orientation, and willingness to engage with guidance and others. The items examine personal responsibility, self-efficacy in identifying and correcting issues,	Watson, Yap, *et al.* (2018) Watson *et al.* (2022) De Boeck *et al.* (2017) Basterretxea *et al*. (2019)
	I am confident in identifying and correcting food safety issues.	RO2		
	I am open to learning from past mistakes or customer feedback.	RO3		
	I know how to report or respond to food safety concerns.	RO1, RO3		
	I have access to food safety guidelines or resources relevant to my business.	RO3		
	I believe sharing food safety knowledge with others is important.	RO3		
	Even during busy periods, I ensure food safety is not compromised.	RO2		

			openness to learning from mistakes and feedback, access to guidance, and the ability to maintain food safety during busy periods. These elements indicate the extent to which producers feel empowered to manage food safety risks independently and engage with formal systems when required.	
Communication	I clearly communicate food safety information to my customers (e.g., storage, expiry).	RO1	This dimension examines communication as a key governance mechanism in online homemade food businesses, where direct face-to-face interaction with customers and regulators is limited. Communication plays a critical role in building trust, ensuring transparency, and enabling informal monitoring through customer feedback and digital platforms. The items assess how food safety information is communicated to customers, how producers seek and interpret guidance, and how feedback and online reviews are used to improve practices. These communication processes support traceability, consumer confidence, and readiness for formal regulatory engagement.	Watson, Yap, *et al.* (2018) Watson *et al.* (2022) GFSI (2019) Caccamo *et al.* (2018) Holzwarth *et al*. (2020) Yiannas (2009) Fatimah *et al.* (2014b)
	I regularly update myself on food safety issues or best practices.	RO2		
	I take action if I notice unsafe practices in my kitchen.	RO2		
	I find food safety guidelines easy to understand and follow.	RO3		
	I inform customers if there are changes in how I prepare or store food.	RO1		
	I am open to customer suggestions or complaints about food safety.	RO3		
	I believe online reviews and feedback help improve my food safety practices.	RO3		
	I use various methods (e.g., social media, messages) to communicate food safety information.	RO1		
Competence	I understand the food safety risks to the ingredients I use.	RO2		Watson, Yap, *et al.* (2018)

	I have been trained (formally or informally) in food safety practices.	RO2	This dimension captures competence, training, and development as foundational elements of food safety culture among home-based food producers. Given the varied levels of formal training in this sector, competence depends on both knowledge acquisition and the consistent application of food safety principles in daily practice. The items assess understanding of food safety risks, exposure to training, awareness of critical preparation steps, and attitudes toward continuous learning. Together, these aspects indicate the capacity of producers to implement safe food handling practices and their readiness to comply with future training requirements or standard operating procedures.	Watson *et al.* (2022) Da Cunha *et al*. (2014) Cappelli and Conyon, (2018) De Boeck *et al. (*2015) Yiannas (2009)
	I believe all food handlers in my business should be trained.	RO3		
	I understand basic food safety principles (e.g., hygiene, temperature control).	RO2		
	I know the critical steps in my food preparation affect safety.	RO2		
	I believe everyone involved in my business plays a role in food safety.	RO3		
	I maintain food safety even when preparing food in batches or over time.	RO2		

Appendix 8.5 *Questionnaire / Survey Online Homemade Food Producers – Stage I*



Pilot Study / Survey

Hi there,

Ref : An Exploratory Study on Food Safety in Malaysia : The Governance of Homemade Food Producers.

Referring to the above matter, I am pleased to inform that your esteemed business has been selected as one of the respondents for the academic research mentioned. This study is mainly to establish a focus on food safety governance towards homemade food producers in Malaysia.

The purpose of this research is to better understand current food handling practices among homemade food producers operating through online platforms. Thus, your participation is highly crucial in helping us explore how food safety standards and guidelines are understood, applied and governed in the context of home-based food businesses.

The questionnaire will take approximately 15-20 minutes to complete. We would greatly appreciate it if you could complete the questionnaire and return it as soon as possible via email to : husmila@gmail.com.

Your response will be treated with strict confidentiality and will remain completely anonymous. No individual answers can be traced back to you or your business. The information collected will be used solely for academic purposes.

I would also like to take this opportunity to thank you in advance for your participation, co-operation and time in this survey.

Kind Regards,

Siti Husmila Binti Hussin
Doctoral Student (239590231)
Faculty of Business and Technology,
The University of Sunderland,
Edinburgh Building, City Campus,
Chester Road, Sunderland SR1 3SD.

Associate Professor Dr. Derek Watson (Supervisor)
Faculty of Business and Technology,
The University of Sunderland,
Edinburgh Building, City Campus,

Chester Road, Sunderland SR1 3SD.

PART A : DEMOGRAPHIC INFORMATION

Target Respondents : Online Homemade Food Producers

1. What type of homemade food do you produce or sell?
   Apakah jenis makanan buatan sendiri yang anda hasilkan atau jual?

- ○ Traditional Malay Dishes
  e.g., Nasi lemak, rendang, sambal, kuih muih.
  Masakan Tradisional Melayu
- ○ Chinese Dishes
  e.g., Dim sum, fried rice, dumplings, herbal soups.
  Masakan Cina
- ○ Indian Dishes
  e.g., Roti canai, curry, biryani, thosai.
  Masakan India
- ○ Western Food
  e.g., Pasta, burgers, grilled chicken, baked potatoes.
  Masakan Barat
- ○ Baked Goods & Pastries
  e.g., Cakes, cookies, tarts, brownies
  Kek & Pastri
- ○ Snacks & Finger Food
  Popia, keropok lekor, nuggets, fries.
  Snek & Makanan Ringan
- ○ Frozen or Ready-to-Cook Meals
  e.g., Frozen lasagna, marinated meats, frozen curry puffs.
  Makanan Sejuk Beku / Sedia Masak
- ○ Healthy or Diet-Specific Meals
  e.g., Keto, vegetarian, vegan, low-carb meals.
  Makanan Sihat / Diet Khas
- ○ Beverages
  e.g., Homemade juices, milk tea, herbal drinks.
  Minuman buatan sendiri
- ○ Others (Please specifiy)
  Lain-lain (sila nyatakan)
  _____

2. How long have you been running your online food business?
   Berapa lama anda telah menjalankan perniagaan makanan secara atas talian.

- ○ Less than 1 year
  Kurang dari setahun
- ○ 1-3 years
  1-3 tahun
- ○ 4-5 years
  4-5 tahun
- ○ 6-10 years
  6-10 tahun
- ○ More than 10 years

Lebih dari 10 tahun

3. Which platform(s) do you use to sell your food?
   Platform manakah yang anda gunakan untuk menjual makanan anda?

- ○ Facebook / Facebook Marketplace
  Facebook
- ○ Instagram
  Instagram
- ○ Foodpanda
  Foodpanda
- ○ GrabFood
  GrabFood
- ○ ShopeeFood
  ShopeeFood
- ○ TikTok
  TikTok
- ○ Telegram
  Telegram
- ○ Youbeli / Kravve / BeliLocal
  Youbeli / Kravve / BeliLocal
- ○ Lazada
  Lazada
- ○ Misi
  Misi
- ○ Thread
  Thread
- ○ X / Twitter
  X / Twitter
- ○ Messenger
  Pesanan
- ○ Misi
  Misi
- ○ Bekal
  Bekal
- ○ Lalamove
  Lalamove

4. What is your role in the business?
   Apakah peranan anda dalam perniagaan ini?

- ○ Owner
  Pemilik
- ○ Co-owner
  Pemilik Bersama
- ○ Helper
  Pembantu
- ○ Others. Please state
  Lain-Lain. Sila nyatakan

_____

5. Do you have any formal food safety training or certification?
   Adakah anda mempunyai latihan atau sijil keselamatan makanan secara formal?

○ Yes
Ya

○ No
Tidak

6. What is your highest level of education?
Apakah tahap pendidikan tertinggi anda?

○ Primary school
Sekolah rendah

○ Secondary school
Sekolah menengah

○ Tertiary / College / University
Pendidikan tinggi / Kolej / Universiti

○ No formal education
Tiada pendidikan formal

7. What is your gender?
Apakah jantina anda?

○ Female
Perempuan

○ Male
Lelaki

8. What is your age range?
Apakah julat umur anda?

○ Under 18 years old
Bawah 18 tahun

○ 18-24 years old
18-24 tahun

○ 25-34 years old
25-34 tahun

○ 35-44 years old
35-44 tahun

○ 45-54 years old
45-54 tahun

○ 55-64 years old
55-64 tahun

○ 65 years and above
65 tahun ke atas

9. Which state in Malaysia is your food business located in?
Sila nyatakan negeri mana di Malaysia perniagaan makanan anda dijalankan?

