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Chinese consumer's attitudes, perceptions and behavioural responses towards food fraud

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1 **Chinese consumer's attitudes, perceptions and behavioural responses towards food**

2 **fraud**

3

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35

36 Abstract

37 Regulation of food systems exists to ensure safety and enhance consumer confidence
38 in the food which they purchase and consume. However, some regulatory systems fail
39 to instil public confidence. In China for example, trust in the domestic food system is
40 low as a consequence of multiple high-profile food scandals, many of which linked to
41 food fraud. Fraud occurs when food is intentionally adulterated for economic gain and
42 may, but not always, pose a risk to the safety of food. Food authenticity and quality
43 may also be compromised. The focus of this research relates to how Chinese
44 consumers perceive food fraud and make choices in the absence of trust in regulatory
45 systems. Seven focus groups with middle class Chinese participants in tier 1 and 2
46 cities (Beijing, Guangzhou and Chengdu) were conducted to explore attitudes of and
47 perception towards food fraud. Infant milk formula, olive oil and Scotch whisky were
48 used as prompts for attitudinal and perceptual elicitation. The findings indicated that
49 Chinese consumers consider food fraud to represent a food hazard that poses a threat
50 to the authenticity, quality and reliability of food and increased the risk of purchasing
51 and consuming of unsafe food. Consumers were found to rely on informal kinship
52 networks as trusted sources of information regarding food products' authenticity and
53 safety. Behavioural responses included a range of risk relieving strategies to support
54 food purchasing judgements, in the perceived absence of regulatory protection, that
55 included: pre-purchase and consumption information seeking; the use of product
56 attributes as authenticity cues; carefully selected acquisition sources; as well as a
57 range of domestically-situated food practices. The strategic implications for food
58 companies and policy are discussed.

59

60 **Key words:** Food fraud, Economically Motivated Adulteration (EMA), consumers,
61 food risk, trust

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62 1 INTRODUCTION

63 Regulation of the food supply chain and food business operations are intended to
64 protect public health by ensuring food to be safe for human consumption, and that
65 products are traceable, appropriately labelled, and can be withdrawn or recalled if
66 quality and/or safety is compromised (see. E.g. EC Regulation 178/2002). Such
67 regulatory frameworks underpin consumer confidence and trust in the foods they
68 purchase and consume (Garcia Martinez et al., 2013). In environments where such
69 regulations are either developing and/or a population does not fully trust or have
70 confidence in the safety and integrity of their food supply, the question of how
71 consumers make judgements about food safety and integrity arises. This paper
72 addresses this question through an analysis of Chinese consumers' attitudes towards,
73 and perceptions of, food fraud and authenticity and considers their behavioural
74 responses to limited trust in the domestic food system.

75

76 Chinese food production is associated with various characteristics that make it a
77 suitable focus for this study. First, China's 'industrialisation' stage of economic growth
78 and population expansion (expected to reach 1.3 billion by 2050; (Worldbank, 2017)),
79 is placing significant demands on its agricultural system and food security (Jin and
80 Jiang, 2002). To meet this increased demand, the domestic food chain has experienced
81 rapid and often unregulated growth (Eves and Cheng, 2007, Ortega et al., 2011).
82 Chinese food policy has historically prioritised the provision of adequate quantities of
83 affordable food to meet rising domestic demand, often to the detriment of the
84 environment and public health (Zhang et al., 2016, Ghose, 2014, Eves and Cheng,
85 2007). For example, at the farm level, pressures to increase yields have resulted in the

86 over reliance on chemicals in production (Ortega et al., 2011, Ma et al., 2014). The
87 consequences have been safety problems relating to the sale of vegetables tainted with
88 hormones, pesticides and antibiotics. These are used to accelerate growth and improve
89 appearance, at the same time, exceeding regulated limits and posing a potential risk to
90 public health (Foster, 2011).

91

92 Second, the food landscape is characterised by a preponderance of small food producers
93 and manufacturers, whose size and flexibility enables them to elude inspection, cease
94 trading to avoid punishments and/or re-emerge under a different trading name if they
95 are associated with food quality and safety problems (Ortega et al., 2011). The scale
96 and operational flexibility of these businesses poses significant regulatory challenges.

97

98 Third, regulation of the Chinese domestic food system was only relatively recently
99 formalised (Tang et al., 2015, Jia and Jukes, 2013). The Chinese Food Safety Law
100 (2009) represented the first legislative effort to regulate from production through to
101 consumption (Pei et al., 2011, Zhang and Xue, 2016). This law created a state-level
102 food safety commission to oversee implementation of the law. The law contained 104
103 articles outlining key provisions to address the supervision, monitoring and
104 enforcement of food safety across China by identifying directives for product recall,
105 traceability, licencing and standards development (Petry and Wu, 2009), and was
106 arguably a response to the 2008 melamine in formula milk incident. The revised Food
107 Safety Law (2015) addressed fragmented and unclear institutional responsibilities (Xue
108 and Zhang, 2013), weak enforcement and inadequate penalties for those contravening
109 the law (Jia and Jukes, 2013). The Law gave the authorities greater levels of power to
110 prosecute violations and impose stricter penalties. Although it has been argued that

111 China's current food safety regulations are one of the most stringent globally (Sim,
112 2016, Zhang et al., 2016), it will take time for the impacts of the 2015 revisions to be
113 felt. Concerns remain regarding the capacity of the revised legislation to regulate large
114 numbers of small supply chain actors (Zhang et al., 2016). Challenges can be identified
115 around limited third party quality certification (Zhang et al., 2015), and lack of data and
116 technology to support the identification of existing and emerging food safety risks,
117 including food fraud (Tang et al., 2015).

118

119 Fourth, despite substantial improvements to the governance of the domestic food
120 supply chain, communication of regulatory reforms to consumers, transparency and
121 availability of information regarding food quality and safety measures focused on
122 consumer protection has been inadequate (Zhang et al., 2016). This criticism has also
123 been levelled at previous (2009) legislative efforts (Calvin et al., 2006, Liu et al., 2014).
124 The magnitude of high-profile food scandals, including the 2008 melamine issue (Pei
125 et al., 2011), the 2011 'gutter oil' scandals, and persistent fraudulent activity reported
126 across the food system (O'Brien, 2017, China Food and Drink Administration, 2017),
127 coupled with communication deficiencies, have had profound impacts on consumer
128 trust. Chinese consumer confidence in the domestic food system is low (Mol, 2014)
129 and consequently, food safety (including authenticity) has consistently ranked as
130 Chinese consumer's top safety concern (Wu et al., 2013, Lam et al., 2013).

131

132 Finally, from an industry perspective, following liberalisation, in recent decades
133 China has become the "world factory" for both genuine and fake brands (Liu et al.,
134 2015). Chinese consumers are exposed to a vast variety of domestically and
135 internationally produced products, some of which are counterfeited, or mimicked

136 (ibid). At the same time, China represents significant market development
137 opportunities for food and drink companies. For example, China is Europe's second
138 largest export market (after the USA). In 2016, agri-food exports accounted for 8.7%
139 of all European products exported to China, an increase of 23.7% on the decade
140 between 2006-2016, with a value of €11, 385 billion (European Commission
141 Directorate General for Trade, 2017). China's growing middle-class has significant
142 purchasing potential, and demand for high quality and luxury foods are increasing,
143 representing significant market potential for high quality European food exports
144 (Lomas, 2017, Eves and Cheng, 2007). Therefore, understanding how Chinese
145 consumers make food purchasing decisions could help European companies to
146 differentiate their products and support consumers' judgements about food quality,
147 reliability and safety.

148

149 Food authenticity is concerned with ensuring that food offered for sale or sold is of
150 the "nature, substance and quality expected by the purchaser" (Section 14 Food Safety
151 Act 1990). It provides a conceptual lens through which questions surrounding food
152 fraud and safety can be explored and can allow consumers to objectively assess
153 claims made by product manufacturers. There are two central perspectives on
154 authenticity; i) objectivist and; ii) constructivist, both of which contribute to the
155 identification of authentic products and help to develop and maintain consumer trust
156 (Kendall et al., 2018, Carsana and Jolibert, 2018). Objectivist perspectives consider
157 authenticity as a quality that can be measured by experts e.g. through verification
158 using analytical methods to establish if a product's ingredients and stated origin are
159 compliant with standards. In contrast, constructivist perspectives regard authenticity
160 to be a projection of an individual's belief and expectations about a product (Carsana

