



**QUEEN'S
UNIVERSITY
BELFAST**

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

Kendall, H., Kuznesof, S., Dean, M., Chan, M. Y., Clark, B., Home, R., Stolz, H., Zhong, Q., Liu, C., Brereton, P., & Frewer, L. (2019). Chinese consumer's attitudes, perceptions and behavioural responses towards food fraud. *Food Control*, 95, 339-351. <https://doi.org/10.1016/j.foodcont.2018.08.006>

Published in:
Food Control

Document Version:
Publisher's PDF, also known as Version of record

Queen's University Belfast - Research Portal:
[Link to publication record in Queen's University Belfast Research Portal](#)

Publisher rights

© 2018 The Authors.

This is an open access article published under a Creative Commons Attribution-NonCommercial-NoDerivs License (<https://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits distribution and reproduction for non-commercial purposes, provided the author and source are cited.

General rights

Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact openaccess@qub.ac.uk.



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

Helen Kendall^{a,*}, Sharron Kuznesof^a, Moira Dean^b, Mei-Yen Chan^c, Beth Clark^a, Robert Home^d, Hanna Stolz^d, Qiding Zhong^e, Chuanhe Liu^e, Paul Brereton^b, Lynn Frewer^a

^a School of Natural and Environmental Sciences, Newcastle University, Newcastle Upon-Tyne, NE1 7RU, UK

^b Centre for Global Food Security, Queen's University Belfast, University Road, Belfast, BT7 1NN, UK

^c Newcastle University International Singapore, SIT Building @ Nanyang Polytechnic, 172A Ang Mo Kio Avenue 8 #05-01, 567739, Singapore

^d Research Institute of Organic Agriculture (FiBL), Ackerstrasse 113 / Postfach 219, CH-5070, Frick, Switzerland

^e Chinese National Research Institute of Food and Fermentation Industries, No. 24 Jiu Xian Qiao Middle Road, Chaoyang District, Beijing, China

ARTICLE INFO

Keywords:

Food fraud
Economically motivated adulteration (EMA)
Consumers
Food risk
Trust

ABSTRACT

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

1. Introduction

Regulation of the food supply chain and food business operations are intended to protect public health by ensuring food to be safe for human consumption, and that products are traceable, appropriately labelled, and can be withdrawn or recalled if quality and/or safety is compromised (see. E.g. EC Regulation 178/2002). Such regulatory frameworks underpin consumer confidence and trust in the foods they purchase and consume (Garcia Martinez, Verbruggen, & Fearn, 2013). In environments where such regulations are either developing and/or a population does not fully trust or have confidence in the safety and integrity of their food supply, the question of how consumers make judgements about food safety and integrity arises. This paper addresses

this question through an analysis of Chinese consumers' attitudes towards, and perceptions of, food fraud and authenticity and considers their behavioural responses to limited trust in the domestic food system.

Chinese food production is associated with various characteristics that make it a suitable focus for this study. First, China's 'industrialisation' stage of economic growth and population expansion (expected to reach 1.3 billion by 2050 (Worldbank, 2017)), is placing significant demands on its agricultural system and food security (Jin & Jiang, 2002). To meet this increased demand, the domestic food chain has experienced rapid and often unregulated growth (Eves & Cheng, 2007; Ortega, Wang, Wu, & Olynk, 2011). Chinese food policy has historically prioritised the provision of adequate quantities of affordable food to meet rising domestic demand, often to the detriment of the

* Corresponding author.

E-mail address: helen.kendall@newcastle.ac.uk (H. Kendall).

<https://doi.org/10.1016/j.foodcont.2018.08.006>

Received 14 June 2018; Received in revised form 7 August 2018; Accepted 10 August 2018

Available online 13 August 2018

0956-7135/© 2018 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

environment and public health (Eves & Cheng, 2007; Ghose, 2014; Zhang, Xu, Oosterveer, & Mol, 2016). For example, at the farm level, pressures to increase yields have resulted in the over reliance on chemicals in production (Ma, Feng, Reidsma, Qu, & Heerink, 2014; Ortega et al., 2011). The consequences have been safety problems relating to the sale of vegetables tainted with hormones, pesticides and antibiotics. These are used to accelerate growth and improve appearance, at the same time, exceeding regulated limits and posing a potential risk to public health (Foster, 2011).

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

Third, regulation of the Chinese domestic food system was only relatively recently formalised (Jia & Jukes, 2013; Tang et al., 2015). The Chinese Food Safety Law (2009) represented the first legislative effort to regulate from production through to consumption (Pei et al., 2011; Zhang & Xue, 2016). This law created a state-level food safety commission to oversee implementation of the law. The law contained 104 articles outlining key provisions to address the supervision, monitoring and enforcement of food safety across China by identifying directives for product recall, traceability, licencing and standards development (Petry & Wu, 2009), and was arguably a response to the 2008 melamine in formula milk incident. The revised Food Safety Law (2015) addressed fragmented and unclear institutional responsibilities (Xue & Zhang, 2013), weak enforcement and inadequate penalties for those contravening the law (Jia & Jukes, 2013). The Law gave the authorities greater levels of power to prosecute violations and impose stricter penalties. Although it has been argued that China's current food safety regulations are one of the most stringent globally (Sim, 2016; Zhang et al., 2016), it will take time for the impacts of the 2015 revisions to be felt. Concerns remain regarding the capacity of the revised legislation to regulate large numbers of small supply chain actors (Zhang et al., 2016). Challenges can be identified around limited third party quality certification (Zhang et al., 2015), and lack of data and technology to support the identification of existing and emerging food safety risks, including food fraud (Tang et al., 2015).

