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The exotopia food safety cultural conundrum: A case study of a UK fish high-risk processing company

Derek Watson, Shingai P. Nyarugwe, Robert Hogg, Chris Griffith, Pieterneel A. Luning, Sophia Pandi



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**Author contributions:**

**Derek Watson**<sup>a\*</sup> : Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Supervision; Resources; Software; Visualization; Validation; Roles/Writing - original draft; Writing - review & editing.

**Shingai P. Nyarugwe**<sup>b</sup> : Formal analysis; Project administration; Supervision; Visualization; Validation; Writing - review & editing.

**Robert Hogg**<sup>c</sup> : Formal analysis; Funding acquisition; Methodology; Software; Visualization; Writing - review & editing.

**Chris Griffith**<sup>d</sup> : Formal analysis; Validation; Writing - review & editing.

**Pieter A. Luning**<sup>e</sup> : Writing - review & editing.

**Sophia Pandi**<sup>a</sup> : Investigation; Methodology.

1 **The Exotropia Food Safety Cultural Conundrum: A Case Study of a UK Fish**  
2 **High-Risk Processing Company**

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3

4 *Derek Watson<sup>a\*</sup>, Shingai P. Nyarugwe<sup>b</sup>, Robert Hogg<sup>c</sup>, Chris Griffith<sup>d</sup>, Pieter A.*  
5 *Luning<sup>e</sup>, Sophia Pandi<sup>a</sup>*

6

7 *<sup>a</sup> Sunderland Business School, University of Sunderland, UK, Reg Vardy Centre, St*  
8 *Peter's, Sunderland, SR6 0DD, UK*

9 *<sup>b</sup> Food Integrity Africa, 80 Mutare Road, Msasa, Harare, Zimbabwe*

10 *<sup>c</sup> Sport Sciences Team, University of Sunderland, UK, Faculty of Applied Sciences,*  
11 *Darwin Building, City Campus, Chester Road SR1 3SD, UK*

12 *<sup>d</sup> Emeritus Professor, Cardiff Metropolitan University, Western Avenue, Cardiff, CF5*  
13 *2YB, UK*

14 *<sup>e</sup> Food Quality and Design Group, Department of Agrotechnology and Food Sciences,*  
15 *Wageningen University, P.O. Box 17, 6700 AA Wageningen, The Netherlands*

16

17 *\*Corresponding Author ([derek.watson@sunderland.ac.uk](mailto:derek.watson@sunderland.ac.uk))*

18

19 **Abstract**

20 Food safety continues to be a challenge worldwide despite scientific advances,  
21 continuous improvement in food safety management systems and increasing academic  
22 debate on food safety. This paper aims to validate a new model of food safety cultural  
23 compliance to identify the challenges that organisations face in their pursuit of a  
24 positive food safety culture. A mixed-method approach was adopted via the  
25 quantitative analysis of a stage one 'Enlighten Questionnaire' involving 202  
26 respondents using parametric statistics (ANOVA with appropriate Post-Hoc tests and  
27 t-tests). Hochberg's GT2 was used for the Post-Hoc tests due to different group sizes  
28 and appropriate non-parametric tests were also run to confirm these results.  
29 Qualitative analysis of stage two semi-structured interviews totalling 40 participants  
30 and stage three focus groups each consisting of 3 groups of 9 employees equating to  
31 27 participants was utilised. Thematic analysis was adopted to synthesise and cluster  
32 key themes. Our findings identify the misalignment of management and employees in  
33 the pursuit of establishing and embedding a positive food safety culture. Four key

34 themes of the Enlighten Food Safety Culture Model (EFSCM) namely; Control, Co-  
35 operation, Communication and Competence were core cultural factors that could be  
36 used to realign management and employee behaviours to help stimulate a positive  
37 food safety culture.

38

39 **Keywords:**

40 *Food Safety; Food Safety Culture; Cultural Compliance; Enlighten Food Safety*  
41 *Culture Model*

42

### 43 **1. Introduction**

44 Despite scientific advances, continuous improvements associated with food safety  
45 management systems (FSMS) and increasing academic debate, a sobering reality is  
46 that globally 600 million people suffer from foodborne diseases each year (WHO,  
47 2015). In consequence, food safety is firmly in the limelight of governments, the food  
48 industry, and consumers (Ball et al., 2009) as evidenced by a plethora of risk-based  
49 food safety legislation (EC, 2004; FSMA, 2011). Global food manufacturers, in the  
50 main, have responded with revised investment programmes to pursue compliance via  
51 FSMS derived from best practice and structuring their FSMS on pre-requisite  
52 programmes in unison with refined hazard analysis critical control point (HACCP)  
53 initiatives (Tomasevic et al., 2013). Regulators are also embedding revised legislative  
54 principles; notably the revised EC regulation. 2021/382 (EC, 2021) to refine and  
55 enhance FSMS. Likewise standard owners such as the Global Food Safety Initiative  
56 (GFSI, 2019) and the British Retail Consortium's Global Food Standards are auditing  
57 food companies to demonstrate their adherence to such systems (Griffith, 2017a;  
58 BRC, 2018).

59

60 However, existing measures to secure flawless production of safe food have  
61 demonstrated to be insufficient by high profile product recalls and recurring food-  
62 borne outbreaks (Nyarugwe et al., 2016), which shows that FSMS do not always  
63 mirror compliance. A key inhibitor is senior management who often fail to appreciate  
64 that employee behaviour changes, which requires constant and effective monitoring.  
65 Zook and Allen, (2016) suggested that at least 94% of organisational challenges are  
66 attributable to senior management, as they are invariably the gatekeepers or regulators  
67 of resources and instigators of food safety (Herrero et al., 2002). Whilst management

68 places their commitment in food safety (Scallen et al., 2011; Tam et al., 2012), the  
69 stark reality is that their failure to ensure behavioural compliance often results in  
70 procedural breaches and potentially fatal consequences.

71

72 Several authors indicated that food safety behaviour is a key contributory factor in the  
73 pursuit of food safety compliance (De Boeck et al., 2017; Nyarugwe et al. 2018).