161 and Jolibert, 2018). This would be supported by the cues that companies use to
162 enhance their consumers' confidence in the authenticity of their brands and products.
163 Objective measures of authenticity are inherently difficult for consumers to verify (i.e.
164 they are unable to easily perform the analytical tests required to establish if the
165 composition of a product meets with the ingredients listed). Therefore, when making
166 food purchase and consumption decisions, consumers more commonly rely upon
167 constructivist cues provided by manufacturers as heuristics denoting a product's
168 authenticity (Grayson and Martinec, 2004, Barnett et al., 2016, McCarthy and
169 Henson, 2005, Carsana and Jolibert, 2018). Some cues may provide added (objective)
170 confidence although these are often difficult to verify through analytical methodology
171 making them potentially vulnerable to fraud. For example, certification indicating
172 compliance with standard schemes, such as, geographical area of production such as
173 the European "Protected Geographical Indication" (PGI) or symbolic attributes of a
174 product conveyed through the marketing and branding.. Tangible (constructivist) cues
175 such as tamper proof seals, QR codes, holograms, or customer care line information
176 are an additional reassurance specifically designed to help consumers assess the
177 integrity of a product at the point of purchase and consumption and act as a key
178 deterrent to fraudsters. Whilst these may be subject to fraudulent practice,
179 manufacturers can take measures to ensure that cues are difficult to replicate,
180 providing the consumer with the most robust indication of a product's reliability and
181 authenticity at the point of purchase (Kendall et al., 2018). Consumers are required to
182 assimilate information provided by the objective, constructivists and integrity cues to
183 help them make assessments regarding a products authenticity.
184 Conversely, an inauthentic product is created *via* the act of fraud, which can be
185 defined as *'the deliberate and intentional substitution, addition, tampering, or*

186 *misrepresentation of food, food ingredients, or packaging; or false or misleading*
187 *statements made about a product for economic gain'* (Spink and Moyer, 2011). Food
188 may be adulterated in many ways. Table 1 presents common types of food fraud and
189 where possible, provides illustrative examples from cases detected in the Chinese
190 food supply chain.

191

192 INSERT TABLE 1 HERE

193

194 Food fraud involves intentional and deliberate acts committed for economic gain
195 (Spink and Moyer, 2011). The undisclosed and unknown nature of possible
196 adulterants means that food fraud may, but does not always, pose significant risks to
197 food safety (ibid). For example, the “horsemeat scandal” involved the intentional
198 mislabelling of horse meat as beef, sold across Europe in 2013. Whilst this incident
199 did not carry a significant public health risk, it challenged consumer’s trust in the beef
200 food chain, together with the integrity of the European food system as a whole
201 (Brooks et al., 2017, Barnett et al., 2016).

202

203 Fraudulent practices have been associated with many of China’s recent food scares (see
204 Table 1), with these typically uncovered through media reporting rather than official
205 surveillance or government information dissemination. Zhang and Xue (2016) collated
206 media reports of food fraud across China from 2004-2014 and identified 1553 reports
207 of intentional food fraud. In 2007 alone, the Xinhua News Agency reported more than
208 60,000 fake food cases, with over 15,500 tons of substandard food being confiscated,
209 and 180 food manufacturers identified as producing sub-standard food or using inedible
210 ingredients in food manufacturing (Veeck et al., 2010). While the overall risk posed to

211 society from malevolent activity in the food system may be assessed by experts to be
212 low, media reporting serves to amplify public concern and compromise consumer trust
213 (Kasperson et al., 1988).

214

215 However, Lord et al. (2017) and van Ruth et al. (2017) suggest that food fraud is not
216 only committed by highly organised crime syndicates that infiltrate food systems
217 (Elliott, 2014, Europol, 2015) but can also be perpetrated by legitimate actors in the
218 food chain, who have access to a location where food fraud can be committed and
219 where criminal opportunities arise to engage in fraudulent practice alongside
220 legitimate business operations. The regulatory difficulties arising from the scale of the
221 Chinese food system, and associated challenges linked to inspection and regulation,
222 has fostered an environment where food fraud has become an acceptable practice,
223 even within legitimate food companies, as the 2008 melamine in powdered milk
224 scandal highlighted (Zhang and Xue, 2016).

225

226 Furthermore, the cost of food fraud is directly born by the consumer and the food
227 industry (Elliott, 2014). In addition to potential public health risks, consumers who
228 fall victim to food fraud may suffer financial loss and experience negative emotions.
229 This undermines consumer trust in the food industry and its governance. From an
230 industry perspective, food fraud can dramatically devalue the premium status of a
231 countries' supply chains and the value of domestic and export products (Spink et al.,
232 2015), as highlighted by the global ban on exported powdered milk products produced
233 in China in the wake of the melamine scandal (Liu et al., 2014, Wu et al., 2011).

234 *1.1 Consumer Trust in Chinese Food Chains*

235 Consumer trust underpins consumer confidence in the food which they purchase and
236 consume. In the absence of food risks, consumer trust in the food supply chain is
237 typically high, and it is assumed that actors in the food system, particularly those
238 tasked with food-risk management, take an active role in protecting consumers (De
239 Jonge et al., 2004). However, in China, numerous food safety incidents have
240 undermined consumer trust in the domestic food system and the structures that govern
241 it (Zhang et al., 2016, Liu et al., 2014).

242 The presence of food risks creates uncertainty for the consumer (Zhang et al., 2016).
243 Food choices are a routine part of everyday life with consumers making multiple food
244 choice decisions daily. Consumers do not possess the level of knowledge, or capacity
245 required to assess the associated risks of each food decision. As a consequence,
246 consumers rely on information and signals provided to them by the food industry and
247 its regulators (Siegrist and Cvetkovich, 2000). If consumer's trust the integrity of
248 actors in the food system, it reduces uncertainty for consumers regarding possible
249 risks of food and reduces the complexity of everyday decision-making (Luhmann,
250 2000, Van Rijswijk et al., 2008, Siegrist and Cvetkovich, 2000).

251

252 The complexity of modern food systems means that food based interactions are
253 typically conducted between strangers mediated by institutions including food
254 manufacturers, regulators and enforcement services. Trust in organisations, such as
255 these, is referred to as "institutional trust", which is built and maintained through
256 consumer perceptions that first, regulation, enforcement and surveillance systems are
257 robust, and second, transparency in regulation and communication with consumers

258 regarding the measures taken to protect their interests in relation to food and the
259 absence of incidents (Zhang et al., 2016, Barnett et al., 2016). “Institutional trust” is
260 communicated by signals, or heuristics, provided to consumers by manufacturers and
261 regulators through, for example, quality certifications, packaging and labelling that
262 support the evaluation of credence characteristics such as fair trade production claims
263 (Liu et al., 2015, Grayson and Martinec, 2004, El Benni et al., 2018). However,
264 institutional trust lacks face-to-face validity and is easily challenged or disrupted,
265 through for example, the occurrence incidents that compromise the integrity of food,
266 as has repeatedly been the case in China (see Table 1) (Lyon and Porter, 2007, Zhang
267 et al., 2016). In these situations, consumers tend to revert to informal networks or
268 alternative food networks to gather information relevant to the reduction of perceived
269 risks associated with food. Indeed, there has been a reported increase in the
270 prominence of alternative food networks in China in recent years (Lyon and Porter,
271 2007, Zhang et al., 2016, Kendall et al., 2018). To increase institutional trust, the
272 Chinese government has introduced progressively more stringent regulation and
273 enforcement activities (*via* the Food Safety Law 2009 and 2015) to improve domestic
274 food safety standards and increase harmonisation with international standards, as
275 well as to meet growing consumer demand for food safety improvements (Wang et
276 al., 2009).

277

278 Certification schemes have been introduced to compliment regulatory reforms and
279 aim to improve food safety, reduce the ecological impact of food production, and
280 improve consumer trust in food produced in China¹. Standards and certifications do

¹¹ Three primary certification schemes are present in China, ‘Green food’, ‘Hazard free food’ and ‘safe food’. The ‘Green Food’ certification was introduced to reduce the ecological impact of farming practice. Limits the use of chemicals used in the production process to safe chemical synthetic

281 not relate directly to food fraud prevention. Nonetheless, they provide signals by
282 which the consumer can objectively verify the quality of food and help to establish its
283 reliability and rebuild trust in the integrity of the domestic food supply chain.
284 However, very few products available to Chinese consumers are certified, and
285 multiple labels are used by manufacturers to represent the same certification (Mol,
286 2014). Moreover, imported food products carry additional certifications, signalling
287 compliance with production standards in their country/region. For example, European
288 products carry certifications that signify country of origin and production
289 specifications (i.e. “Protected Destination of Origin” (PDO) and “Protected
290 Geographic Indication” (PGI)). The proliferation of certifications included on food
291 may cause consumer confusion (Scott et al., 2014). Consumers may be uncertain
292 about the meaning and use of food certifications and safety labelling, and may distrust
293 the authenticity of product certifications (Calvin et al., 2006), highlighting the
294 widespread belief amongst Chinese consumers that certifications can be counterfeited
295 and/or purchased, and therefore are not a reliable guarantee of food quality or safety
296 (Zhang et al., 2016). In addition, transparency around food systems is not routinized
297 or institutionalised, and actions taken to improve consumer protection have not been
298 appropriately communicated to consumers (ibid), further adding to a lack of
299 institutional trust.

300 Research conducted to date, exploring the drivers of Chinese consumer trust in the
301 domestic food system, has primarily focused on understanding consumer attitudes
302 towards traceability, including willingness-to-pay for food that can be traced through

substances. ‘Hazard Free Food’ designed to address the Chinese food safety ‘crisis’ and agro chemical contamination (Scott, 2014). A wider range of agro-chemicals are allowed than ‘Green Food’ and provides a basic set of standards for food that is sold in mainstream food chains. ‘Organic Food’ established to meet international market demand and ensure that Chinese food was able to compete in this growing international market and a certification that was imported from the west.