○ Kedah
Kedah

○ Penang
Pulau Pinang

○ Pahang *Pahang*	○ Kelantan *Kelantan*
○ Kuala Lumpur *Kuala Lumpur*	○ Selangor *Selangor*
○ Perlis *Perlis*	○ Terengganu *Terengganu*
○ Malacca *Melaka*	○ Johor *Johor*
○ Negeri Sembilan *Negeri Sembilan*	○ Perak *Perak*
○ Sabah *Sabah*	○ Sarawak *Sarawak*

PART B : FOOD SAFETY CULTURE DIMENSION

I. CONTROL / GOVERNANCE / LEADERSHIP / PROCESS

1. I believe I am fully responsible for food safety in my business.
   Saya percaya saya bertanggungjawab sepenuhnya terhadap keselamatan makanan dalam perniagaan saya.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

2. I have clear goals and practices to ensure food safety in my operations.
   Saya mempunyai matlamat dan amalan yang jelas untuk memastikan keselamatan makanan dalam operasi saya.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

3. I allocate enough time and resources to maintain food safety.
   Saya memperuntukkan masa dan sumber yang mencukupi untuk mengekalkan keselamatan makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

4. I consider food safety a key priority in my business decisions.
Saya menganggap keselamatan makanan sebagai keutamaan utama dalam keputusan perniagaan saya.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

5. I take food safety seriously even when I am busy or under pressure.
Saya mengambil serius keselamatan makanan walaupun ketika sibuk atau tertekan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

6. I act quickly when I notice any food safety issues.
Saya bertindak segera apabila menyedari sebarang isu keselamatan makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

7. I plan my work schedule to allow time for cleaning and safe food handling.
Saya merancang jadual kerja saya supaya ada masa untuk pembersihan dan pengendalian makanan yang selamat.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

8. I believe food safety is part of my daily routine.
Saya percaya keselamatan makanan adalah sebahagian daripada rutin harian saya.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

9. I keep records (e.g., photos, notes) of food preparation or delivery.
Saya menyimpan rekod (cth : gambar, nota) penyediaan atau penghantaran makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

10. I ensure that protective measures (e.g., gloves, clean attire) are followed.
Saya memastikan langkah perlindungan (cth : sarung tangan, pakaian bersih) dipatuhi.

○ Strongly Disagree	○ Disagree	○ Neutral	○ Agree	○ Strongly Agree

11. I regularly check and improve my food safety practices.
Saya sentiasa menyemak dan menambah baik amalan keselamatan makanan saya.

○ Strongly Disagree	○ Disagree	○ Neutral	○ Agree	○ Strongly Agree

12. I believe my efforts contribute to a positive food safety culture.
Saya percaya usaha saya menyumbang kepada budaya keselamatan makanan yang positif.

○ Strongly Disagree	○ Disagree	○ Neutral	○ Agree	○ Strongly Agree

13. I believe my performance in food safety affects customer trust and satisfaction.
Saya percaya prestasi saya dalam keselamatan makanan mempengaruhi kepercayaan dan kepuasan pelanggan.

○ Strongly Disagree	○ Disagree	○ Neutral	○ Agree	○ Strongly Agree

14. In my business, food safety is a shared responsibility among all involved.
Dalam perniagaan saya, keselamatan makanan adalah tanggunjawab bersama dalam kalangan semua yang terlibat.

○ Strongly Disagree	○ Disagree	○ Neutral	○ Agree	○ Strongly Agree

II. <u>CO-OPERATION</u>

1. I take personal responsibility for food safety in my business.

Saya mengambil tanggungjawab peribadi terhadap keselamatan makanan dalam perniagaan saya.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

2. I am confident in identifying and correcting food safety issues.
Saya yakin dalam mengenal pasti dan membetulkan isu keselamatan makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

3. I am open to learning from past mistakes or customer feedback.
Saya terbuka untuk belajar daripada kesilapan lalu atau maklum balas pelanggan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

4. I know how to report or respond to food safety concerns.
Saya tahu cara melaporkan atau bertindak balas terhadap kebimbangan keselamatan makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

5. I have access to food safety guidelines or resources relevant to my business.
Saya mempunyai akses kepada garis panduan atau sumber keselamatan makanan yang berkaitan dengan perniagaan saya.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

6. I believe sharing food safety knowledge with others is important.
Saya percaya berkongsi pengetahuan keselamatan makanan dengan orang lain adalah penting.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

7. Even during busy periods, I ensure food safety is not compromised.
Walaupun semasa waktu sibuk, saya memastikan keselamatan makanan tidak terjejas.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

III. COMMUNICATION

1. I clearly communicate food safety information to my customer (e.g., storage, expiry).
   Saya menyampaikan maklumat keselamatan makanan dengan jelas kepada pelanggan saya (cth: penyimpanan, tarikh luput).

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

2. I regularly update myself on food safety issues or best practices.
   Saya sentiasa mengemas kini diri saya tentang isu keselamatan makanan atau amalan terbaik.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

3. I take action if I notice unsafe practices in my kitchen.
   Saya mengambil tindakan jika saya menyedari amalan tidak selamat di dapur saya.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

4. I find food safety guidelines easy to understand and follow.
   Saya mendapati garis panduan keselamatan makanan mudah difahami dan diikuti.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

5. I inform customers if there are changes in how I prepare or store food.
   Saya maklumkan pada pelanggan jika terdapat perubahan dalam cara saya menyediakan atau menyimpan makanan.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

6. I am open to customer suggestions or complains about food safety.
   Saya terbuka kepada cadangan atau aduan pelanggan mengenai keselamatan makanan.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

7. I believe online reviews and feedback help improve my food safety practices.
   Saya percaya ulasan dan maklum balas dalam talian membantu meningkatkan amalan keselamatan makanan saya.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

8. I use various methods (e.g., social media, messages) to communicate food safety information to customers or helpers.
   Saya menggunakan pelbagai kaedah (contohnya media sosial, mesej) untuk menyampaikan maklumat keselamatan makanan kepada pelanggan atau pembantu.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

IV. <u>COMPETENCE</u>

1. I understand the food safety risks to the ingredients I use.
   Saya memahami risiko keselamatan makanan yang berkaitan dengan bahan yang saya gunakan.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

2. I have been trained (formally or informally) in food safety practices
   Saya telah dilatih (secara formal atau tidak formal) dalam amalan keselamatan makanan.

   ○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

3. I believe all food handlers in my business should be trained.
   Saya percaya semua pengendali makanan dalam perniagaan saya perlu dilatih.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

4. I understand basic food safety principles (e.g., hygiene, temperature control).
Saya memahami prinsip asas keselamatan makanan. (cth: kebersihan, kawalan suhu).

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

5. I know the critical steps in my food preparation that affect safety.
Saya tahu langkah penting dalam penyediaan makanan saya yang mempengaruhi keselamatan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

6. I believe everyone involved in my business plays a role in food safety.
Saya percaya semua yang terlibat dalam perniagaan saya memainkan peranan dalam keselamatan makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

7. I maintain food safety even when preparing food in batches or over time.
Saya mengekalkan keselamatan makanan walaupun semasa menyediakan makanan secara berkelompok atau dalam tempoh masa yang panjang.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

8. I believe regular refresher training would help me improve my practices.
Saya percaya latihan penyegaran secara berkala akan membantu meningkatkan amalan saya.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

9. I have a positive attitude toward maintaining food safety.
Saya mempunyai sikap positif dalam mengekalkan keselamatan makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

10. I include food safety responsibilities in my daily tasks.
Saya turut memasukkan tanggunjawab-tanggunjawab keselamatan ke dalam tugasan harian saya.

○ Strongly Disagree	○ Disagree	○ Neutral	○ Agree	○ Strongly Agree

11. I avoid doing tasks I am not trained or experienced in.
Saya mengelakkan daripada melakukan tugasan yang saya tidak terlatih atau berpengalaman.

○ Strongly Disagree	○ Disagree	○ Neutral	○ Agree	○ Strongly Agree

12. I understand key food safety principles such as hygiene, temperature control and contamination risks.
Saya memahami prinsip utama keselamatan makanan seperti kebersihan, kawalan suhu dan risiko pencemaran.