74 Griffith, (2017b) suggested that more than 40% per cent of employee behaviour is  
75 influenced by organisational food safety culture. In many cases, executive decision-

76 makers invariably over anticipate the level of employee commitment and

77 underestimate the level of managerial time and effort needed (Bennis, 2009), to

78 cultivate a positive food safety culture. Hence, many food manufacturers

79 inadvertently transform into an exotopia food culture, one in which executives

80 orchestrate their food safety strategy, often failing to appreciate the importance of

81 employee buy-in as a catalyst in the pursuit of a functional food safety culture. The

82 corollary, is a misalignment with the norms and food safety cultural values of their

83 workforce. Thus, the food safety culture conundrum continues to challenge food

84 manufacturers. In consequence, the paper objective is to illustrate, with the aid of the

85 EFSCM, the synthesis of key themes to aid the realignment of an exotopia food

86 safety culture, utilizing one of Europe's largest high-risk fish food processing

87 organisations based in the United Kingdom.

88

## 89 **2. Culture and the Enlighten Food Safety Culture Model**

90 Table 1 shows the Enlighten Food Safety Culture Model (EFSCM) adapted from

91 Watson et al. (2018a) used to aid the synthesis of key themes in the realignment of an

92 exotopia food culture. It's choice for selection is that the EFSCM differentiates itself

93 from other food safety culture models as it focuses on assessing exotopia food

94 cultures, thus contributing to the academic debate, existing validated scales of food

95 safety and food manufacturers' cultural insights. Hence the development of this

96 model was based on the notion that if outside the 'angle of view' (Yewon et al.,

97 2017), an organisation's food safety culture will manifest its own identity (Ades et al.,

98 2016), which takes a wakeup call in the form of a major non-compliance for

99 organisations to realise their food safety policy, procedures and culture are in need of

100 recalibration. This is often attributable to the fact that their employees' behaviours

101 have incrementally drifted from their aligned food safety strategy, hence, the term  
102 'Exotopia Food Safety Culture'.

103

104 **[Insert Table 1]**

105

106 The model highlights four key themes namely; Control, Co-operation,  
107 Communication and Competence, which were thematically synthesised following  
108 consultation with clusters of 30 UK food manufacturers, comprising of both senior  
109 management and a cross section of employees, two leading certification bodies and a  
110 major food safety consultancy practice. Each theme focuses on four core elements and  
111 the respective indicators of an aspired food safety culture.

112

113 *Control* is instrumental in the alignment of an organisation's food safety culture and  
114 in the coordination of operating procedures that influence food safety (Griffith et al.,  
115 2017a). Strategy, leadership, process and change are considered the indicators of  
116 control. Strategy signals the organisation's commitments and priorities on food safety  
117 culture (GFSI, 2018, PWC, 2018). Developing an organisation's strategy and  
118 processes with the involvement of employees is critical to foster willing participation  
119 of control systems (Brinke and Keltner, 2020). Effective leadership is essential in  
120 controlling and nurturing its food safety culture (Zin and Ismail, 2012) as  
121 organizations with better leaders are more productive and responsive (Griffith et al.,  
122 2010). Furthermore, organisations have a memory and it is important to reflect and  
123 learn off past behavioural change failures, before embarking on new change  
124 initiatives (Evans, 2020).

125

126 *Co-operation* is key in the alignment of an organisation's food safety culture through  
127 embedding responsibility and empowering individuals to actively participate in co-  
128 operation initiatives, such as functional management-team dynamics (Basterretxea et  
129 al. 2019). With co-operation, we measure responsibility, empowerment, teams and  
130 recognition. De Boeck et al. (2017) suggested a correlation between responsible  
131 employee behaviour and effective food safety compliance, both of which are affiliated  
132 to employee co-operation. Taylor, (2011) acknowledges that organisations need to  
133 foster a culture which requires management to continually empower the workforce, so  
134 that they feel that their behaviour and opinions are valued (Ades et al., 2016).

135 Moreover, motivational strategies such as incentives ranging from challenging and  
136 interesting roles to financial recognition are a viable tonic (Watson et al., 2018a).

137

138 Good *communication* plays an undeniable role in sustaining an organisation's food  
139 safety culture as it ensures the company's food safety strategy and vision are  
140 understood by all organisational members, and ensures consistency i.e., alignment of  
141 food safety priorities with resources, processes, people and technology (GFSI, 2018).

142 Lack of consistency between organisational levels i.e., existence of subcultures  
143 reflects the importance of communication (Slijepčević et al. 2018), in terms of clarity  
144 and transparency of the organisation's vision and norms. Accurate information and  
145 360° feedback also influence an organisation's productivity (Holzwarth et al. 2020).

146 The *competence* of all employees can also be considered the fulcrum in the pursuit of  
147 a positive food safety culture. Evidence suggests that training and development are an  
148 antecedent to favourable attitudes and behaviours (Da Cunha et al., 2014). A key  
149 catalyst to direct and infuse employee commitment is through effective appraisal  
150 systems (Cappelli, 2018), which actively synthesise accurate training and  
151 development needs. Employees also need to feel self-belief that their ability and  
152 contribution is valued (Ko, 2015) and without it, their potential and employee  
153 convergence of efforts will always be mired.

154

### 155 **3. Methodology**

#### 156 **3.1 Selection of Participants**

##### 157 *Characteristics of the selected company*

158 Having gained University ethics, company and notably employee approval for the  
159 research study, the company sourced is a major European high-risk fish processing  
160 company based in the UK, as it volunteered to participate in the study. Its annual  
161 turnover is more than £117 million and employs over 700 multi-national employees.  
162 Its main products are cold smoked, hot smoked, ready to eat and natural salmon,  
163 including other fish species products. Its principal customers are the UK supermarkets  
164 but also export to the Far East. The company is audited to British Retail Consortiums  
165 Global Standards and has attained a double AA standard and as such would be an  
166 appropriate case study to implement the EFSCM. Furthermore, the company has  
167 successfully achieved a series of quality awards such as the 'Queens Award for

168 Enterprise and International Trade’ and the ‘International Food Drink Health & Safety  
169 Award’.

170

#### 171 *Characteristics of respondents*

172 All employees were invited to participate in the study through an awareness email  
173 detailing the purpose of research, which was further relayed to staff via two site  
174 awareness visits by the lead author and notice board communications. The selection  
175 of respondents was based on their willingness to participate in the study and therefore  
176 followed a convenience sampling approach (Bujang et al., 2012). 208 respondents  
177 volunteered to participate in the study and included a cross-section of employees from  
178 senior management to operations. They consisted of 7 different nationalities, both  
179 male and female, and durations of employment from 2 months to 27 years (see table  
180 2).