303 the supply chain and/or that carries product quality certifications, and credence
304 attributes such as country of origin (see Bai et al. (2013), Zhang et al. (2012), El
305 Benni et al. (2018), Ortega et al. (2011), Tang et al. (2015), Walley et al. (2014), Wu
306 et al. (2011), Xu and Wu (2010), Xu et al. (2012), Zhang et al. (2016)). Whilst these
307 mechanisms help consumers to identify food that is safe, meets quality expectations
308 and provides an objective basis upon which product claims might be assessed, food
309 fraud has not been the explicit focus. This research seeks to address this gap by
310 providing detailed baseline insights into how Chinese consumers perceive food fraud
311 and the threats that emanate from malevolence in the food chain. In a situation where
312 the perceived vulnerability to encountering fraud is regarded to be high, trust in the
313 regulatory authorities to identify fraud and penalties given to those perpetrating fraud
314 are considered to be low, we explore how consumers deal with information
315 asymmetry and make food choice judgements, and in so doing, address the following
316 research questions:

- 317 1. What are Chinese consumer's attitudes towards and perceptions of food fraud?
- 318 2. What are the behavioural responses discussed by Chinese consumers to mitigate
319 the perceived risks posed by fraudulent activity in the food chain? And;
- 320 3. What are the implications for the European and Chinese food industry and
321 policy makers?

322 Perception research of this nature is of relevance to a range of stakeholders including,
323 food policymakers, regulators and the food industry. It supports the development of
324 targeted policies and practical measures that reduce consumers' level of risk concern
325 and increase trust in the domestic food supply chain as well as providing insights as to
326 how these might be most effectively communicated to consumers (Renn, 2004).

327 2 METHOD

328 To explore how middle-class Chinese consumers', as the intended target market for
329 European food products, make decisions about the integrity of food that they
330 purchase and consume, focus group methodology was employed. Focus groups
331 capture of data regarding consumers' decisions and provide an opportunity to
332 explore the social context in which they are made (Robinson, 1999). As carefully
333 planned discussions which are conducted in a non-threatening environment
334 (Krueger, 2014), focus groups are a well-established technique for eliciting attitudes
335 and perceptions about abstract concepts which are enhanced by group interactions
336 (Kitzinger, 1994). The methodology has cross-cultural validity, and has been used
337 in the Chinese cultural context to explore consumer food choices (Veeck et al.,
338 2010) and perceptions of novel food production technologies (Perrea et al., 2015).

339 2.1 Procedure

340 Discussion guides were developed and refined based upon a review of the literature.
341 Selected food products from Europe, available on the Chinese market, were used to
342 focus and facilitate the discussion. Three product categories, i) Scotch whisky, ii)
343 infant milk formula and iii) olive oil, were selected. The product categories were
344 chosen on the basis of the contrasting perspectives that they offered to explore
345 perceptions of food fraud and adulteration based upon: the products' food safety
346 and adulteration histories in the EU and China; traceability-related labelling cues
347 such as protected designation of origin (PDO) and country of origin references;
348 product usage amongst different consumer groups with different vulnerabilities (i.e.
349 infants); and use across diverse consumption occasions (Table 2). Product and

350 brand choice² were based upon their availability and familiarity in the Chinese
351 market, and differences in product origin and packaging. The Scotch whisky
352 prompts were presented as pictures on laminated cards. Infant milk formula and
353 olive oil products were shown to discussants.

354

355 INSERT TABLE TWO HERE

356

357 Owing to the differences in usage profiles and contexts of the product categories,
358 two discussion protocols were developed. The first incorporated infant milk formula
359 and olive oil, and the second Scotch whisky and olive oil. The structure and
360 questions included in the two protocols were identical in order to facilitate
361 comparative analysis. Following a welcome introduction, the discussion opened
362 with questions relating to food safety concerns. This led into discussions about food
363 authenticity and participant awareness of food fraud in relation to the specific
364 product examples. The discussion then considered attitudes towards traceability,
365 confidence and trust in food provenance. Communication preferences with regards
366 to food authenticity were explored and a “wind-down” allowed participants the
367 opportunity to ask questions and provide comments on the process. The full
368 discussion guide is available from the authors on request.

369

370 The protocol was piloted *via* two focus groups with a convenience sample of
371 Chinese students studying at the UK authors’ university. Piloting was conducted to
372 test procedural aspects of the protocol, and ensure questions were relevant to a

² Product prompt brand choice are not detailed although information is available from the corresponding author on request.

373 Chinese sample. The discussion guide was translated into Chinese by the social
374 research agency, Millward Brown, who provided recruitment and moderation
375 support. For consistency across groups, the same moderator conducted all groups. A
376 bilingual member of the project team back-translated the protocol to ensure that
377 “meaning” was appropriately conveyed in Chinese. Ethical approval for the
378 research was granted by the lead authors’ university ethics committee in August
379 2014.

380 2.2 *Sample*

381 Seven focus groups were conducted in three Chinese cities in the North, South and
382 East of China respectively, Beijing, Guangzhou and Chengdu. 42 participants took
383 part in the study (Table 3). Two groups were held in each location. One group per
384 protocol was conducted in each city, and an additional pilot group was held in
385 Beijing, with no protocol amendments made to subsequent group discussions (group
386 1). Beijing and Guangzhou are first tier cities and represent the most economically
387 developed regions in China with the most affluent consumers. Chengdu is a second
388 tier city, and is a capital city at the provincial level and are considered to be
389 developing. Consumer trends mimic those in the first tier cities. Consistent with
390 best practice, each focus group contained 6 participants recruited on demographic
391 characteristics and purchasing habits, specifically gender (males and females), age
392 (18-45 years), socio-economic status (middle/upper class); who had purchased
393 infant formula milk, olive oil or Scotch whisky in the last three months; were the
394 main or joint decision maker for food purchases in their home and had resided in
395 their respective cities for 3 years or more.

396

397 INSERT TABLE 3 HERE

398

399

400 All focus groups were held at the regional offices of the social research agency. To
401 ensure quality of the data collected, members of the research team were present at
402 each group. Discussions were simultaneously translated and observed by the
403 research team *via* two-way glass. Each focus group lasted approximately two hours,
404 was digitally recorded and transcribed *verbatim* in Chinese, and translated into
405 English for subsequent analysis. All participants were given an incentive payment
406 for their contribution to the research, in line with typical remuneration for research
407 participants in China. During discussions, notes were made by members of the
408 project team on content, group dynamics and recurrent ideas and discussions that
409 emerged across the groups. These preliminary reflections aided the first stage of the
410 analysis process and helped to frame the concepts that were used to develop a
411 systematic coding framework in stage one of the analysis. All data were collected in
412 January 2015.

413

414 Data were analysed using analysis package QSR NVivo 11 (NVivo, 2016). Analysis
415 followed a three-stage process. First, three members of the project team (HK, SK
416 and MD) independently undertook open coding of the transcripts using an
417 inductive, grounded approach (Glaser and Strauss, 1967). This process involved
418 each research reading each of the transcripts and identifying common themes across
419 the groups for later discussion. Second, researchers (HK, SK and MD) met
420 (February 2015) to discuss and consolidate the emerging key concepts,
421 subsequently an initial coding framework developed by the lead researchers (HK
422 and SK). Refinement of the coding framework involved two members of the

423 research team (HK and SK) independently coding transcripts and comparing the
424 codes against the framework. The final stage involved one researcher (HK) coding
425 the full data set into the coding framework. The coding framework is available from
426 the corresponding author upon request.

427 **3 FINDINGS**

428 The focus groups revealed a broad range of insights relating to how Chinese
429 consumers responded to the absence of a trusted regulatory environment.
430 Participants were forthcoming in sharing their views and experiences of fraudulent
431 practices in the food chain. Five prominent themes emerged from the data that
432 concerned; 1) food fraud as a perceived risk to the safety of food, 2) barriers to
433 attainment of authentic and safe food, 3) consequences for the consumer of food
434 fraud, 4) consumers' risk-relieving strategies, and 5) situational dependence of the
435 perceived importance of food fraud. The findings are discussed under these themed
436 headings and supported by illustrative quotes from participants that are direct
437 translations from Chinese to English. Quotes are labelled according to the focus
438 group location, the group number and discussant gender.

439

440 *1) Food fraud; as a perceived risk to the safety of food*

441 Respondents used food fraud as an umbrella term that encompassed concerns
442 relating to the authenticity, safety, quality and the reliability of food. Herein food
443 fraud will be defined in line with participant perceptions, as an *intentional action*
444 *taken to deceive the consumer and compromise the authenticity, safety, quality and*
445 *reliability of food*. In the absence of fraud, food was considered to be authentic i.e.
446 was what it claimed to be, safe and of reliable quality. Across all groups, the

447 potential risks that fraudulent activity in the food chain posed to the safety of food
448 was of greatest concern.