○ Strongly Disagree	○ Disagree	○ Neutral	○ Agree	○ Strongly Agree

Appendix 8.6 *Final Interview Guide – Stage II*



Final Interview Guide - Stage Two (II)

Prior to the commencement of the interview, you were provided with a formal invitation via WhatsApp's text. In the text I have explained the purpose of the interview and my research where we both were formally agreed upon. The interview is scheduled to last approximately thirty (45) minutes and will be audio recorded to ensure the accuracy of the data collected.

All responses will be translated into English, the primary language of this research, to maintain consistency and minimise the risk of data loss. You are kindly reminded not to disclose any personal names during the interview, in accordance with ethical research protocols (University of Sunderland, 2023).

PART A : PARTICIPANT PROFILE

10. What is your current job title?
Apakah jawatan anda sekarang?

- ○ Food Safety Officer
Pegawai Keselamatan Makanan
- ○ Food Technologist
Ahli Teknologi Makanan
- ○ Health Inspector
Inspektor Kesihatan
- ○ Environmental Health Officer
Pegawai Kesihatan Persekitaran
- ○ Public Health Officer
Pegawai Kesihatan Awam
- ○ Regulatory Officer (Food Sector)
Pegawai Penguatkuasa (Sektor Makanan)
- ○ Academic / Researcher in Food Safety
Ahli Akademik / Penyelidikan dalam Keselamatan
- ○ Others (Please specifiy)
Lain-lain (sila nyatakan)
_____

11. Which organisation or agency do you work for? OR which state in Malaysia is your workplace located?
Agensi atau organisasi manakah anda bekerja? ATAU negeri manakah tempat kerja anda berada?

- ○ Ministry of Health Malaysia (MOH)
  Kementerian Kesihatan Malaysia (KKM)
- ○ State Health Department – Johor
  Jabatan Kesihatan Negeri Johor
- ○ State Health Department – Kedah
  Jabatan Kesihatan Negeri Kedah
- ○ State Health Department – Kelantan
  Jabatan Kesihatan Negeri Kelantan
- ○ State Health Department – Malacca
  Jabatan Kesihatan Negeri Melaka
- ○ State Health Department–Negeri Sembilan
  Jabatan Kesihatan Negeri Sembilan
- ○ State Health Department – Pahang
  Jabatan Kesihatan Negeri Pahang
- ○ State Health Department – Penang
  Jabatan Kesihatan Negeri Pulau Pinang
- ○ State Health Department – Perak
  Jabatan Kesihatan Negeri Perak
- ○ State Health Department – Perlis
  Jabatan Kesihatan Negeri Perlis
- ○ State Health Department – Sabah
  Jabatan Kesihatan Negeri Sabah
- ○ State Health Department – Sarawak
  Jabatan Kesihatan Negeri Sarawak
- ○ State Health Department – Selangor
  Jabatan Kesihatan Negeri Selangor
- ○ State Health Department – Terengganu
  Jabatan Kesihatan Negeri Sarawak
- ○ Federal Territory Health Department – Kuala Lumpur / Putrajaya / Labuan
  Jabatan Kesihatan Wilayah Persekutuan
- ○ Others (Please specifiy)
  Lain-lain (sila nyatakan)
  _____

12. How many years of experience do you have in food safety or food technology?
    Berapa tahun pengalaman anda dalam bidang keselamatan makanan atau teknologi makanan?

- ○ Less than 1 year
  Kurang dari setahun
- ○ 1–3 years
  1–3 tahun
- ○ 4 –5 years
  4 –5 tahun
- ○ 6 –10 years
  6 – 10 tahun
- ○ More than 10 years
  Lebih dari 10 tahun

13. What is your highest level of education?
Apakah tahap pendidikan tertinggi anda?

- ○ Diploma
  Diploma
- ○ Bachelor's Degree
  Ijazah Sarjana Muda
- ○ Master's Degree
  Ijazah Sarjana
- ○ PhD / Doctorate
  Ijazah Kedoktoran (PhD)
- ○ Others. Please state
  Lain-Lain. Sila nyatakan

14. Have you received any formal training in food safety governance or policy enforcement?
Adakah anda menerima latihan formal dalam tadbir urus keselamatan makanan atau penguatkuasa polisi?

- ○ Yes
  Ya
- ○ No
  Tidak

PART B : INTRODUCTORY QUESTIONS

V. REGISTRATION & TRACEABILITY (OBJECTIVE 1)

15. I believe registration of online homemade food producers is essential for traceability
Saya percaya pendaftaran pengeluar makanan buatan sendiri atas talian adalah penting untuk kebolehkesanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

16. They are sufficient policies in place to encourage registration among informal food producers.
Terdapat polisi yang mencukupi untuk menggalakkan pendaftaran dalam kalangan pengeluar makanan tidak formal.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

17. Digital platforms (e.g GrabFood, Shopee) should collaborate with authorities to support food business registration.
Platform digital perlu bekerjasama dengan pihak berkuasa untuk menyokong pendaftaran perniagaan makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

VI. FOOD PREPARATION & SAFETY STANDARDS (OBJECTIVE 2)

8. Homemade food producers often lack awareness of proper food safety standards.
Pengeluar makanan buatan sendiri sering kurang kesedaran tentang piawaian keselamatan makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

9. Informal food businesses pose higher food safety risks compared to formal ones.
Perniagaan makanan tidak formal mempunyai risiko keselamatan makanan yang lebih tinggi berbanding perniagaan formal.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

10. There are effective tools or framework available to assess food safety in home-based settings.
Terdapat alat atau rangka kerja yang berkesan untuk menilai keselamatan makanan dalam persekitaran rumah.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

VII. SOPs & GUIDELINES

9. Clear SOPs and guidelines should be developed specifically for online homemade food producers.
Saya menyampaikan maklumat keselamatan makanan dengan jelas kepada pelanggan saya (cth: penyimpanan, tarikh luput).

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

10. Enforcement mechanisms (e.g., inspections, digital reporting) are feasible for informal food business.
Mekanisme penguatkuasaan adalah realistik untuk perniagaan makanan tidak formal.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

11. Education and awareness are more effective than punishment in improving food safety practices.
Pendidikan dan kesedaran lebih berkesan daripada hukuman dalam meningkatkan amalan keselamatan makanan.

○ Strongly Disagree ○ Disagree ○ Neutral ○ Agree ○ Strongly Agree

PART C : SEMI-STRUCTURED INTERVIEW QUESTIONS

Target Respondents : Food Technologists / Food Safety Officers in Malaysia.

Leadership / Control / Process

1. In your view, what are the main challenges in getting online homemade food producers to register their business?
Pada pandangan anda, apakah cabaran utama bagi memastikan pengusaha makanan buatan sendiri secara atas talian mendaftarkan perniagaan mereka.

2. What strategies or incentives could be introduced to encourage registration among informal or home-based food producers / sellers?
Apakah strategi atau insentif yang boleh diperkenalkan untuk menggalakkan pendaftaran dalam kalangan pengusaha atau penjual makanan

3. How can digital support (e.g., Grab, Shopee, Facebook) collaborate with authorities to support traceability and registration?
Bagaimanakah platform digital (Cth : Grab, Shopee, Facebook) boleh bekerjasama dengan pihak berkuasa untuk menyokong kebolehkesanan dan pendaftaran?

4. What role should local councils or health departments play in monitoring unregistered food businesses?
Apakah peranan yang perlu dimainkan oleh pihak berkuasa tempatan atau jabatan kesihatan dalam memantau perniagaan makanan yang tidak berdaftar?

Co-operation

1. Based on your experience, how do food safety practices among online homemade food producers differ from those in formal food businesses?

Berdasarkan pengalaman anda, bagaimana amalan keselamatan makanan dalam kalangan pengeluar makanan buatan sendiri atas talian berbeza daripada perniagaan makanan formal?

2. What are the most common food safety risks you observe in home-based food production?
   Apakah risiko keselamatan makanan yang paling biasa anda perhatikan dalam pengeluaran makanan buatan sendiri.

3. How can food safety officers effectively monitor or assess hygiene practices in informal or home settings?
   Bagaimanakah pegawai keselamatan makanan boleh memantau atau menilai amalan kebersihan secara berkesan dalam persekitaran tidak formal atau rumah?

4. Are there any existing tools or frameworks that can be adapted for use in the homemade food sector?
   Adakah terdapat sebarang alatan atau rangka kerja sedia ada yang boleh disesuaikan untuk digunakan dalam sektor makanan buatan sendiri.

Communication

1. What kind of SOPs or guidelines would be most relevant for online homemade food producers?
   Apakah jenis SOP atau garis panduan yang paling relevan untuk pengeluar makanan buatan sendiri secara atas talian?