181

182 **[Insert Table 2]**

183

#### 184 *Design of the empirical study*

185 Utilising the ‘EFSCM’ (Watson et al, 2018b), a mixed-methods case study approach,  
186 which involved triangulation of research methods, was implemented as recommended  
187 in other studies (Jespersen et al., 2016; De Boeck et al., 2019; Nyarugwe et al., 2020),  
188 thus, endeavouring to robustly validate the research findings. The mixed methods case  
189 study design utilises quantitative and qualitative data collection, and integrates results,  
190 to provide in-depth evidence for a case(s) (Creswell & Plano Clarke, 2018).

191

192 Stage 1 involved a quantitative analysis of the ‘Enlighten Questionnaire’. Both  
193 management and employees were encouraged to participate. Participants were assured  
194 of anonymity and of the initial volunteers, 208 were willing to participate in the study  
195 and completed the online questionnaire; after removing incomplete surveys, a final  
196 sample of 202 remained that was used in the data analysis. A breakdown of general  
197 staffing groups within the company is outlined in table 2.

198

199 To reinforce the validation of the data stages 2 and 3 included a qualitative analysis,  
200 which involved 40 willing participants from stage 1 and the wider workforce and  
201 focus groups each consisting of 3 groups of 9 employees equating to 27 participants,

202 respectively and were a combination of volunteers from both stage 1 and 2 (see table  
203 2).

204

### 205 **3.2 Data Collection**

#### 206 *Questionnaire (Stage 1)*

207 The Enlighten Food Safety Culture questionnaire (see supplementary material stage  
208 1) was designed based on the EFSCM to collect online anonymised data from  
209 participants, and comprised six sections. The first section was used to gather basic  
210 demographic data (e.g., work location, nationality and position within the company)  
211 which has been filtered to ensure anonymity. The intermediate four sections targeted  
212 each of the four key areas of the Food Safety Culture research model: Control (17  
213 questions), Cooperation (8 questions), Communication (10 questions) and  
214 Competence (13 questions). These provided the four sub-scales in the final analysis of  
215 the questionnaire. Each of the questions was answered using a standard 5-point Likert  
216 scale (Likert, 1932) ranging from Strongly Disagree to Strongly Agree (1 – 5), with  
217 an appropriate iconic image supporting the scale and was assumed to correspond to a  
218 linear decision scale for parametric analysis. In completing the questionnaire,  
219 instructions guided participants to consider the scale to be linear between the two  
220 extremes, thus, allowing for supportive arguments in using parametric analysis of  
221 individual questions as well as sub-scales. The final section included general  
222 comment sections that further provided the opportunity to target qualitative  
223 questioning in one-to-one interviews and focus groups.

224

#### 225 *Interviews (Stage 2)*

226 Data extracted from the questionnaires aided in the design of 13 semi-structured  
227 interview questions on the four key areas: Control, Cooperation, Communications and  
228 Competence. Three questions each from the four key areas were used for the  
229 interviews and an additional concluding question was asked to elicit respondent to  
230 give additional information (Supplementary materials stage 2). A total of 40 one to  
231 one interviews (table 2), were recorded, each lasting approximately 30 minutes.

232

#### 233 *Focus Groups (Stage 3)*

234 The feedback synthesised from stage 2 interview transcripts was used to inform the  
235 design of 5 semi structured focus group questions (see supplementary materials stage

236 3). Each of the three focus groups were asked to discuss each of the 5 questions and  
237 to feedback back via flip chart notes and group dialogue, lasting 2 hours.

238

### 239 **3.3 Data Analysis**

240 Participants' responses to the survey items measuring the four food safety culture  
241 factors: Control (17 items), Co-Operation (8 items), Communication (10 items) and  
242 Competence (13 items) were assessed for internal consistency using Cronbach's  
243 Alpha (Cronbach 1951) and were found to be either Excellent or Good (See Table 3).  
244 The suitability of these responses for averaging to a single component was confirmed  
245 using Principal Component Analysis (PCA) and Parallel Analysis (PA). Parallel  
246 Analysis (PA) was the preferred approach for deciding how many variables to extract  
247 as it is based on a bootstrapping approach rather than an arbitrary numerical or  
248 graphical approach. Using this method, only the items that the initial eigen values are  
249 greater than the 95th percentile of the randomly determined eigen values should be  
250 retained (Longman et al., 1989).

251

252 **[Insert Table 3]**

253

254

255 As part of the PCA, Kaiser Meyer Olkin (KMO) (Kaiser 1974) was used to determine  
256 the adequacy of sampling, while Bartlett's test of sphericity assessed the strength of  
257 the relationship between variables (Bartlett, 1954). The KMO values between 0.8 and  
258 0.9 are considered good, and a value greater than 0.9 is considered excellent (Kaiser  
259 1974; Hutcheson & Sofroniou, 1999). Additionally, Bartlett's test of sphericity was  
260 used to determine the variables' homogeneity and assess if variances are equal across  
261 all samples. The p-values all being less than 0.05 indicate the data is for further  
262 investigation (Field, 2000).

263

264 Based on this suitability for factor reduction, prior to quantitative analysis, this data  
265 was then averaged to produce a single score for each of the four components. These  
266 scores were then used as the basis for comparisons between employee groups.

267 Prior to running statistical comparison between the employee groups, it was important  
268 to note the different sizes of these groups. As such, suitable statistical tests robust to  
269 this variation in group size were chosen, and a decision was made to run a parallel

270 non-parametric analysis to the more statistically powerful parametric analysis to  
271 confirm results.

272

273 The raw data from interviews (stage 2) and focus groups (stage 3) was manually  
274 transcribed and thematically coded, analysed and clustered under the EFSCM 4 sub-  
275 scales. Thematic analysis was used as it is an appropriate qualitative method used to  
276 identify, analyse, organise, describe and report themes within a dataset (Nowell et al.,  
277 2017).