449

450 The safety of food was couched within expressions of anxiety, concern and
451 resignation, that fraud and the safety implications of this, needed to be “*accept[ed]*
452 *if you must live here*” (Chengdu, G4, Male). Participants gave many examples of
453 cases of food fraud that had been reported in the media, and recalled incidents in
454 which they perceived the food that they had purchased or consumed to have been
455 subjected to fraud. The perceived incidents could be categorised as cases of
456 misdescription, adulteration or counterfeiting as the following quotes illustrate:

457

458 *“Lots of ingredients are not in the list, but the ingredients which are*
459 *not in the list may cause bad effect on the body” (Chengdu, G4,*
460 *Male).*

461

462 *“The news has reported that vegetables have been grown with*
463 *pesticides and hormones that are over the limited amount”*
464 *(Guangzhou, G6, Female).*

465

466 *“I think these are all worries for the food we eat, for the meat, there*
467 *is lean pork powder, using the pork to replace the beef, or the meat*
468 *that is from ill animals not intended for human consumption”*
469 *(Guangzhou, G6, Female).*

470

471 *“Many brands are only a little different between the real one [and*
472 *fakes], ...the difference is one word, Yi Bao, it will be called Yi Hao”*
473 *(Guangzhou, G7, Male).*

474

475 Embedded with the examples of food fraud were perceived risks to the safety,
476 quality and reliability of food. Notably, participants were unable to distinguish the
477 concept of food fraud from food safety. Respondents did not recognise that food
478 subjected to fraud may, but also may not, pose a risk to the safety of food. Thus,
479 food fraud was considered a significant risk to the safety of food and the health of
480 consumers.

481

482 2) *Barriers to the attainment of authentic and safe food*

483 Fraudulent practices in the food chain represented one of three perceived barriers to
484 the attainment of authentic food precipitated by; 1) the complexity; 2) size of the
485 Chinese domestic food system and; 3) deficiencies in the regulatory environment
486 linked to food chain complexity and size. These were considered to provide an
487 environment conducive to misconduct by external actors (criminals) and
488 opportunistic internal food system agents, and cited by participants as the primary
489 reasons for the Chinese domestic food supply chain’s vulnerability to fraud. Figure
490 1 presents the authors interpretation of how these factor link together.

491

492 INSERT FIGURE 1 HERE

493

494 The highly fragmented structure of the Chinese food industry, characterised by a
495 proliferation of small and medium-sized enterprises (SME), was considered to
496 present significant regulatory challenges to reducing fraudulent practice. Rapid

497 growth and development of the food system in recent decades was perceived to
498 have placed considerable pressures on regulatory systems, and incentivised
499 fraudsters. Effective regulation and enforcement was believed to be inhibited by the
500 physical and financial capacity of multiple food regulation agencies to supervise
501 food production and manufacturing, and enforce compliance with standards.

502

503 *“The city in China is developing, there are many things you can’t*
504 *catch up with...the department [food regulators] face such a lot of*
505 *people, they can’t cover everything, things are changing rapidly in*
506 *China.” (Guangzhou, G6, Male).*

507

508 *“Maybe the lack of people, they [food regulators and enforcement]*
509 *can’t check every market” (Guangzhou, G6, Female).*

510

511 Greater risk of intentional criminality was believed to occur at smaller food
512 production and manufacturing sites that eluded regulation. Greater trust in larger
513 food manufacturers and producers was expressed; brand equity was perceived as
514 having significant corporate value, and represented a key fraud prevention
515 mechanism. A cultural explanation for fraudulent practices was the profit driven
516 focus of the Chinese food industry, which, supported by economic policy, was
517 considered to prioritise the pursuit of economic gain over consumer interests.

518

519 *“Chinese people [industry] have faith about money, they believe profit*
520 *is the most important thing” (Beijing, G2, Female).*

521

522 This prioritisation of profits over consumer interests manifested in poor customer
523 service, and the perceived reluctance of food producers to recall products if
524 problems relating to authenticity and/or safety were identified. This was considered
525 to be most pronounced in small-scale manufacturers, who were believed to be
526 difficult to locate and unresponsive to consumer concerns. Larger retailers were
527 acknowledged to be more accountable and willing to recompense consumers for
528 products that did not meet with their quality expectations.

529

530 *“They [smaller companies] do not think they have much duty. Their*
531 *attitude is just if consumer can find, they will return the money. If*
532 *consumer cannot find, then nothing happens”.* (Chengdu, G4, Female).

533

534 Disparities in regulatory standards, between cities and provinces in China and
535 between Chinese and international standards were also noted. More stringent
536 regulation of food producers and manufacturers in higher tier cities were perceived
537 to exist, as the following participant explains:

538

539 *“If you live in China...in the third-tier cities, it’s terrible, on the food*
540 *safety aspect...they just put things to the first-tier city in China... the*
541 *development of supervision for the countryside in comparison to the*
542 *city is not good, one reason is they have no money”* (Guangzhou, G6,
543 *Male).*

544 Discrepancies in food quality and safety (including authenticity) were
545 identified between foods produced domestically and internationally, with

546 respondents regarding food produced internationally, particularly in Europe
547 to offer greater authenticity, quality and safety assurances.

548

549 *'We think the power of foreign country is strong, and the food*
550 *is reliable, such as Europe... I think the reality is that food is*
551 *more reliable in other countries.'* (Beijing, G2, Female).

552

553 Additional barriers to authentic food which compounded trust in the regulatory
554 environment included: perceived lack of punishment of fraud offenders; perceived
555 corruption linking food producers and regulators, such that "*permissions can be*
556 *bought*" (Chengdu, G4, Male), and a reactive rather than proactive approach to
557 governance.

558

559 *"A lot of brands are exposed relating to [food] quality problem[s], but*
560 *I have never heard that they are punished."* (Chengdu, G4, Male).

561

562 Despite strict penalties for those implicated in food fraud imposed by the Food
563 Safety Law 2015, consumers maintained the perception that regulators adopted a
564 lax approach, with food manufacturers known to be engaged in fraudulent activities
565 in order to promote economic growth in the sector.

566

567 *3) Consequences for the consumer of food fraud*

568 The implications of purchasing and consuming inauthentic food included both
569 direct and indirect impacts, including illness, a loss of "face", emotional harms and
570 disempowerment through a lack of personal control in the provisioning of authentic

571 and safe food. Consumers attributed food fraud to direct health risks, and cited the
572 2008 melamine in milk food scandal to illustrate the potential magnitude of the risks
573 associated with food fraud. It was the perceived risk of harm from food fraud at the
574 level of the family unit that posed greatest concern to participants. Concerns were
575 expressed for the unknown, long-term, cumulative health impacts for infants and
576 children whilst adults were identified as having greater resilience to impurities
577 within their food. Responsibility for ensuring the integrity and safety of children's
578 foods was identified as the sole responsibility of parents, and resulted in greater
579 involvement in the purchase of goods intended for consumption by infants and
580 children.

581

582 *“The baby cannot distinguish what they have eaten, so their foods*
583 *need to be check[ed]. We would rather maltreat ourselves than*
584 *maltreat our children.” (Guangzhou, G5, Female).*

585

586 Indirect impacts included the loss of “face” (accompanied by embarrassment,
587 shame, and humiliation) emerged as a sub-theme and was considered a significant
588 negative consequence of food that had been subjected to fraud. The Chinese cultural
589 practice of gifting, expensive, well-presented (denoted by high quality packaging)
590 goods, which signify the esteem of the giver to the recipient, is laden with “cultural
591 affect”. Product authenticity as denoted by indexical attributes such as price,
592 packaging and country of origin was therefore important in the observance of
593 expected social conventions. Increased care was taken by consumers when selecting
594 products suitable for “gifting” as it was socially unacceptable to give inauthentic
595 gifts: *“we can't give counterfeits as gifts” (Chengdu, G4, Male).* Encountering

596 inauthentic food resulted in emotions of anxiety, anger, foolishness, embarrassment,
597 anxiety and humiliation through being cheated, deceived and/or tricked by food
598 producers and retailers, a sub-theme which emerged across all groups. The strength
599 of these emotions and level of acceptance varied according to purchase and/or
600 consumption situation. For example, the melamine adulterated infant milk formula
601 in 2008 still provoked feelings of outrage by participants. However, in the case of
602 Scotch whisky, there were social drinking occasions (i.e. when purchasing from
603 bars) when participants were “resigned” to the likelihood that they would encounter
604 “fake” whisky. Underpinning the potentially negative consequences of encountering
605 food that is inauthentic was the perceived lack and/or loss of consumer control,
606 which arose from inability to judge the authenticity and safety of food, compounded
607 by the lack of transparency regarding the measures taken to protect consumer’s
608 interests in relation to food and the perceived lack of responsibility taken by food
609 producers.

610

611 4) *Risk relieving strategies*

612 Behavioural responses to the dissonance arising from a lack of control surrounding
613 food authenticity, safety, quality and reliability were manifested in consumers
614 adopting complementary ‘risk relieving’ pre- and post- consumption strategies
615 intended to minimise exposure to food risks including those arising from food fraud.
616 These (see Figure 2), included: 1) information searching; 2) the use of authenticity
617 cues as heuristics denoting the authenticity; 3) carefully selected acquisition
618 sources; and 4) a range of domestically situated practices.