2. How can these guidelines be communicated effectively to informal food producers / sellers, especially those without formal training?
   Bagaimanakah garis panduan ini boleh disampaikan dengan berkesan kepada penjual makanan tidak formal, terutamanya yang tidak mempunyai latihan formal?

3. What enforcement mechanisms (e.g., inspections, digital reporting, platform-based compliance) could be realistically applied to this sector?
   Apakah mekanisme penguatkuasaan (cth : pemeriksaan, laporan digital, pematuhan berasaskan platform) yang boleh dilaksanakan secara realistik dalam sektor ini.

4. How can food safety officers balance education and enforcement when dealing with informal food producers?
   Bagaimanakah pegawai keselamatan makanan boleh menyeimbangkan antara pendidikan dan penguatkuasaan apabila berurusan dengan pengeluar makanan tidak formal.

Competent

1. What role should government agencies, NGOs, and private platforms play in governing food safety in the online homemade food sector?
   Apakah peranan yang perlu dimainkan oleh agensi kerajaan, NGO dan platform swasta dalama mentadbir keselamatan makanan dalam sektor makanan buatan sendiri secara atas talian.

2. How can inter-agency collaboration be improved to support safer food practices among home-based producers?
   Bagaimanakah kerjasama antara agensi boleh dipertingkatkan untuk menyokong amalan makanan yang lebih selamat dalam kalangan pengeluar makanan buatan sendiri.

3. What policy recommendations would you suggest to improve food safety governance in this growing sector?
   Apakah cadangan polisi yang anda syorkan untuk memperbaiki tadbir urus keselamatan makanan dalam sektor yang sedang berkembang ini.

Concluding Questions

1. Is there anything else you would like to share regarding the governance of food safety / food safety culture among online homemade food producers in Malaysia.
   Adakah perkara lain yang anda ingin kongsikan berkaitan tadbir urus keselamatan makanan dalam kalangan pengeluar makanan buatan sendiri secara atas talian di Malaysia?

Thank you for your time and participation.
Terima kasih atas kesudian anda meluangkan masa dan menyertai kajian ini.

Appendix 8.7 *Mapping of Research Objectives (RO) to Interview Instruments*

RO KEY :

RO1 – STRATEGIES TO ENSURE ONLINE HOMEMADE FOOD PRODUCERS REGISTER THEIR BUSINESS FOR TRACEABILITY

RO2 – FOOD PREPARATION PROCESSES AND FOOD SAFETY STANDARDS USED

RO3 – STRATEGIES OR POLICIES TO IMPOSE SOPS AND GUIDELINES

Food Safety Governance Dimension	Interview Question	Linked Research Objective(s)	Rationale / Purpose
Governance Leadership / Control / Process	What are the main challenges in getting online homemade food producers to register their business?	RO1	This dimension explores governance, leadership, and control from a regulatory and enforcement perspective. Food technologists play a critical role in shaping compliance behaviour, monitoring informal food businesses, and designing mechanisms to improve traceability and accountability in online homemade food production. The questions focus on barriers to registration, the role of digital platforms, inter-agency responsibilities, and practical monitoring strategies. These insights support understanding how formal governance systems interact with informal food economies.
	What strategies or incentives could encourage registration among informal or home-based food producers?	RO1, RO3	
	How can digital platforms (e.g., Grab, Shopee, Facebook) collaborate with authorities to support traceability and registration?	RO1	
	What role should local councils or health departments play in monitoring unregistered food businesses?	RO1, RO3	
Co-operation	How do food safety practices among online homemade food producers differ from those in formal food businesses?	RO2	This dimension examines cooperation between regulators and homemade food producers, focusing on observed practices, risks, and monitoring challenges. It recognises that effective
	What are the most common food safety risks observed in home-based food production?	RO2	

	How can food technologists effectively monitor or assess hygiene practices in informal or home settings?	RO2, RO3	food safety governance requires adaptive approaches that consider the constraints of home-based food production. The questions aim to identify differences between formal and informal sectors, common food safety risks, and the feasibility of adapting existing tools or frameworks.
	Are there existing tools or frameworks that could be adapted for the homemade food sector?	RO3	
Communication	What kind of SOPs or guidelines would be most relevant for online homemade food producers?	RO3	This dimension focuses on communication and enforcement mechanisms relevant to informal and digitally mediated food systems. Clear guidelines, effective dissemination, and balanced enforcement are essential to improving compliance without discouraging participation. The questions explore suitable SOPs, communication strategies, enforcement tools, and the balance between education and regulation.
	How can these guidelines be communicated effectively to informal food producers without formal training?	RO3	
	What enforcement mechanisms could realistically be applied to this sector?	RO3	
	How can food technologists balance education and enforcement when dealing with informal producers?	RO3	
Competence	What role should government agencies, NGOs, and private platforms play in governing food safety in this sector?	RO3	This dimension examines system-level competence and governance, focusing on institutional roles and policy coordination. Effective food safety governance in the online homemade food sector requires collaboration across government agencies, NGOs, and private platforms. The questions seek expert perspectives on inter-agency collaboration and policy reforms needed to strengthen food safety governance.
	How can inter-agency collaboration be improved to support safer food practices among home-based producers?	RO3	
	What policy recommendations would improve food safety governance in this growing sector?	RO3	

Appendix 8.8 *Focus Group Discussion Questions*

Welcome and thank you for joining this focus group discussion. Your views are important to help us understand food safety practices and governance in Malaysia. Please feel free to share your honest opinions. There are no right or wrong answers. The session will be audio recorded for research purposes and all responses will remain confidential and anonymous.

Selamat datang dan terima kasih kerana menyertai sesi perbincangan kumpulan focus ini. Pandangan anda sangat penting untuk membantu kami memahami amalan dan tadbir urus keselamatan makanan di Malaysia. Sila kongsi pendapat anda dengan jujur. Tiada jawapan yang betul atau salah. Sesi ini akan dirakam audio untuk tujuan penyelidikan dan semua maklumat akan dirahsiakan serta tidak akan didedahkan secara individu.

Sila jawab soalan berikut sebelum sesi perbincangan kumpulan focus bermula.

1. Name (Optional) / *Nama (Pilihan)*

---

2. Age Range / *Julat Umur :*
   ☐ Under 18 / *Bawah 18*
   ☐ 18–24
   ☐ 25–34
   ☐ 35–44
   ☐ 45–54
   ☐ 55 and above / *55 ke atas*

3. Gender / Jantina
   ☐ Male / *Lelaki*
   ☐ Female / *Perempuan*
   ☐ Prefer not to say / *Lebih suka tidak nyatakan*

4. State of Residence or Work / *Negeri tempat tinggal atau bekerja:*

---

5. Role / Peranan :
   ☐ Homemade Food Producer / *Pengeluar Makanan Buatan Sendiri*
   ☐ Food Technologist / *Ahli Teknologi Makanan*
   ☐ Food Safety Officer / *Pegawai Keselamatan Makanan*
   ☐ Other (please specify) / *Lain-lain (sila nyatakan):* _____

6. Years of experience in food business or food safety / *Tahun pengalaman dalam perniagaan makanan atau keselamatan makanan.*

☐ Less than 1 year / *Kurang dari setahun*
☐ 1–3 years / *1–3 tahun*
☐ 4–5 years / *4–5 tahun*
☐ 6–10 years / *6–10 tahun*
☐ More than 10 years / *Lebih dari 10 tahun*

Focus Group Questions

1. What do you see as the main challenges in ensuring food safety among online homemade food businesses in Malaysia?
   Apakah cabaran utama yang anda lihat dalam memastikan keselamatan makanan dalam perniagaan makanan sediaan di rumah secara atas talian di Malaysia?
2. How effective do you think current food safety guidelines and policies are for homemade food producers, and what improvements would you suggest?
   Pada pendapat anda, sejauh mana keberkesanan garis panduan dan polisi keselamatan makanan sedia ada untuk pengeluar makanan sediaan di rumah, dan apakah penambahbaikan yang anda cadangkan?
3. What role should digital platforms (e.g., Grab, Shopee, Facebook) and authorities play in supporting food safety and business registration for homemade food producers?
   Apakah peranan yang perlu dimainkan oleh platform digital (contohnya Grab, Shopee, Facebook) dan pihak berkuasa dalam menyokong keselamatan makanan dan pendaftaran perniagaan bagi pengeluar makanan sediaan di rumah?
4. What types of support, training, or resources would help improve food safety practices among homemade food producers?
   Apakah jenis sokongan, latihan, atau sumber yang dapat membantu meningkatkan amalan keselamatan makanan dalam kalangan pengeluar makanan sediaan di rumah?
5. How can communication and cooperation between homemade food producers and food safety officers/technologists be strengthened to improve food safety outcomes?
   Bagaimanakah komunikasi dan kerjasama antara pengeluar makanan sediaan di rumah dan pegawai/ahli teknologi keselamatan makanan dapat diperkukuhkan untuk meningkatkan hasil keselamatan makanan?