278

279 When analysing the data from the EFSCM questionnaire, the four sub-scales i.e.,  
280 Control, Co-operation, Communication and Competence were normalised (due to the  
281 unequal sizes) before statistical analysis and data visualisation was carried out, so  
282 direct comparisons could be made (see Figure 1 A-D). For each component, tests for  
283 Homogeneity of Variances were carried out before parametric statistics (ANOVA  
284 with appropriate Post-Hoc tests and t-tests) were calculated and were carried out,  
285 based on the nature of the data. Hochberg's GT2 (Ijsmi, Editor, 2016) was used for  
286 the Post-Hoc tests given its robustness to groups of unequal sets (see table 2). Also,  
287 the equivalent non-parametric test (Kruskal Wallis, 1952) was used to cross-check the  
288 results of the parametric analysis. In all cases, Alpha was set at the 0.05 level.

289

#### 290 **4. Results and Discussion**

291 This research sought with the aid of the EFSCM, to synthesise of key themes to aid  
292 the realignment of an exotopia food culture. In the pursuit of establishing and  
293 embedding a positive food safety culture, core cultural factors namely; Control, Co-  
294 operation, Communication and Competence were applied resulting in the  
295 identification of challenges in food safety cultural compliance via the alignment of  
296 management and employees. Considering each of these factors independently,  
297 appropriate assumptions were tested using parametric analysis to look for differences  
298 between staffing groups and found to be satisfied, and a summary of the findings are  
299 presented in Table 4, which are used as the basis of comparisons between these  
300 findings. The integrated results of the interviews and focus groups are described in the  
301 following sub-sections.

302

303

**[Insert Table 4]**

304

305 **4.1 Control**

306 In terms of control, there was supportive evidence indicated in both the interviews  
307 and focus groups, that the company was committed to a positive food safety culture,  
308 by way of its accredited strategy and eminent national and European awards. In line  
309 with findings by Bust et al. (2014) participants acknowledged that there were  
310 effective systems in place for dealing with ‘reject products’, ‘failed hand swabs’ and  
311 that the introduction of new production technology had improved production planning  
312 in terms of enhanced efficiency in product runs, storage and reduced product spoilage.  
313 However, differences in opinion existed between the Technical/QA group and the  
314 Management/Supervisory groups, and was confirmed by the Hochberg’s GT2 test  
315 ( $p < .01$ ). Graphical analysis of this data suggests that although statistically different,  
316 there is still considerable variability in opinion (as indicated by the dispersion of the  
317 data (Figure 1, A - D). The differences mainly regarded the effectiveness and  
318 management of quality control systems, with specific reference to production  
319 scheduling and batch testing against client specifications. Furthermore, there was  
320 clearly a difference of response perceptions between the quality and technical  
321 divisions in terms of staff adhering to quality checks in contrast to production and  
322 processing teams, who expressed a belief that all staff complied to quality standards:

323

324 *“The challenge we face is that there are inconsistencies in quality compliance with*  
325 *other departments”*, (Interview Respondent).

326

327 *“Quality and technical may have a different view but I can put my hand on my heart*  
328 *and genuinely say that staff do not accept substandard or out of spec products”*,  
329 (Interview respondent).

330

331 **[Insert Figure 1]**

332

333 However, there were repeated concerns expressed in both the interviews and focus  
334 groups stating that operational policies needed review and, in specific cases, a  
335 complete rewrite, as they were deemed not fit for purpose in terms of ensuring  
336 effective control policies and procedures, such as their HR policy, software support  
337 systems:

338

339 *“The HR Policy in need of revision, it’s not consistently applied and is ineffective*  
340 *such as the sickness policy is not consistently applied”*, (Interview Respondent).

341

342 *“Yes, we have the ‘Tyton System’ but if department managers don’t ensure that key*  
343 *managers comply with the new system and bin the old then we are always going to*  
344 *have issues with quality control”*, (Focus Group Response).

345

346 Interviews and focus groups responses also expressed concern that management  
347 rarely visited the factory floor and that interaction with staff was generally non-  
348 existent during the backshift operations. In consequence, as noted by Watson et al.,  
349 (2018b) this resulted in regular non-compliance of procedures, such as internal audits  
350 and quality logs not always being completed on time, planned machine maintenance  
351 and effective use of PPE, for example, breaches in non-use of beard guards. The  
352 consensus of staff, as supported by Yewon et al., (2017) held the view that if  
353 management have a better insight of day-to-day operational control challenges via  
354 effective staff dialogue, they could collectively factor out recurring control problems,  
355 such as timely quality assurance checks, effective clean down protocols, effective  
356 planning between departments, adequate management night shift resourcing, and  
357 effective maintenance regimes:

358

359 *“When production targets require lines to be run until the end of the shift there is*  
360 *often not the time for the quality and technical checks*, (Interview Respondent).

361

362 *“After nightshift, the hygiene team cleaning activities (known as the Fire Brigade)*  
363 *result in employee boots being left wet and in cases filled with cold water”*. Staff are  
364 *having to use excess dry paper towels to compensate for the wet boots. Either way,*  
365 *starting 12 hours shift with wet feed is not right by anyone’s standards”*, (Interview  
366 Respondent).

367

368 *“There are examples of allergy planning systems constraints, for example, the lack of*  
369 *planning between planning, production and the technical teams all resulting in*  
370 *incorrect production run setups, and shorting the customer”*, (Interview Respondent).

371

372 *“There are insufficient management and office workers on-site during backshift*  
373 *operations and generally processes appear to be reactive and often fail to correct*  
374 *previous mistakes. Management is aware of this but no one takes ownership”, (Focus*  
375 *Group Response).*

376

377 *“The company needs to invest in new machinery or, in the short term, implement a*  
378 *more realistic maintenance schedule”, (Focus Group Response).*

379

380 In line with findings by Zin & Ismail (2012), respondents felt that management  
381 constantly changed processes without the advice from the factory floor supervisors  
382 and operatives. Such a scenario was further exacerbated, as there was a perception  
383 that changes to production runs were not shared between departments. Such a  
384 recurring scenario resulted in underachievement of production runs due to line  
385 stoppages, breakdowns in maintenance schedules and increases in product waste and  
386 internal recalls. As acknowledged by Ades et al., (2016) the corollary of the feedback  
387 associated with control, suggested that the absence of management interaction fuelled  
388 the perception of a ‘them and us culture’.