619

620 **INSEERT FIGURE 2 HERE**

621 Due to imperfect knowledge about the authenticity of their food, and lack of trust in
622 the regulatory environment, participants actively sought information prior to the
623 purchase of food. Trusted information sources included external sources such as
624 word of mouth from friends and family, and media channels including television,
625 and social media channels such as “We Chat”. Previous personal experience
626 provided “internal” information reference points. In the absence of institutional
627 trust, participants prioritised recommendations from people in their immediate
628 networks of family and friends (“personalised trust” networks) above other forms of
629 external information, such as online forums and previously trusted retailers. As one
630 participant identified, there “*must be no cheating between friends*” (Beijing, G3,
631 Female). At the point of purchase participants reported using a range of cues
632 provided by manufacturers and regulators as heuristics denoting authenticity which
633 objective, constructed and integrity indicators (see Figure 2) were applied in
634 combination to support assessments of a product’s authenticity. Despite
635 manufacturers providing objective cues of authenticity (product certifications,
636 country of origin labelling, etc.) across the groups, participants reported relying on
637 traditional attributes including brand, price, and packaging as key product
638 differentiators, particularly where respondents possessed limited category
639 knowledge. As the following quotes illustrate, these cues were taken to infer
640 authenticity which included quality, safety and reliability attributes.

641

642 *“I’ll buy the best one. Because I have the traditional mind, I think the*
643 *more expensive thing have its advantage, and for the cheaper one, I’ll*
644 *doubt about its quality” (Beijing, G3, Male).*

645

646 *“We think the brand is important. Famous brands are safer... We try to*
647 *buy better raw materials, or buy great brand or buy the raw material*
648 *that has high price. We can feel comfortable by this way... I think we*
649 *need to be dependent on ourselves. We need to choose by ourselves.*
650 *The product cannot be cheap and have good quality at same time.*
651 *Whatever this country does, I can buy better brand though it is*
652 *expensive’ (Chengdu, G4; Male).*

653

654 Integrity cues including tamper proof seals, QR codes and barcodes, provided by
655 manufacturers specifically designed to infer a products integrity, were recognised to
656 support authenticity assessments. Participants reported checking for broken seals,
657 signs of tampering, poor craftsmanship, the quality of the printed labels and the
658 accuracy of labelling information. However, QR codes and barcodes were
659 considered to require additional time to interpret during shopping and were largely
660 overlooked.

661

662 *“I care about the body of bottle. Then I care about cap. Some fake wine*
663 *[spirits] is too ridiculous. It is very loose when you open it. [The]*
664 *Chinese are genius at making counterfeits.” (Chengdu, G4, Female).*

665

666 The acquisition source or place of purchase was important in determining the
667 authenticity of food products. The reputation of the retailer provided a further
668 mechanism for participants to overcome their uncertainty and risk perceptions
669 associated with food fraud. Participants perceived smaller retailers as most likely to
670 be implicated in fraudulent activity and largely avoided these. To alleviate concerns,

671 participants purchased products from “trusted retailers”, which included, large,
672 well-known retailers, for example premium supermarket chains such as OLE, or
673 Carrefour, and department stores. Such retailers carried imported product lines and
674 were acknowledged as “*more dependable to choose things from the foreign*
675 *countries’ goods shelf*” (Beijing, G3, Male). Discussants also reported that imported
676 goods that had been produced and packaged outside of China, internationally
677 branded goods produced domestically, and goods made internationally but
678 packaged in China were avoided. Concerns regarding adulteration by Chinese actors
679 involved in production and packaging were raised;

680

681 *I am afraid that the imported milk sources from abroad have experienced*
682 *second packaging and domestic packaging, which will add something we*
683 *don’t know, second pollution.’ (Chengdu, G5, Male).*

684

685 Consumers acknowledged the price premiums associated with the purchase of
686 (fully) imported products, but were willing to accept this expense in order to assure
687 the authenticity of products carrying social or health risks.

688

689 *“We can do nothing but to buy things at OLE. We can only buy*
690 *something at imported supermarket, whose products are safe although*
691 *a little expensive...Although it is more expensive than other*
692 *supermarkets, its quality can be assured.” (Chengdu, G5, Female).*

693

694 Consumer preference for imported products as the primary assurance against fraud,
695 combined with the limited availability of imported products in the Chinese market,

696 required consumers to look for alternative means to acquire their preferred and
697 trusted brands. Participants reported two primary mechanisms, first, through travel
698 to neighbouring states. For example, participants living in Guangzhou reported
699 travelling to Hong Kong and Macau for infant milk formula. Second, *via* trusted
700 kinship networks that extended into foreign countries where infant milk formula
701 was purchased and shipped back to China. The additional expense of this practice
702 and the potential unreliability was noted, although accepted, in order to guarantee
703 authenticity and safety of products, particularly those intended for infants.

704

705 Recognising that certain retailers offered differing levels of product availability and
706 quality, participants adopted a “profile” approach to procurement. This involved
707 buying products from a range of different retailers to ensure product authenticity.
708 The reliance on kinship networks to ensure access to authentic products was further
709 illustrated when considering an acquisition source. Where possible, participants
710 reported the desire to develop personal relationships with purveyors, considering
711 that such relationships would reduce fraud, as the retailers would have a duty of
712 care to them as consumers and as friends. For example, in the purchase of meat,
713 consumers reported sourcing whole carcasses of animals (pork, lamb and beef)
714 directly from farmers, reflecting a growing consumer interest in alternative Chinese
715 food networks, and willingness to travel outside of the city to purchase from the
716 producer directly. This practice significantly shortened the supply chain, and
717 removed anxieties relating to environmental pollution, contamination and
718 adulteration.

719

720 *“One of my classmates sells organic vegetables or organic*
721 *agricultural products. The eggs she sells are organic, too. All*
722 *the animals in there are feed by coarse cereals. I went to her*
723 *farms for one time. I totally trust that kind of farms. The food*
724 *from there has no additives or many processes. I feel assured of*
725 *that natural food.” (Chengdu, G4, Female).*

726

727 Participants also discussed measures taken at home (domestically situated practices)
728 to ensure the authenticity of food. Following the “gutter oil” scandal, consumers
729 reported trying to avoid eating out at restaurants, showing preference for home-
730 prepared food.

731

732 *“I feel nowadays many people have abused to use hormone and*
733 *chemical... And [there are] plenty [of] fake products imitate[ing]*
734 *qualifying products, so I am trying to only cook and eat at home”*
735 *(Chengdu, G4, Male).*

736

737 Consumers reported growing their own vegetables to reduce the amount of
738 chemicals involved in production. Some use of ozone washers to remove microbial
739 contamination and chemical residues was also mentioned. In the case of fish and
740 crustaceans, preference for the purchase of live products was expressed so that they
741 could be kept in fresh water prior to consumption to allow for toxins and impurities
742 to pass through before preparation and consumption.

743

744 *“We buy some special powder from Japan to wash vegetables. We*
745 *pour some of the powder on the vegetables when we washed it, but*
746 *there is still something that we can't get rid of” (Beijing, G1,*
747 *Female).*

748
749 *“I have a roof that is on top...a small area, then [I] plant some*
750 *lettuce, sweet potato, leaves and the like” (Guangzhou, G6,*
751 *Female).*

752 **4 DISCUSSION**

753 The Chinese domestic food supply chain has been beset with incidents that have
754 undermined its integrity and led to widespread consumer anxiety and reduced trust
755 regarding the authenticity, safety and quality of food that is available. This research
756 indicates that despite significant reforms to food safety governance in China
757 implemented by respective food safety acts (The Food Safety Law 2009 and 2015),
758 Chinese consumer trust in the domestic food system remains low. High profile food
759 safety incidents, of which many represent cases of fraud, highlight the pervasive
760 nature of fraudulent activity within Chinese food chains. Incidents have been shown
761 to be perpetrated by both criminals that have infiltrated legitimate food chains and
762 legitimate actors within legitimate food chains, as the 2008 melamine scandal
763 illustrated and is recognised to be a significant factor in low levels of consumer trust
764 in the food systems and its governance (Elliott, 2014, Lord et al., 2017, van Ruth et
765 al., 2017). Post melamine, continued widespread media reporting of food fraud
766 incidents has amplified societal risks response, and further heightened consumer
767 concerns regarding the risks that fraud poses to the attainment of safe food

768 (Kasperson et al., 1988). Despite this, a limited body of literature has sought to
769 explore the wider implications of food fraud for Chinese consumers (El Benni et al.,
770 2018).