Thank you for your time and participation.
Terima kasih atas kesudian anda meluangkan masa dan menyertai kajian ini.

Appendix 8.9 *Themes and Sub-Themes Developed from the Focus Group Discussions*

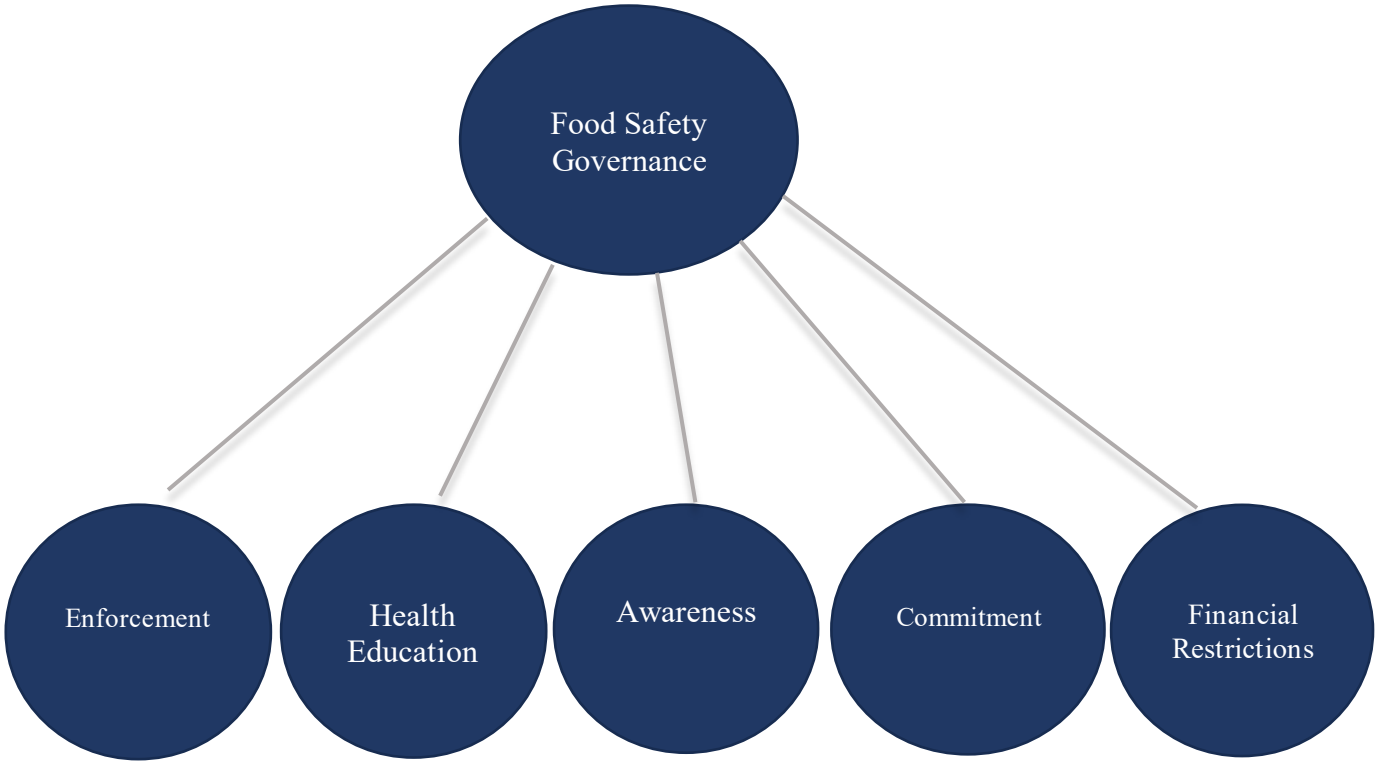


Figure 1 : Food safety governance - 5 themes were developed.

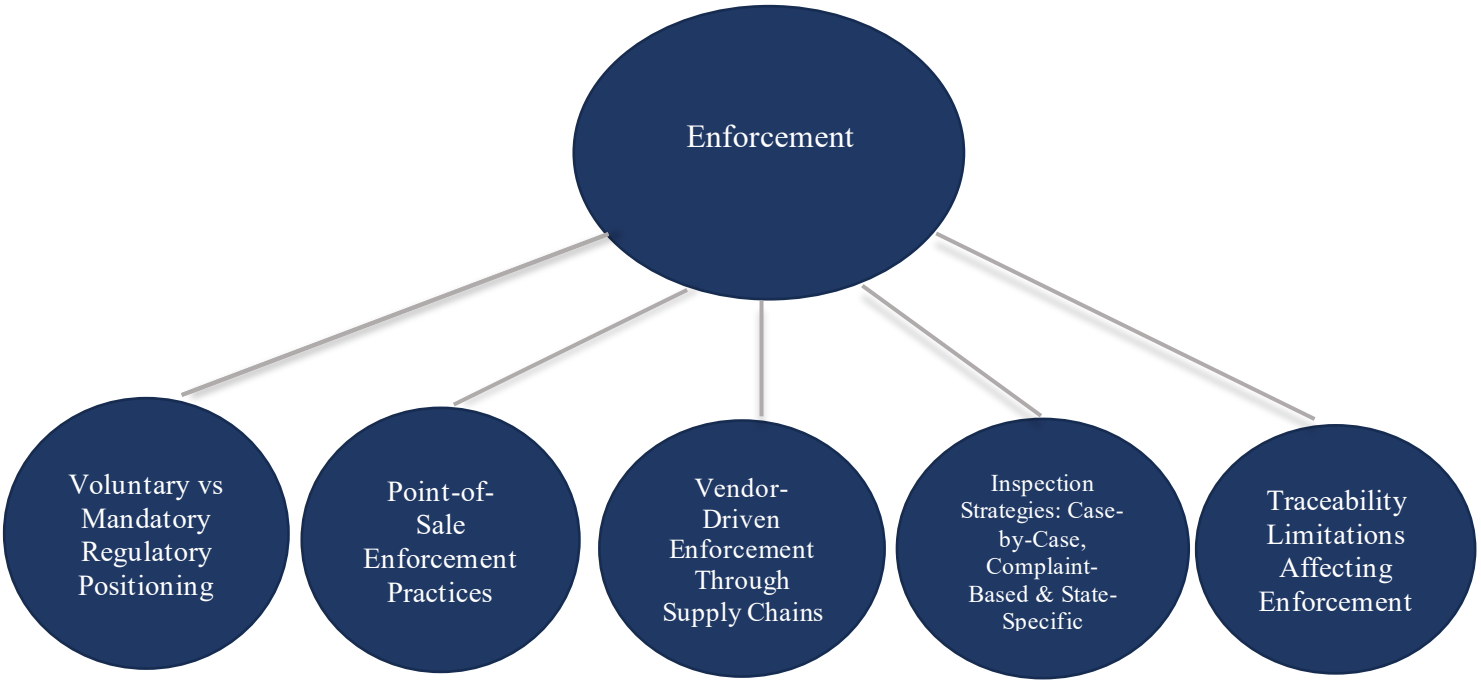


Figure 2 : Enforcement – 5 sub-themes were developed.