389

390 *“The fast-track solution is for management to engage with the factory floor staff and*  
391 *listen as we can see what’s going on”, (Interview Respondent).*

392

393 *“Because management rarely visit the factory floor, at times they are detached from*  
394 *reality, it’s almost like working in two separate companies”, (Focus Group*  
395 *Response).*

396

#### 397 **4.2 Co-operation**

398 The Hochberg’s GT2 revealed no differences in opinion between the subgroups  
399 ( $p=0.01$ ) as shown in Figure 1(B). In support of effective levels of co-operation,  
400 management held the perception that the organisation had fostered a culture that was  
401 highly reactive to unsafe practices. Management further held the view that food safety  
402 was paramount emphasising that all staff needed to play a part. In their study, De  
403 Boeck, (2017) also highlighted the importance of collective behaviour of management  
404 and employees via a willingness to make the effort through participation.

405 Respondents in the study stated that, in the main, they were collegiate and took

406 responsibility in rejecting products that fell off product lines and HACCP teams were  
407 effective in co-operating with departments. Respondents also made specific reference  
408 to the free bacon bun and coffee from management when the company received a  
409 positive 3<sup>rd</sup> party audit and that staff were generally co-operative and happy, in areas  
410 such as divisional and team camaraderie:

411

412 *“It may not be the best-paid job and we work long hours but life here is better than*  
413 *most”*, (Interview Respondent).

414

415 *“The job is demanding but the banter and working relationships with factory staff is*  
416 *good”*, (Focus Group Response).

417

418 However, there was a perception that respondents felt that management tended to  
419 micro-manage via a culture of instructions that would cascade down from senior  
420 management. Such a system often bypassed the importance of supervisory feedback  
421 and rarely consulted operational staff about their suggestions (Casey et al., 2017).

422 Thus, respondents openly stated that they did not have a voice and felt in part ring-  
423 fenced from feeling a sense of empowerment (Han, 2016). In consequence, as noted  
424 by Hofstede et al., (2010), a subculture had evolved in which staff would follow the  
425 perceived path of least resistance and simply follow instructions, often knowing that  
426 the directive would be prone to a mishap. Key catalysts fostering such a culture can  
427 be attributable to excessive micromanagement and didactic style of management  
428 communication:

429

430 *“Staff are not involved in the development of procedures and work instructions etc.*  
431 *for their area, also there is too much micromanagement at all levels”*, (Interview  
432 Respondent).

433

434 *“It’s a case of management telling supervisors and supervisors tell us, but we don’t*  
435 *get to tell anyone”*, (Focus Group Response).

436

437 As found by Moreaux et al., (2018), there were also frustrations directed at the  
438 running of ‘crews’, i.e., teams. It was felt that recruits were deployed onto production  
439 lines without a sufficient insight of what their role function or division involved and

440 this it was felt, hindered team productivity. In consequence, as acknowledged by  
441 Powell et al., (2011), there were increased spikes of staff pressure to meet targets,  
442 which many staff felt was attributable to rising staff attrition rates and high levels of  
443 sickness. Furthermore, and in support of Yewon et al., (2017), the back shift  
444 respondents expressed the view that due to poor management and operational  
445 planning, their shift was often left to address unresolved issues, such as product short  
446 runs and machine clean downs. Concerns were also directed and referenced by Yu et  
447 al., (2017) at the equity of the factory floor job rotation systems, as there was a  
448 perception that some teams or individuals were excluded from being rotated or  
449 protected from roles they did not relish:

450

451 *“The backshift teams are left with all the unfinished clean downs and we cannot gain*  
452 *access to the factory shop as its always close when we start work”*, (Interview  
453 Respondent).

454

455 *“The wet fish area is the most demanding job, if you are good at it, you are there for*  
456 *life”*, (Focus Group Response).

457

458 Respondents equally exhibited concerns over the recognition systems and felt that  
459 such systems were at best jaded, as they were perceived as being inconsistent, lacked  
460 transparency and had lost their currency to motivate staff and are in keeping with the  
461 views of Ades et al. (2016). Examples of core employee agitators were associated  
462 with zero contacts, attendance monitoring, long service recognition and an  
463 incentivised staff suggestion system:

464

465 *“Zero contract planning was unfair and should be more effectively planned to ensure*  
466 *staff receive regular salaries”*, (Interview Respondent).

467

468 *“There was no recognition of staff who exhibit good attendance and/or long service*  
469 *at Christmas and Easter”*, (Focus Group Response).

470

471 *“There used to be a staff suggestion system but I don't think it's used anymore, come*  
472 *to think about it there's no real reward system that gets the attention of the*  
473 *workforce”*, (Focus Group Response).

474

475 In line with the views of Casey et al., (2017) respondents certainly believed that the  
476 lack of responsibility, empowerment, functional team dynamics and effective  
477 recognition systems nurtured an informal sub-culture in overlooking poor practices  
478 that affected both quality and food safety compliance. Furthermore, specific concern  
479 was raised at a failure to timely correct audit findings and often fuelled by an  
480 ineffective management open door policy:

481

482 *“Internal audit findings are not being closed out by departments, for example, the red*  
483 *(table) and blue (Floor) bucket system for cleaning is not always adhered to”*,  
484 (Interview Respondent).

485

486 *“The open-door policy does not seem to be open and management don’t like being*  
487 *advised especially when they are wrong”*, (Focus Group Response).

488

### 489 **4.3 Communication**

490 Concerning the theme of communication, there were differences in opinions between  
491 the Technical/QA group ((Figure 1 (C) and all other groups (with Management/  
492 Supervisory  $p=.006$ , with Operative  $p=.006$ ), which was exhibited in feedback  
493 extracted via stage 2 interviews and stage three focus groups, in areas such as a failure  
494 to follow work role instructions, QA and technical division lack of insight to the  
495 needs and demands of other divisions. The corollary created a perception that both  
496 QA and the technical had a detrimental elitist reputation:

497

498 *“The challenge we face on a day-to-day basis is that other departments and staff do*  
499 *not always follow instructions and this can cause quality assurance issues”*,  
500 (Interview Respondent).

501

502 *“The QA and technical personnel need to listen and understand that we all need to*  
503 *work as a team and stop acting like they run the place”*, (Interview Respondent).