771

772 Whilst there are accepted differences between the concepts of food fraud, food
773 safety, food authenticity and food quality (Spink et al., 2015), a significant finding
774 of this research, is that Chinese consumers do not distinguish between these
775 concepts, rather, they considered food fraud to be a term, encompassing risks to all
776 of these and ultimately the attainment of safe food. The potential for unknown
777 contaminants to be present, and evidence of significant health implications linked to
778 previous incidents, resulted in Chinese consumers perceiving food fraud to
779 represent a risk to the general safety of their food. This is consistent with previous
780 research that found food safety to be the most significant safety concern of Chinese
781 consumers, which encompassed “counterfeit” and “inferior quality” food as the
782 issues that the Chinese public were most concerned about(see (Liu et al., 2014).
783 The lack of trust in the Chinese food system was linked to a variety of factors: first,
784 the high prevalence of food safety incidents in China and representation of these in
785 the media, many of which are classified as cases of fraud. Second, the perceived
786 historical leniency of the Chinese government to regulate the domestic food system
787 as well as regulatory disparities nationally. Third, the challenges associated with the
788 regulation of a large, complex and fragmented system. Fourth, the perceived lack of
789 transparency regarding measures taken to protect consumers’ interest in relation to
790 food; and finally, the perceived lack of organisational accountability taken when
791 foods do not meet with consumers’ quality expectations.

792

793 The Chinese Food Safety Law enacted in 2009 was the Chinese government's first
794 attempts at formalising their response to food safety failings, improving standards
795 nationally and internationally and rebuilding consumer trust post melamine. Despite
796 the significant improvements this made, this research identified deep rooted
797 consumer concerns and limited recognition of the measures taken to improve the
798 safety of the Chinese food system. This indicates the need for more effective
799 communication of the mechanisms that have been implemented to protect consumer
800 interests in relation to food and greater levels of transparency around the regulatory
801 process (i.e. surveillance mechanisms and penalties for non-compliance).

802

803 Government and industry share the responsibility for improved consumer
804 communications regarding risk management and mitigation actions and consumers
805 voiced the need for industry to make more concerted efforts to provide them with
806 reassurances should products not meet with quality expectations and/or where
807 necessary, be proactive in recalling products when products have been exposed as
808 implicated in fraud. Similar consumer calls for transparency and accountability
809 were found in a study conducted by (Barnett et al., 2016) that explored consumers
810 in the UK and Republic of Ireland's (ROI) response to the 2013 "horsemeat"
811 incident.

812

813 Consumers recognised the challenges inherently associated with the regulation of a
814 large and fragmented food chain and identified this to be a key barrier to the
815 attainment of authentic and safe food. Despite efforts to harmonise standards
816 nationally and internationally, disparities in the quality of regulation between cities
817 and provinces were identified (see Tam and Yang (2005). To account for the

818 dispersed nature of food supply chains, further improvements were considered
819 necessary to improve consistency of risk management in lower tier cities with first
820 tier cities, and improve food regulation and enforcement in these cities, which were
821 identified as being the most vulnerable to fraud. Research conducted by Kendall et
822 al. (2018) indicates that consumers in lower tier Chinese cities perceive the greatest
823 risk to the authenticity and safety of food as a result of fraud, however, they also
824 found that structural trust was not a significant predictor of attitude and intention to
825 purchase authenticated food.

826

827 The range of behavioural response strategies to personally mitigate vulnerability to
828 encountering inauthentic food in response to the dissonance arising from the lack of
829 control regarding the authenticity and safety of food, coupled with perceived
830 regulatory deficiencies, is a key finding of this research. This also provides a
831 possible explanation as to why structural trust was not identified to be a significant
832 predictor of attitude and intention to purchase authenticated foods (see Kendall et al.
833 (2018). Consumers were shown to have developed a range of, pre through to post
834 purchase and consumption, strategies to mitigate the risks of encountering unsafe
835 food, which included food that had been subject to fraud. These practices included
836 extended information searching regarding products and acquisition sources, careful
837 identification of reputable and trusted retailers, the use of cues provided by
838 manufacturer to help support the identification of authentic product and a number of
839 domestically situated practices (see Figure 2).

840 Consumer preference for imported foods over domestic products were shown
841 despite the acknowledged price premium. It is recognised that Chinese consumers
842 regard European products to offer greater quality and safety assurances than

843 domestically produced alternatives and demonstrate a desire for domestically
844 produced products to reach the same level of production quality and safety (El
845 Benni et al., 2018, Liu et al., 2014, Qiao et al., 2012). Within this research,
846 European products, in particular well recognised European brands, were reported to
847 be sought wherever possible with preference shown for brands that were ‘truly
848 foreign’, abating concerns regarding tampering and adulteration during the
849 production process. This supports the findings of Liu et al. (2015) who identified
850 consumers made distinctions between the level of authenticity of branded products
851 of those that are made in foreign markets versus those that produced in China.
852 Authentic brands manufactured in their originating country were deemed to have a
853 higher level of authenticity than those produced in an inauthentic country of
854 manufacture. For example, German infant milk brand Aptamil produced in Germany
855 was regarded to be more authentic than the identical product formulation produced
856 by the same company in China. Although the methods adopted in this research do
857 not permit quantification, consumers expressed willingness to pay for imported
858 products that better met authenticity requirements.

859 The importance of interpersonal relationships in aiding the identification and
860 acquisition of reliable products (including European products) were identified. The
861 absence of trust in food chain actors resulted in the elevated importance of kinship
862 networks, including social media channels in identifying authentic products, trusted
863 retailers and sourcing products. The reliance on kinship networks has been shown to
864 be a reaction to the lack of formal systems designed to protect consumers, or a
865 response to disruptions the food chain, through for example, reported instances of
866 fraud (Lyon and Porter, 2007). This may also reflect the collectivist nature of
867 Chinese society, which places cultural value on kinship relations, with consumers

868 shown to rely more on interpersonal rather than formal communications (Yau,
869 1988). The size of the Chinese market coupled with domestic distrust represents
870 significant market potential for high quality European food exports, and industry
871 actors must recognise the importance of informal channels as valued information
872 sources by Chinese consumers. As a result, they should utilise these channels
873 (particularly social media platforms) to disseminate information regarding the
874 measures taken to deter fraud and better support consumer identification of
875 authentic products.

876 Consumers showed a preference for large retailers including international
877 supermarkets over small independent retailers or street vendors which were
878 identified to be likely to be implicated in fraudulent practice (see also Xia and Zeng
879 (2006). Large retailers were considered to offer wider product ranges, including
880 reputable supplies of imported food product, and offering greater assurances of
881 product authenticity. Consumers regarded these large retailers to be within the
882 regulatory control of government and their international reputations a key fraud
883 deterrent mechanism, as well as making them more responsive if products failed to
884 meet expectations. European food importers must recognise the strength of large
885 retailers as preferred distribution channels for imported products. That said, the
886 importance of developing strong personal relationships with suppliers and brands
887 was also recognised, with consumers valuing relationships with primary producers,
888 reflected in the growing prominence of alternative food networks in China (see for
889 example, Sausmikat (2015) and Zhang et al. (2016)). The presence of brand stores,
890 particularly in the case of Scotch whisky and olive oil, in addition to presence in
891 large retailers was identified by Chinese consumers as supporting the identification
892 authentic and safe products. European exporters of olive oil and Scotch whisky, are

893 encouraged to consider independent distribution channels as an important
894 mechanism for increasing brand presence, reputation and consumer trust and
895 loyalty, as well as a crucial means of building product category knowledge. This
896 will improve brand protection by supporting Chinese consumers to more
897 confidently identify authentic products and whistle blow where products fail to meet
898 brand standards.

899 At the product level, constructed cues of authenticity were used as one element of
900 the wider risk reliving strategies adopted by Chinese consumers to support the
901 identification of authentic products. Consumers had greatest trust in cues that were
902 difficult to replicate and as noted, country of origin was considered a key attribute
903 relied upon to support authenticity and quality assessments. Whilst considerable
904 research has been conducted exploring Chinese consumers' willingness-to-pay for
905 traceability and foods of certified quality (see (Xu et al., 2012, Tang et al., 2015, El
906 Benni et al., 2018, Wu et al., 2011, Xu and Wu, 2010), this research highlighted
907 consumer reliance on traditional indicators of product quality, such as price, which
908 were used to make inferences regarding authenticity and safety. Certifications and
909 cues of integrity were not often used despite these offering the most robust
910 indication at the point of purchase of a products authenticity and safety and the
911 ability to objectively verify these, Chinese consumers noted the sophistication of
912 fraudsters and expressed concerns that these could also be falsified (see also Cheng
913 (2011)).

914
915 Chinese consumers are however, prepared to pay a premium for trustworthy
916 authenticity cues, with authenticity and safety guarantees usually adding net value
917 to products. In order to stay one step ahead of fraudsters, manufacturers are

918 encouraged to continually innovate and increase the sophistication and variety of
919 integrity cues on products as a fraud deterrence measure. However, this research has
920 indicated that in order for consumers to use and trust these measures, innovations
921 must be designed taking into consideration consumer preferences and information
922 needs. Moreover, preference for the type of authenticity cue(s) was shown to be
923 product specific so market research should include this as a part of product testing.
924 In line with this, food industry actors are encouraged to improve communication
925 with consumers regarding the measures taken to guarantee the authenticity and
926 safety of products. Although highlighting these measures may also help
927 counterfeiters, regularly updating authenticity processes and effectively
928 communication these to consumers was thought to help industry stay one step ahead
929 of the fraudsters, and maintain consumer trust with their efforts, as well as support
930 consumer judgements regarding authentic and safe food.