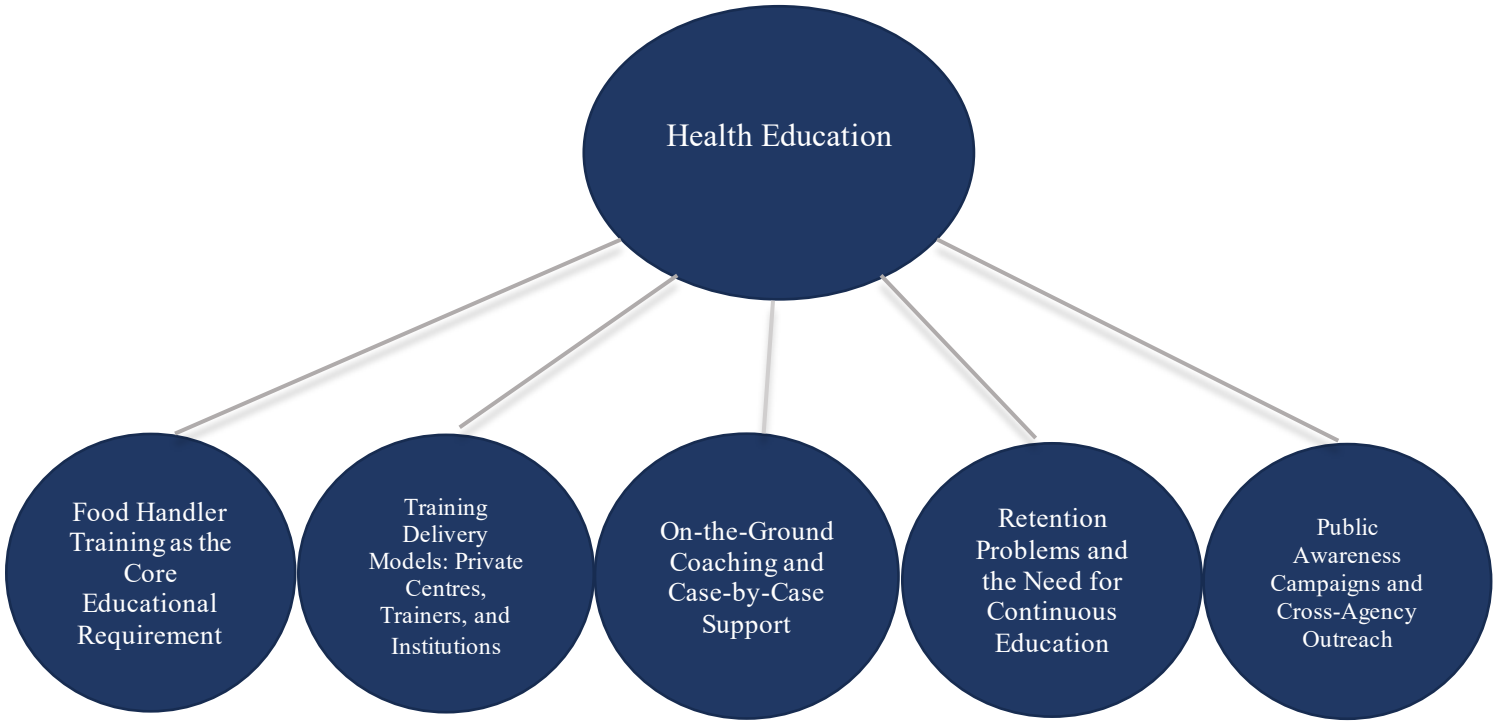


Figure 3 : Health Education – 5 sub-themes were developed.

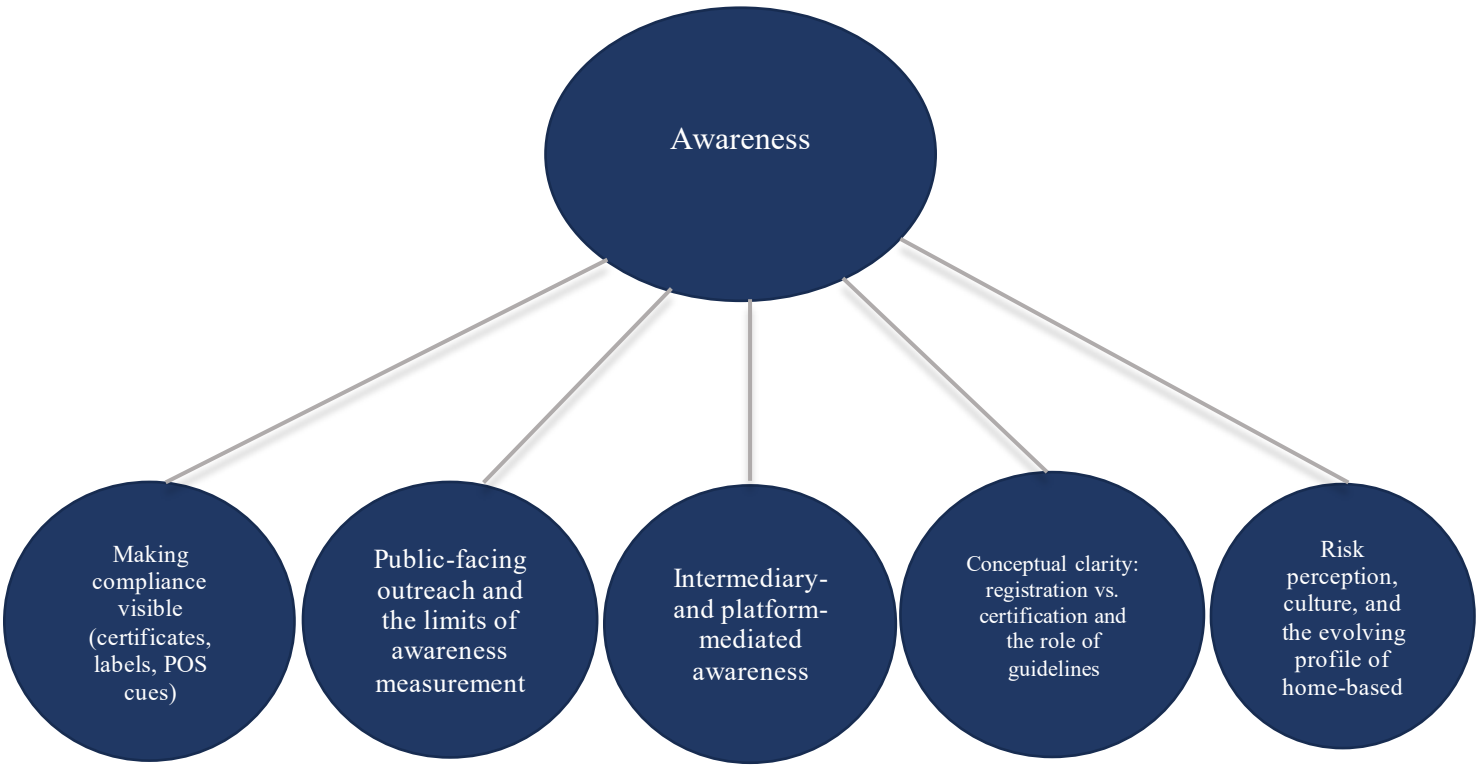


Figure 4 : Awareness – 5 sub-themes were developed.



Figure 5 : Commitment– 5 sub-themes were developed.