504

505 *“The QA and technical boys love to try and catch us out. We would be all better off if*  
506 *they took the time out to stop, ask and listen to our feedback, as we know when the*  
507 *problems rest”*, (Focus Group Response).

508

509 *“The QA and technical team think they are above everyone. They rarely ask for*  
510 *feedback and when we give it, it’s rarely acted upon. It always been that type of*  
511 *attitude”*, (Focus Group Response).

512

513 Respondents openly stated that the company value systems are readily observable, via  
514 signature, television screens and noticeably on the floor walks, as it was felt that  
515 employees were generally inclined to look at the floor when walking. Management  
516 was also of the perception that the company had a robust reporting system, productive  
517 daily meetings and a staff suggestion system that was linked to rewards such as high  
518 street vouchers.

519 Whilst respondents described the company culture as a ‘family culture’, they raised  
520 concerns about the effectiveness of communication. Respondents felt unsure and, at  
521 best, dispassionate about the company’s food safety strategy and links to the views of  
522 Yiannas, (2009) concerning the importance of effective communication in building  
523 and maintaining a positive food safety culture. The research also reflected similarities  
524 to the work conducted by Newman and Goode (2019), where a rumour culture had  
525 evolved amongst staff, in consequence to the limited formal lines of communication  
526 and management interaction. Key flaws can be attributable to a general lack of  
527 inclusivity between management and employees and a fragmented subcultures  
528 between management - office personnel and factory floor staff:

529

530 *“Senior Management rarely visit the factory floor/production areas and don’t keep us*  
531 *updated with future plans, strategies and general company information”*, (Interview  
532 Respondent).

533

534 *“There’s a ‘them and us’ culture and different standards between office staff and*  
535 *factory employees and this leads to rumours”*, (Focus Group Response).

536

537 Despite having scheduled formal meetings at the start and end of shifts, as referred to  
538 by Vredenburg, (2002), there was a culture in which respondents felt that the  
539 meetings were one-directional from management and end of shift meetings rarely  
540 happened due to production pressures. There were also communication problems on  
541 the factory floor. Respondents indicated that there were always delays in batch

542 changes, as department managers relied on emails often knowing that supervisors did  
543 not have time to read them during production runs. Furthermore, despite there being a  
544 policy to speak English, this was rarely adhered to and supervisors relied on co-  
545 workers translating instructions as it was considered easier and quicker. Specific  
546 spikes of employee resistance were focused around the planning division lack of  
547 proactive consultation with other divisions', a disregard that staff are to communicate  
548 in English, the importance and adequate resourcing of meetings and to erosion of  
549 effective communication channels:

550

551 *"Everyone knows planning does not speak to production and then it starts problems*  
552 *problem problems"*, (Interview Respondent).

553

554 *"The company policy is to speak English but is not the norm and often overlooked"*,  
555 (Interview Respondent).

556

557 *"Yes, meetings are important, but after a 12-hour shift who wants to hang around and*  
558 *have a meeting"*, (Focus Group Response).

559

560 *"Management and supervisors don't really communicate that well, there is too much*  
561 *firefighting which causes unnecessary pressure and wastage"*, (Focus Group  
562 Response).

563

564 Respondents expressed a lack of clarity concerning reporting procedures and due to  
565 the lack of interaction with management and did not feel comfortable in raising  
566 problems, which was also noted by Yiannas (2009). Furthermore, there was also a  
567 culture which was deprived from capturing and responding to employee feedback.  
568 Furthermore, the irony was that management were endeavouring to introduce  
569 wellbeing services that were destined to failure due to the lack of consultation:

570

571 *"Staff suggestions are often challenged by management to justify their current system*  
572 *and the whole process is not managed consistently"*, (Interview Respondent).

573

574 *"The fact that the company are paying a chiropodist is good but the real problem is*  
575 *the lack of formal communication with the hygiene team to change their clean down*

576 *operations and thus avoid the wet boots at the start of a shift*", (Interview  
577 Respondent).

578

579 *"There's no formal system of informing staff of complaints received or issues arising*  
580 *from taste panels apart from emails on notice boards and who reads them"*, (Focus  
581 Group Response).

582

#### 583 **4.4 Competence**

584 For the Competence subscale, differences (Figure 1(D)) were also seen between the  
585 Technical/QA group and Management/Supervisory  $p=.036$ , and Operative  $p=.04$ ). In  
586 support of staff competence, there was consistent evidence suggesting that staff had a  
587 thorough understanding of Critical Control Points and that all staff received food  
588 safety induction training. However, there were major concerns expressed about both  
589 the quality and duration of staff induction programmes, as new staff, when entering  
590 the factory floor, were vague, apprehensive about their role specification and lacking  
591 in confidence. Such a scenario emphasises the work of Powell et al., (2011) who  
592 stated that every person in an organisation should understand their role in producing  
593 safe food. In consequence to the ineffective staff inductions, supervisors would have  
594 to conduct on the line practical skills training and often compromising quality checks,  
595 team meetings and clean down operations. It was also noted and supported by Yu et  
596 al., (2017), that due to work pressure, staff would be asked to support other teams  
597 which often resulted in staff working outside their skills areas, such as the boning of  
598 fish and labelling. Hakenes & Katolnik, (2017) emphasized the importance and  
599 benefits of a tactically planned job rotation system. One, if carefully managed, can  
600 motivate staff to demonstrate their potential with management and personal feeling of  
601 self-belief. However, respondents expressed general concerns about their ability, due  
602 to a lack of staff inductions:

603

604 *"Staff inductions are too brief and do not include a factory tour/insights of their*  
605 *actual roles, sometimes resulting in new staff walking off the line. The trainers should*  
606 *also spend more time on the factory floor to ensure that their training is fit for*  
607 *purpose"*, (Interview Respondent).

608

609 As highlighted by da Cunha et al., (2014), there was also concern directed at training  
610 schedules and the quality of training and repeat training. For instance, respondents  
611 indicated that there was no formal system in place for delivering food safety and  
612 Hazard Analysis and Critical Control Points (HACCP) refresher training.  
613 Furthermore, it was repeatedly stated that training needed to accurately reflect  
614 operational demands and the importance of working to specification, such as  
615 temperature controls and staff from training and development were rarely seen on the  
616 factory floor:

617

618 *‘There is no formal system in place for delivering food safety and HACCP refresher*  
619 *training. Training needs to place more emphasis understanding the implications of*  
620 *not working to specification, rather than just informing staff of dos and don’ts’*,  
621 (Interview Respondent).