931 Finally, differences in attitudes towards fraud, and the personal measures taken to
932 reduce the likelihood of encountering inauthentic food, were shown to be dependent
933 upon the intended consumer and consumption occasion. Chinese consumers were
934 found to make evaluations regarding the level of risk associated with encountering
935 inauthentic food products, with risk to health being the most feared consequence.
936 Perhaps unsurprisingly, given the industries recent safety history and the risk to
937 public health from adulteration, consumers expressed a zero tolerance towards
938 inauthentic products intended for infants (particularly infant formula milk). As
939 guardians, it was considered the responsibility of parents to ensure the authenticity
940 intended for consumption by infants. Extensive product search and acquisition
941 strategies, including travel to neighbouring states with better safety records, and
942 informal import networks to ensure its authenticity, were identified. In other

943 circumstances, in-authentic products were tolerated and even expected, as was
944 illustrated in discussions relating to the consumption of Scotch whisky, where the
945 perceived risk to health as a consequence of consuming an adulterated product was
946 considered to be low. In this instance, where importance was placed on the
947 consumption of the product for enjoyment and social engagement, the most
948 important product attribute was price rather than safety *per se*. This finding supports
949 Liu et al. (2015), which stipulates that Chinese consumer perceptions of authenticity
950 are multifaceted, with tolerance shown for fraud under some circumstances but not
951 in others. Acceptance was shown for mimicked products known in the Chinese
952 market as ‘Shanzhai’ products (own branded products that copy originals but with
953 reduced quality, which are more affordable than authentic products). Mimicked
954 products are associated with perceptions of a low level of authenticity due to their
955 openness in imitating the real product, whilst counterfeit or adulterated products are
956 unacceptable to Chinese consumers. However, it must be noted that this research
957 explored consumer attitudes towards goods and not food products. This response to
958 authenticity can also be explained by considering the Chinese Confucian cultural
959 value system. Within this belief system imitation of superiors is considered the
960 highest form of flattery and deemed practically and morally acceptable. However,
961 cheating, which is represented by the concealed nature of counterfeiting and fraud,
962 is condemned (Yau, 1988, Liu et al., 2015).

963

964 Limited consumer product category knowledge may offer an alternative explanation
965 for why consumer tolerance of fraud can be situationally/product dependant. Seitz
966 and Roosen (2015) present evidence to suggest Chinese consumers generally
967 possess low levels of knowledge regarding European food products. This was found

968 to be the case for olive oil and Scotch whisky, which despite purchasing for
969 perceived quality assurances, participants showed limited understanding of how the
970 respective products were best consumed and/or how high quality products are
971 identified, other than by relying on price as an indicator. In order to support
972 consumer identification of authentic products, exporters of European foods to China
973 are therefore advised to improve educational efforts surrounding product
974 characteristics, appropriate product use and means of identifying authentic products,
975 which would also further support product differentiation within the Chinese market.
976 As noted, the presence of branded retail outlets would be one way in which this
977 could be supported.

978 **5 CONCLUSIONS**

979 In China, historical regulatory inadequacies and persistent media reporting of food
980 safety incidents including fraud, has resulted in limited consumer trust in the
981 domestic food system. Despite significant regulatory reforms, fraudulent activity is
982 considered pervasive, although the associated risks are not well understood by
983 consumers. The common perception of food fraud is that it is a collective term
984 encompassing threats to the authenticity, safety, quality and reliability of food and a
985 primary barrier to the attainment of safe food. In response, consumers have
986 developed a variety of pre and post purchase and consumption strategies to
987 personally mitigate the risks associated with fraud. Low levels of trust in the
988 domestic market, as well as growing demand from middle class Chinese consumers
989 for authentic and safe food, represents significant market potential for high quality
990 European food exports. Exporters of European products looking to capitalise on
991 market opportunities in China are encouraged to recognise the breadth of strategies

992 adopted by Chinese consumers to ensure authentic and safe food, and consider the
993 impact of these for consumer communication and product distribution channels. At
994 the product level, this research highlights the importance integrity cues a key brand
995 protection mechanism and means of improving consumer trust. However, it is
996 essential that these align with consumer preferences and meet information
997 requirements in order to improve consumer trust in more sophisticated fraud
998 deterrence mechanisms. Finally, fraud perceptions were product and consumption
999 situation dependant. Improving Chinese consumer product category knowledge
1000 particularly for culturally unfamiliar products (i.e. olive oil and Scotch whiskey)
1001 will support consumers to make product authenticity and safety evaluations across a
1002 wider range of consumption situations and further increase brand reputation and
1003 trust.

1004 5.1 Limitations

1005
1006 This research has a number of limitations. First, this research was conducted prior to
1007 the 2015 Chinese Food Safety Law revisions, future research might therefore,
1008 usefully explore the impact that these reforms may have had upon consumer trust,
1009 in particular in relation to small and micro enterprises which dominate food
1010 production. Second, the research was conducted with participation of middle-class
1011 Chinese consumers as the intended consumers for European food and drink imports.
1012 Therefore, this does not take into consideration the views of consumers of lower
1013 socio-economic status, who may not possess the purchasing power to afford foods
1014 that provide better authenticity guarantees (i.e. European foods) and therefore, may
1015 be more vulnerable to experiencing fraud, may hold different attitudes towards food
1016 fraud and have alternative coping mechanisms to reduce the risks of purchasing
1017 unsafe food. Whilst this is not a limitation of the current research *per se*, it is

1018 important to highlight and future research might be encouraged to compare different
1019 consumer groups from different socio-economic segments. Whilst the intention of
1020 qualitative research is not to generalise the findings beyond the sample group, this
1021 research was conducted in three urban locations and therefore does not represent the
1022 views of consumers residing in other locations in China. Future research could
1023 therefore consider eliciting views from a broader range of geographical locations
1024 and explore the differences between consumers residing in urban and rural locales

1025

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1031

1032 **7 REFERENCES**

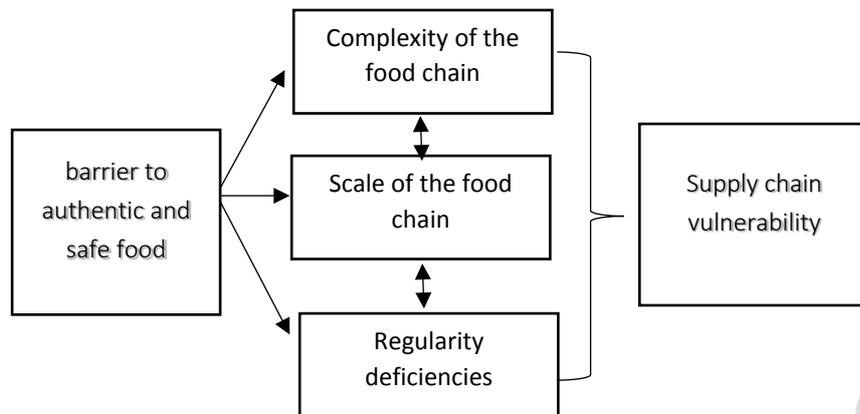
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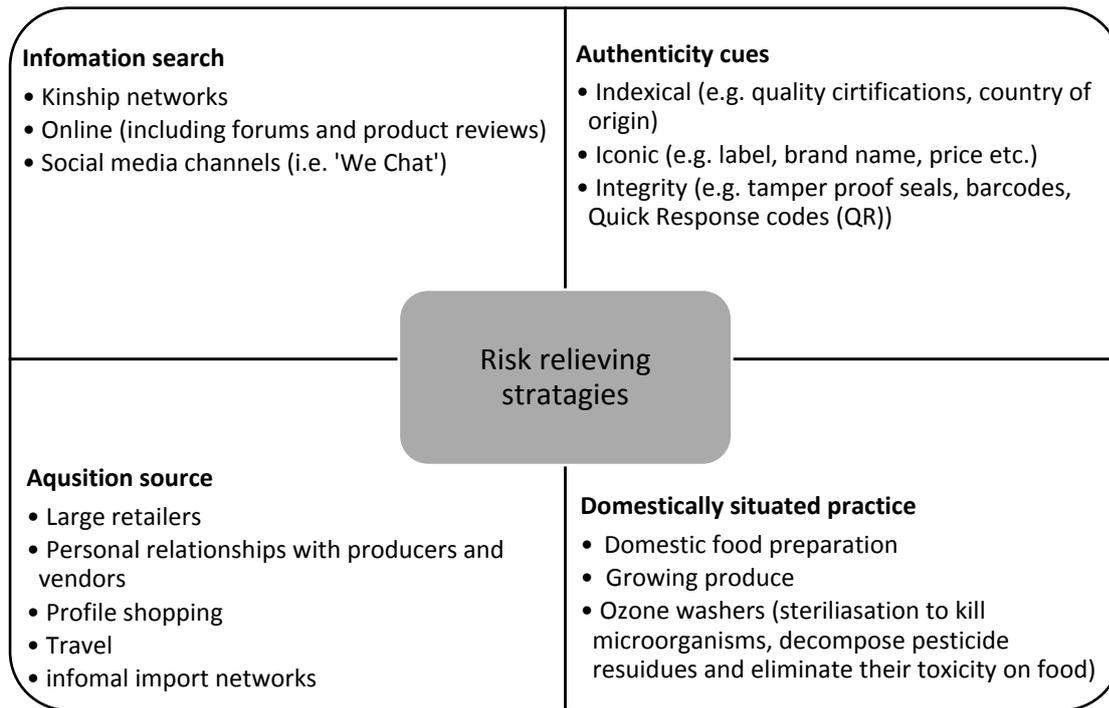
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Figure 1: Barriers to the attainment of authentic and safe food.