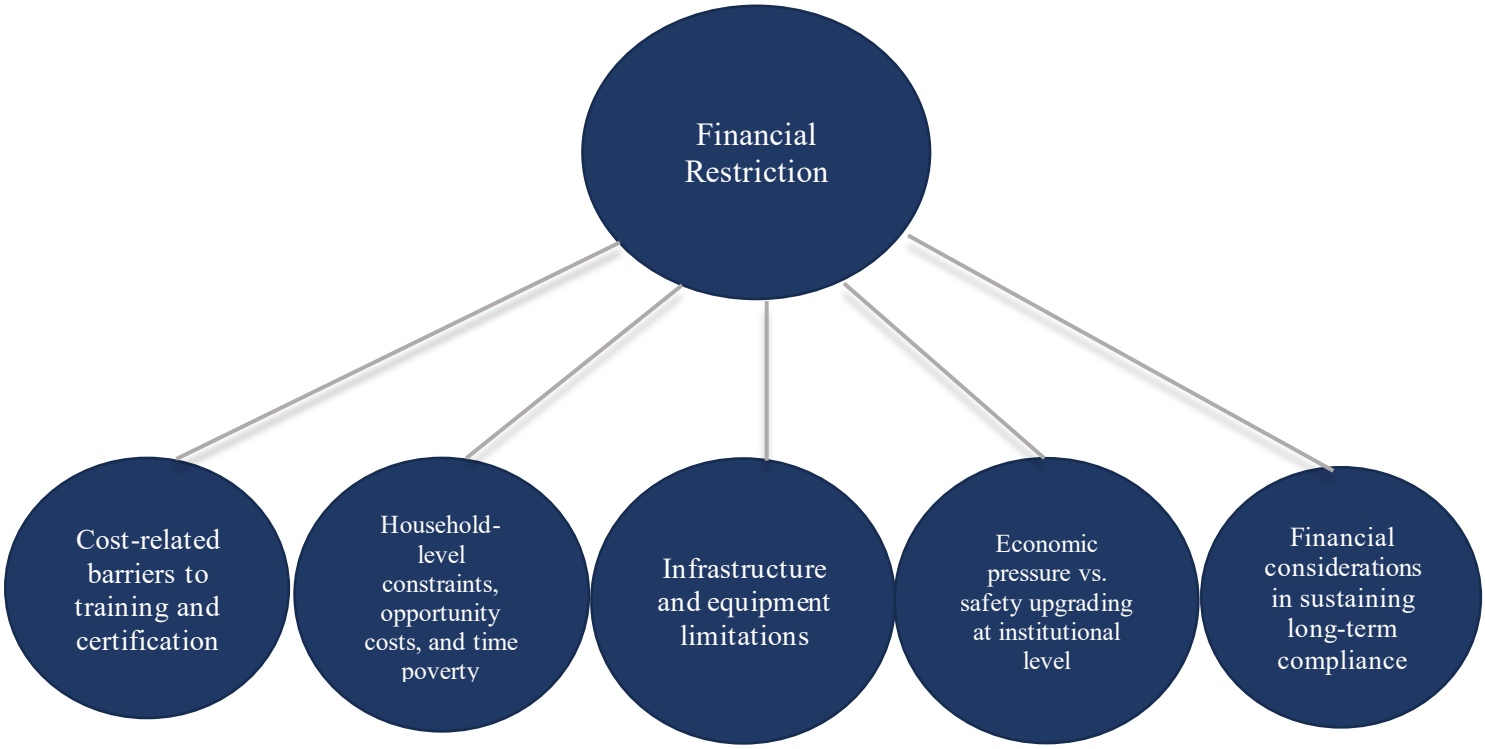


Figure 6 : Financial Restriction – 5 sub-themes were developed.

Appendix 8.10 *Mapping of Focus Group Interview Questions*

RESEARCH OBJECTIVES (RO) KEY

RO1 – STRATEGIES TO ENSURE ONLINE HOMEMADE FOOD PRODUCERS REGISTER THEIR BUSINESS FOR TRACEABILITY
RO2 – FOOD PREPARATION PROCESSES AND FOOD SAFETY STANDARDS USED
RO3 – STRATEGIES OR POLICIES TO IMPOSE SOPS AND GUIDELINES

Food Safety Governance Dimension	Interview Question	Linked Research Objective(s)	Rationale / Purpose
Governance / Leadership / Control / Process	What do you see as the main challenges in ensuring food safety among online homemade food businesses in Malaysia?	RO1, RO2	This dimension explores governance, leadership, and control within the online homemade food sector from a systemic and regulatory perspective. It focuses on how food safety oversight, registration, and traceability are influenced by the informal nature of home-based food businesses. The questions under this dimension aim to identify structural and regulatory challenges, gaps in current governance arrangements, and the extent to which existing policies are effective in addressing food safety risks in informal online food operations.
	How effective do you think current food safety guidelines and policies are for homemade food producers, and what improvements would you suggest?	RO3	
	What role should digital platforms (e.g., Grab, Shopee, Facebook) and authorities play in supporting food safety and business registration for homemade food producers?	RO1, RO3	
Co-operation	What types of support, training, or resources would help improve food safety practices among homemade food producers?	RO2, RO3	This dimension examines cooperation between homemade food producers, regulators, and supporting institutions, with particular attention to capacity-building and shared responsibility. It recognises that effective food

			safety governance in informal settings relies on collaborative approaches rather than enforcement alone. The question seeks to identify practical forms of support, training, and resources that could strengthen food safety practices and encourage compliance among home-based producers.
Communication	How can communication and cooperation between homemade food producers and food technologists be strengthened to improve food safety outcomes?	RO2, RO3	This dimension focuses on communication and relational aspects of food safety governance. Effective communication and cooperation between producers and authorities are essential for translating guidelines into practice and fostering trust in informal food systems. The question explores how improved dialogue, engagement, and collaborative relationships can enhance food safety outcomes and support more effective governance.

Appendix 8.11 *Project Maps (Parent-Child) – A combined version with all themes in a single thematic map figure for Interview Analysis*



Figure 1 : Food safety governance - 8 themes were developed.

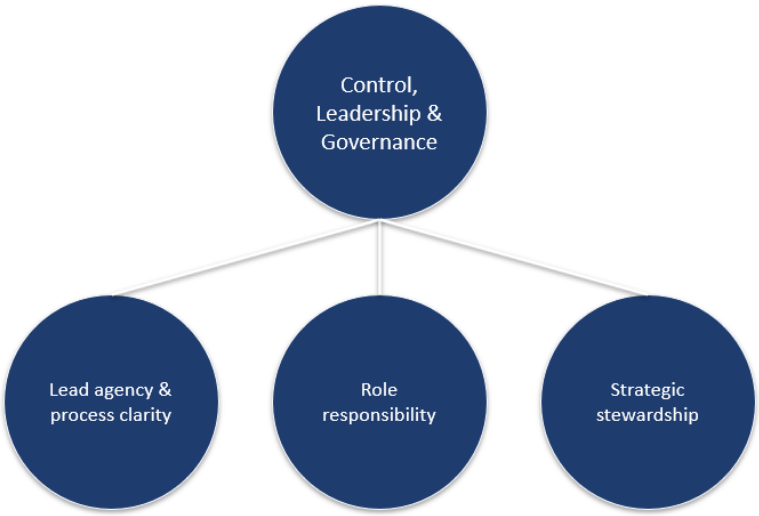


Figure 2 : Control, leadership & governance – 3 sub-themes were developed.

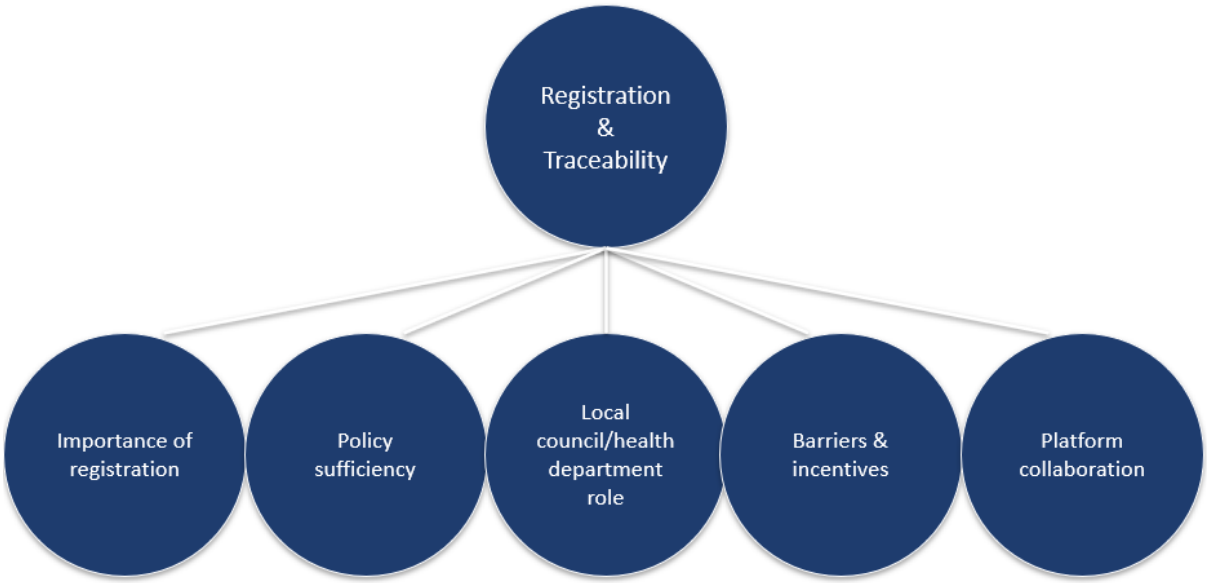


Figure 3 : Registration & Traceability – 5 sub-themes were developed.

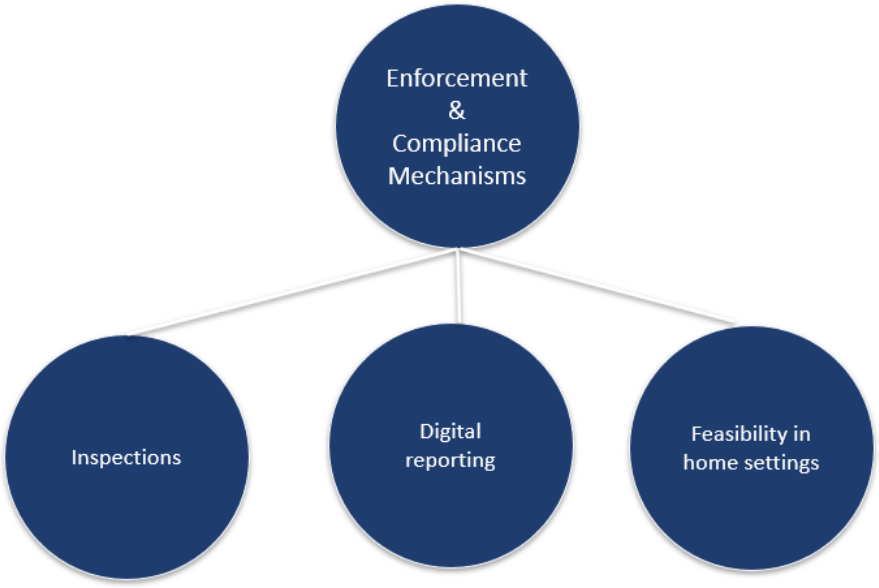


Figure 4 : Registration & Traceability – 3 sub-themes were developed.