622

623 *“H.R need to spend more time on the factory floor to get a better idea of what*  
624 *training is needed and how effective and relevant their current training is”*, (Focus  
625 Group Response).

626

627 In support of the contributions by Cappelli (2018), there was little confidence in the  
628 companies’ appraisal system as respondents stated that the formal system was in  
629 many cases redundant. Those respondents who had received an appraisal described it  
630 more as a brief chat about operational problems and driven by the supervisor, who  
631 openly admitted that they had not received thorough appraisal training:

632

633 *“Appraisals are not being undertaken regularly and need to be revised, especially the*  
634 *time allocations and the repeated training of supervisors, the reality is that they are*  
635 *not linked to any reward system”*, (Interview Respondent).

636 There was the perception that development programmes were, in the main, directed at  
637 senior management. Management indicated that they were often poorly subscribed,  
638 citing the pressures of team meetings and operational priorities which the work force  
639 felt were a key contributor in terms of management informed decision making. The  
640 importance of development is supported by Moreaux et al., (2018), who also found  
641 that training is an antecedent to favourable attitude and behaviour. Respondents raised

642 an important shortfall in stating that there was no procedure to identify and record  
643 employees' past skills and abilities. In consequence, the company had highly educated  
644 and skilled employees doing low ability tasks which ultimately affected staff  
645 retention:

646

647 *"There is a general lack of commitment to management development programmes,*  
648 *mainly drive my logistical priorities and a lack of attendance monitoring",* (Interview  
649 Respondent).

650

651 *"Office staff and management do not appreciate and fully utilise the ability and*  
652 *competence of the workforce",* (Focus Group Response).

653

654 Despite misgivings and respondents concerns directed at training, appraisal  
655 procedures and development programmes, respondents were optimistic and assured in  
656 their self-belief. Respondents expressed the view that they had fostered positive team  
657 subcultures in which they worked to support fellow team co-workers:

658

659 *"We like working here. Yes, more money is always nice but you have to balance it*  
660 *against working with a great team. We don't need recognition from management the*  
661 *true reward is praise and respect from colleagues",* (Interview respondent).

662

663 As might be expected, the Technical/QA staff had confidence in their skill and  
664 knowledge in areas such as food safety, but other groups seem to be much less  
665 confident, further emphasising the effectiveness of the current training and  
666 development regime.

## 667 **5.0 Conclusion**

668 Utilising the 'EFSM' as a vehicle to assess the company's food safety compliance, it  
669 was possible to reveal core issues which had created behavioural and procedural  
670 frictions, such as effective alignment of the management's food safety cultural  
671 strategy within the wider work forces compliance. The data indicates that the cultural  
672 verition was not an intentional action nor a desired cultural stance. However, through  
673 the passage of time, it was evident that there was a misalignment between  
674 management intent and that of the wider employee compliance. The corollary was

675 what can be described as an extropia food safety culture. The ramifications were far-  
 676 reaching concerning an underperforming control system, stifled co-operation between  
 677 management and employees, evidence of ineffective communications and under-  
 678 utilisation of its workforce competence.

679

680 On a positive, the research revealed that there was clear commitment and loyalty  
 681 amongst the workforce and, as such, it is well within the grasp of a senior executive to  
 682 take action to resolve those issues raised in the paper. Furthermore, at a great time of  
 683 uncertainty with Brexit, increased global economic recession, political tensions and  
 684 the continuing impact of the global pandemic, the current buoyancy of the company's  
 685 profits and employee retention are significantly challenged. It is, therefore, paramount  
 686 that management commit to tackling the core issues raised in the paper and to do so  
 687 effectively will need to embrace and empower the workforce to become involved  
 688 participants. Failure to act will only reinforce the current extropian food culture.

689

690 As with the majority of research investigations they yield limitations but is only by  
 691 research can we create impact in terms of knowledge and practice. Whilst this  
 692 research was restricted to one of Europe's largest fish processing manufactures its  
 693 findings, it is hoped, will resonate with academics, practitioners and the commercial  
 694 sector.

695

## 696 **Supplementary Materials**

697

**[See supplementary materials]**

698

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**Table 1: The Enlighten Food Safety Culture Model**

<b>Key Themes</b>	<b>Core Elements</b>	<b>Key Indicators</b>
Control	Strategy Leadership Process Change	<ol style="list-style-type: none"> <li>1.The strategic and operational framework to embed and integrate food safety</li> <li>2.Inspirational leadership to champion food safety compliance</li> <li>3.Proactive and responsive attitude towards food safety processes and issues</li> <li>4.Food safety reporting is used to support a food safety change agents</li> </ol>
Co-operation	Responsibility Empowerment Teams Recognition	<ol style="list-style-type: none"> <li>1.Ensuring all employees recognize and appreciate food safety responsibilities</li> <li>2.Empowering employees to actively participate in food safety initiatives</li> <li>3.Motivating team dynamics to facilitate food safety</li> <li>4.Providing recognition to capture and promote food safety compliance / best practice</li> </ol>
Communication	Vision Norms Consistency Feedback	<ol style="list-style-type: none"> <li>1.Embedding the importance of food safety within the organizational vision</li> <li>2.Fostering food safety social norms</li> <li>3.The level of consistency and agreement in food safety</li> <li>4.Actively encourage reporting of food safety Issues</li> </ol>

Competence	Training Appraisal Development Self-belief	1. Resourcing effective training and repeat food safety training programmes 2. Promoting and evaluating food safety 3. Adopting food safety within the company belief system 4. Food safety roles and responsibilities are clearly defined
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Adapted from Watson et al. (2018a). Column 1 identifies four key themes for food safety cultural compliance. Column 2 cites core elements constituted in the respective themes. Column 3 shows key indicators of an aspired food safety culture