Note: Figure 1 illustrates the links between perceived barriers to the attainment of authentic and safe food, given the perceptual nature of the research these are not causal links.

Figure 2: Risk relieving strategies

Highlights

- Chinese consumers perceive food fraud to represent a risk to the safety of food
- To mitigate the perceived risks associate with food fraud, consumers developed a range of risk-relieving strategies
- The level of perceived risk posed by food fraud was product and consumption situation dependant

Table 1. Defining Food Fraud: Case examples from China

<i>Type of fraud</i>	<i>Definition</i>	<i>Example incidents in China and Chinese involvement in Europe.</i>	<i>Potential public health treat that could lead to illness or death</i>
<i>Counterfeiting</i>	All aspects of the fraudulent product and packaging are replicated.	In January 2017, 50 factories in the Northern Port City of Tianjin were raided and found to be manufacturing counterfeit condiments and seasonings imitating brands such as Nestle and Knorr. The products were found contain contaminants, including industrial grade salt and artificial flavourings (China Food and Drink Administration, 2017).	Fraudulent product with potential to include unknown contaminants and fraudulent components.
<i>Adulteration</i>	A process by which the quality of food is lowered either by the addition of inferior quality material or by extraction of valuable ingredient.	In 2008 melamine was added to infant formula milk to give the powder a higher apparent protein content. The incident affected the health of approximately 300,000 people (predominantly infants), resulted in the hospitalisation of 55,000 people and the death of 6 babies as a result of kidney failure (Veeck et al., 2010).	Unknown contaminant and fraudulent component.
<i>Mislabelling</i>	Making incorrect claims about the food, such as the geographical origin, the production method, or the best-before date.	In 2011, 110 people were arrested for the illegal sale of pork from pigs that had died as a result of disease rather than slaughtered in accordance with regulations. Consequently 1,000 tonnes of pork meat were confiscated. Sale and use of illegally recycled cooking oil known as “Gutter oil”. Oil is recovered from the drains outside restaurants, filtered and re-sold as fresh cooking fat. In 2011, 32	Fraudulent packaging information and inferior quality ingredients.

		<p>people were arrested and more than 100 tonnes of oil were seized across 14 provinces (BBC, 2011).</p> <p>In 2013, Chinese court sentences criminal to 4 years imprisonment and £50,000 fine for mislabelling cheap Chinese spirit as ‘Scotch Whisky’ (BBC, 2013).</p>	
<i>Diversión</i>	The sale or distribution of legitimate products outside of intended markets.	Relief foods directed to markets where aid is not required.	Shortages or delays in relief food to needy populations.
<i>Over-running</i>	A legitimate product is made in excess of production arrangements.	Under-reporting of production.	Fraudulent products are distributed outside of regulated or controlled supply chains.
<i>Simulation</i>	Illegitimate production is designed to look like but does not exactly copy the legitimate product, such as slightly changing the name.	“Knock-off” items produced without the same quality assurances. Bottles of ‘Glen Highland Green Blended Whisky’ seized from production in Fujian province in Southeast China. The bottles did not claim to be “Scotch Whisky” although the name insinuates Scottish origin (Bruce-Gardyne, 2015).	Fraudulent products are of inferior quality.
<i>Tampering</i>	Legitimate product and packaging are used in a fraudulent way.	Illegally made or unregulated alcoholic drinks are placed into genuine high-end bottles and passed off as high-end brands (Scotch Whisky Association, 2013). In 2014, in Guangdong province, police uncovered a gang operation that was refilling branded bottles with locally produced liquor in unsanitary conditions. Branded bottles were reported to be	Fraudulent packaging information and inferior product quality.

Theft

Legitimate product is stolen and passed off as being legitimately procured.

scavenged from bars or illegally purchased from bar staff (Fullerton, 2015).

Cargo theft introduced into commerce (Spink et al., 2015)

The fraudulent product is distributed outside of regulated or controlled supply chains.

Adapted from Spink and Moyer (2011)

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Table 2: European Food and Drink Product Focus

<i>Product</i>	<i>Brands</i>	<i>Consumers</i>	<i>Consumption Occasion</i>	<i>Implication in Food Fraud</i>	<i>Fraud prevention measures</i>	<i>Insights</i>
<i>Olive Oil</i>	<ul style="list-style-type: none"> - Mighty (produced in Spain, packaged in China) - Betis (Produced in Spain, Packaged in Spain) - Olive life (produced in China, packaged in China) 	Middle-class and high income consumers	Individual	Lower grade or adulterated oil passed off as extra virgin olive oil. “Gutter oil”, or illicit cooking oil that has been recycled from waste oil collected from restaurant fryers, drains, grease traps and slaughterhouse waste (Lu and Wu, 2014).	European Union’s system of approval guarantees product quality through certification. Protected Destination of Origin (PGO) and Protected Geographical Indication (PGI) has been granted for olive oils produced in Italy, Spain, France, Greece and Portugal.	<ul style="list-style-type: none"> i. The analysis of issues relating to traceability, including an understanding of labels, packaging, certifications, country of origin, brand, retail outlet and price; ii. The importance of authenticity where ‘health’ is an important attribute
<i>Scotch Whisky</i>	<ul style="list-style-type: none"> - Jonny Walker Red Label - Chivas Regal - Macallan 	Middle-class and high income consumers	Individual/Social	High value aspirational product has resulted in its implication in food fraud. SpiritsEurope estimate that 30% of ‘Scotch Whisky’ sold in China is fake (Scotch Whisky Association, 2013).	Scotch Whisky has protected geographical indication (GI) status in European law (EC Regulation 110/2008)’ which is also recognised in Chinese legislation and has provided the legal basis for the Scotch Whisky Association to work with Chinese	<ul style="list-style-type: none"> i. The importance of country of origin and PGI status as an indicator of authenticity. ii. Consumer concerns about the purchase and consumption of a high value product where counterfeiting has

Infant Formula Milk	- Beingmate (produced and packaged in China)	Infants	Individual	Melamine Scandal China (2008) 6 infants died as a result of renal failure and 54,000 were hospitalised. Resulted in a global ban on powdered milk products produced in China.	Formalisation of China's food safety laws. China's first food safety law became operational in 2009 and was revised in 2015 to give greater powers of prosecution to those involved in surveillance and enforcement.	iii. authorities to prosecute fraudulent activities on behalf of its members (Scotch Whisky Association, 2015).	iii. been demonstrated. The importance of consumption occasion in the purchase and decision making process.
	- Illumia (produced in Ireland packaged in China)					i. The importance of country of origin and traceability in purchase decisions	
	- Bimbosan (produced and packaged in Switzerland)					ii. The authenticity and integrity of a product category used by a 'vulnerable' target group.	
	- Pro-Kiddo (produced and packaged in China)						

(Source: adapted from Kendall et al. (2018))

Table 2: Focus group sample characteristics

<i>Focus Group location and theme</i>	<i>Focus Group number</i>	<i>Participant no.</i>	<i>Participant code</i>	<i>Age</i>	<i>Gender</i>	<i>Monthly Income (RMB ¥)</i>	<i>Weekly food spend (RMB ¥)</i>
Total	n=7	n=42	-	22-48	n=22 male n=20 female	10000-40000	1401-3500
Beijing: Scotch whisky and olive oil	1	n=6	Beijing G1 male	22-42	n=4 male n=2 female	15000-40000	1400-3000
			Beijing G1 female				
Beijing, Scotch whisky and olive oil	2	n=6	Beijing G2 male	24-48	n=2 male n=4 female	15000-30000	1400-3000
			Beijing G2 female				
Beijing, IMF and olive oil	3	n=6	Beijing G3 male	35-42	n=4 male n=2 female	15000-40000	1400-3500
			Beijing G3 female				
Chengdu, Scotch whisky and olive oil	4	n=6	Chengdu G4 male	24-37	n=2 male n=4 female	10000-16000	1200-1800
			Chengdu G4 female				
Chengdu, IMF and olive oil	5	n=6	Chengdu G5 male	25-36	n=4 male n=2 female	11000-20000	1200-2500
			Chengdu G5 female				
Guangzhou, IMF and olive oil	6	n=6	Guangzhou G6 male	29-36	n=4 female n=2 male	16000	1400-2000
			Guangzhou G6 female				
Guangzhou, Scotch whisky and olive oil	7	n=6	Guangzhou G7 male	29-36	n=4 male n=2 female	16000-18000	1400-2000
			Guangzhou G7 female				