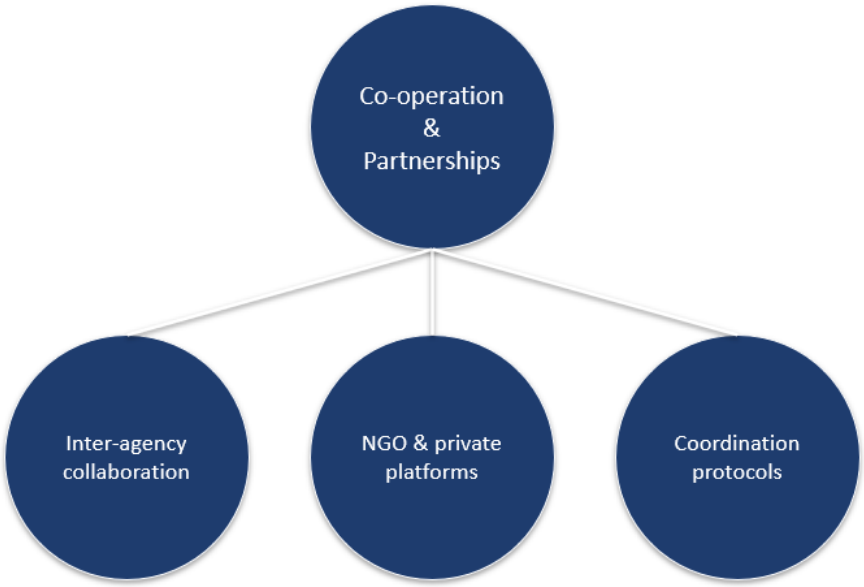


Figure 5 : Co-operation & Partnership – 3 sub-themes were developed.

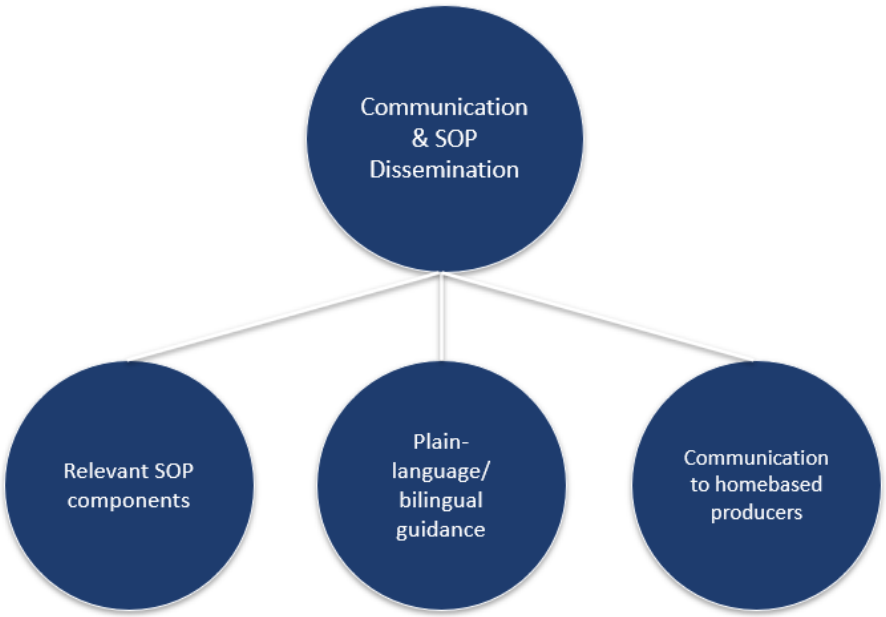


Figure 6 : Communication & SOP Dissemination – 3 sub-themes were developed.

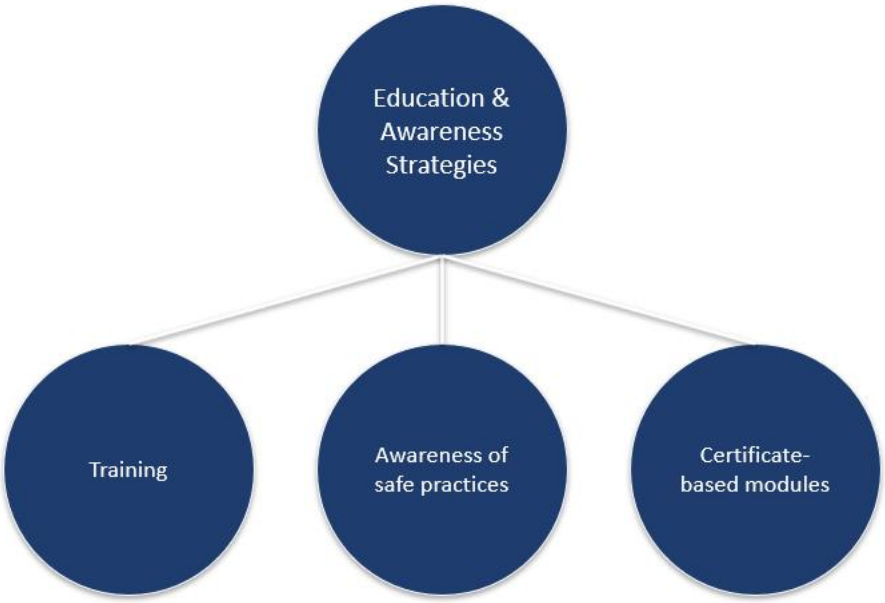


Figure 7 : Education and Awareness Strategy – 3 sub-themes were developed.

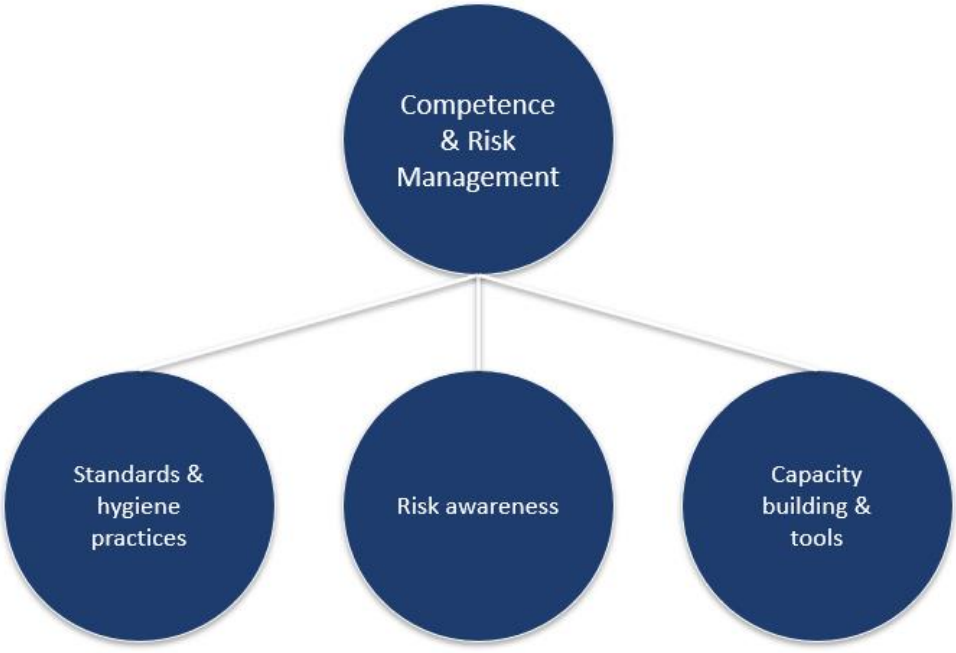


Figure 8 : Competence & Risk Management – 3 sub-themes were developed.



Figure 9 : Food Safety Governance & Continuous Improvement – 3 sub-themes were developed.