**Table 2: Characteristics of Questionnaire, Interview and Focus Group Respondents**

	<b>Data collection method</b>				
	<b>Questionnaire</b> (n=202)	<b>Interviews</b> (n=40)	<b>Focus Groups</b>		
			Group 1 (n=9)	Group 2 (n=9)	Group 3 (n=9)
<b>Respondent Profile</b>					
<b>Country of Origin</b>					
Czech Republic	11				1
Latvia	13	4			1
Lithuania	17				1
Poland	81	13	1	1	3
Portugal	4	2		1	
UK	75	21	8	6	3
USA	1			1	
<b>Gender</b>					
Not requested					
Male		26	8	4	3
Female		14	1	5	6
<b>Staffing Group</b>					
Senior Management	1				
Management/ Supervisory	25	15	2	5	4
QA/Technical	162	2	5	3	4
Operative	14	23	2	1	1
<b>Years employed</b>					
Not requested					
<1			2		
1-5		26	2	2	7
6-10		7	1		
11-15		4	1	3	1
16-20		2	1	2	1
21-25		1	1	1	
25-30			1	1	

**Table 3 Cronbach's Alpha Statistical Analysis of Participants Responses**

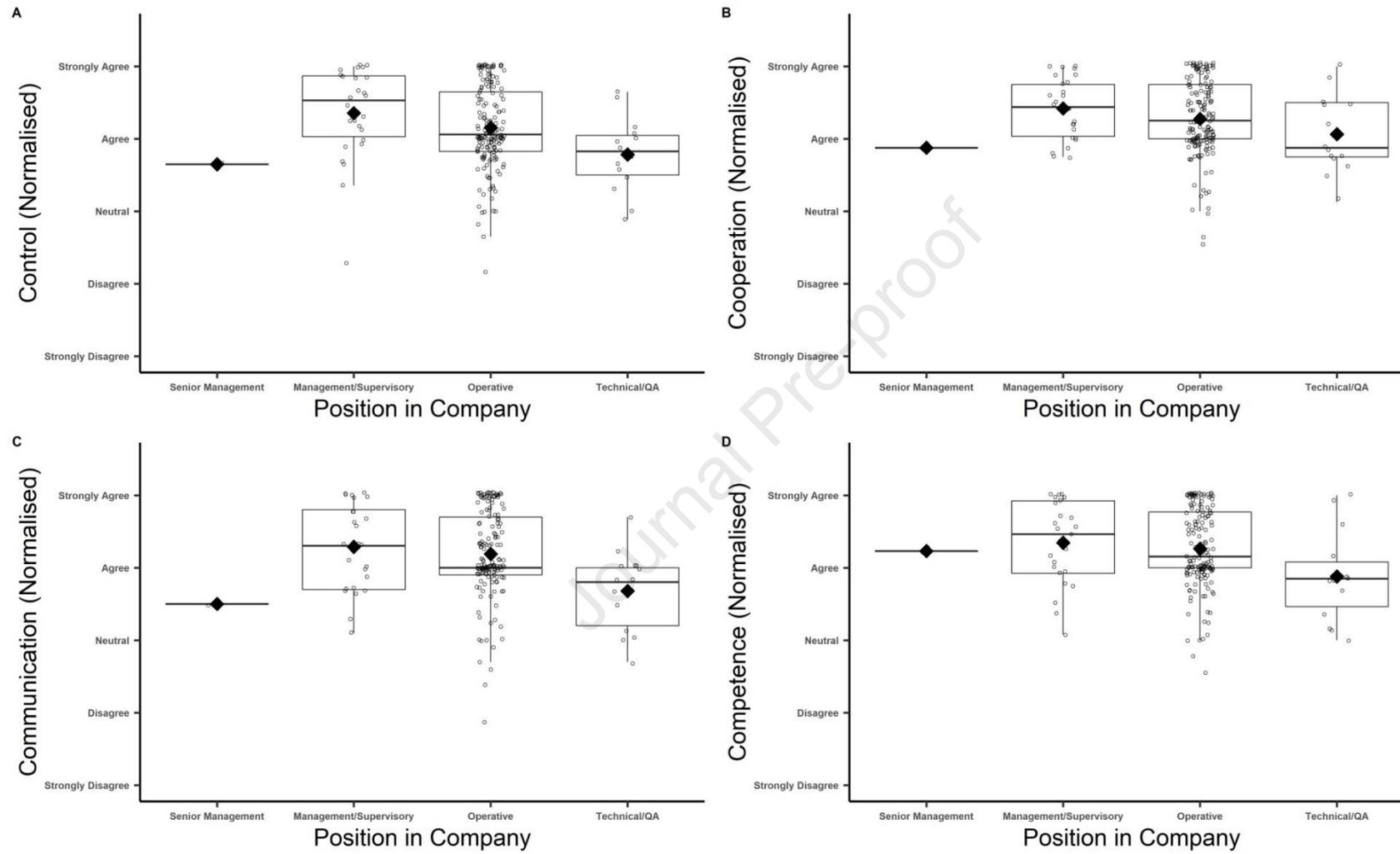
Component	Items	Cronbach's Alpha	Interpretation	KMO	Bartlett's Test of Sphericity	Total Variance Explained
Control	17	0.958	Excellent	0.950	P<0.001	61.39%
Co-operation	8	0.857	Good	0.844	P<0.001	51.21%
Communication	10	0.942	Excellent	0.934	P<0.001	67.07%
Competence	13	0.938	Excellent	0.907	P<0.001	58.44%

**Table 4: Summary of statistical tests looking for differences between staffing groups**

Latent Factor	Parametric Analysis (ANOVA)	Non-Parametric Analysis (Kruskall Wallis)	Statistically Significant Difference between Staffing Groups?
Control	(F=4.453, p=.013)	( $\chi^2=10.166$ , p=.003)	YES
Communication	(F=5.499, p=.005)	( $\chi^2=9.942$ , p=.007)	YES
Competence	(F=1.084, p=.030)	( $\chi^2=7.563$ , p=.023)	YES
Co-Operation	(F=2.223, p=.111)	( $\chi^2=4.901$ , p=.086)	NO

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**Figure 1: Graphical Analysis of Sub-Scale Data.**

Box plots show median values. Actual data and mean values (diamond) are also shown for reference

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### **Highlights**

- Quality assurance systems do not guarantee food safety compliance
- Food Safety Culture relies on both management and employee commitment
- Control, Co-operation, Communication and Competence are food safety benchmarks

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### **Conflict of Interest**

We the authors wish to confirm that there is no conflict of interest both during the research investigation and our endeavours in seeking publication of the paper via the Food Control Journal.

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