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

Finally, from an industry perspective, following liberalisation, in recent decades China has become the "world factory" for both genuine and fake brands (Liu, Yannopoulou, Bian, & Elliott, 2015). Chinese consumers are exposed to a vast variety of domestically and internationally produced products, some of which are counterfeited, or mimicked (ibid). At the same time, China represents significant market development opportunities for food and drink companies. For example, China is Europe's second largest export market (after the USA). In 2016, agri-food exports accounted for 8.7% of all European products exported to China, an increase of 23.7% on the decade between 2006 and 2016,

with a value of €11, 385 billion (European Commission Directorate General For Trade, 2017). China's growing middle-class has significant purchasing potential, and demand for high quality and luxury foods are increasing, representing significant market potential for high quality European food exports (Eves & Cheng, 2007; Lomas, 2017). Therefore, understanding how Chinese consumers make food purchasing decisions could help European companies to differentiate their products and support consumers' judgements about food quality, reliability and safety.

Food authenticity is concerned with ensuring that food offered for sale or sold is of the "nature, substance and quality expected by the purchaser" (Section 14 Food Safety Act 1990). It provides a conceptual lens through which questions surrounding food fraud and safety can be explored and can allow consumers to objectively assess claims made by product manufacturers. There are two central perspectives on authenticity; i) objectivist and; ii) constructivist, both of which contribute to the identification of authentic products and help to develop and maintain consumer trust (Carsana & Jolibert, 2018; Kendall et al., 2018). Objectivist perspectives consider authenticity as a quality that can be measured by experts e.g. through verification using analytical methods to establish if a product's ingredients and stated origin are compliant with standards. In contrast, constructivist perspectives regard authenticity to be a projection of an individual's belief and expectations about a product (Carsana & Jolibert, 2018). This would be supported by the cues that companies use to enhance their consumers' confidence in the authenticity of their brands and products. Objective measures of authenticity are inherently difficult for consumers to verify (i.e. they are unable to easily perform the analytical tests required to establish if the composition of a product meets with the ingredients listed). Therefore, when making food purchase and consumption decisions, consumers more commonly rely upon constructivist cues provided by manufacturers as heuristics denoting a product's authenticity (Barnett et al., 2016; Carsana & Jolibert, 2018; Grayson & Martinec, 2004; Mccarthy & Henson, 2005). Some cues may provide added (objective) confidence although these are often difficult to verify through analytical methodology making them potentially vulnerable to fraud. For example, certification indicating compliance with standard schemes, such as, geographical area of production such as the European "Protected Geographical Indication" (PGI) or symbolic attributes of a product conveyed through the marketing and branding. Tangible (constructivist) cues such as tamper proof seals, QR codes, holograms, or customer care line information are an additional reassurance specifically designed to help consumers assess the integrity of a product at the point of purchase and consumption and act as a key deterrent to fraudsters. Whilst these may be subject to fraudulent practice, manufacturers can take measures to ensure that cues are difficult to replicate, providing the consumer with the most robust indication of a product's reliability and authenticity at the point of purchase (Kendall et al., 2018). Consumers are required to assimilate information provided by the objective, constructivists and integrity cues to help them make assessments regarding a products authenticity.

Conversely, an inauthentic product is created *via* the act of fraud, which can be defined as 'the deliberate and intentional substitution, addition, tampering, or misrepresentation of food, food ingredients, or packaging; or false or misleading statements made about a product for economic gain' (Spink & Moyer, 2011). Food may be adulterated in many ways. Table 1 presents common types of food fraud and where possible, provides illustrative examples from cases detected in the Chinese food supply chain.

Food fraud involves intentional and deliberate acts committed for economic gain (Spink & Moyer, 2011). The undisclosed and unknown nature of possible adulterants means that food fraud may, but does not always, pose significant risks to food safety (ibid). For example, the "horsemeat scandal" involved the intentional mislabelling of horse meat as beef, sold across Europe in 2013. Whilst this incident did not carry a significant public health risk, it challenged consumer's trust in

Table 1
Defining Food Fraud: Case examples from China.

| Type of fraud | Definition | Example incidents in China and Chinese involvement in Europe. | Potential public health treat that could lead to illness or death |
|----------------|--|---|--|
| Counterfeiting | 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. |
| Adulteration | 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 (Veck et al., 2010). | Unknown contaminant and fraudulent component. |
| Mislabelling | 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 1000 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 people were arrested and more than 100 tonnes of oil were seized across 14 provinces (BBC, 2011). . In 2013, Chinese court sentences criminal to 4 years imprisonment and £50,000 fine for mislabelling cheap Chinese spirit as ‘Scotch Whisky’ (BBC, 2013). | Fraudulent packaging information and inferior quality ingredients. |
| Diversion | 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. |
| Over-running | 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. |
| Simulation | 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. |
| Tampering | 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 scavenged from bars or illegally purchased from bar staff (Fullerton, 2015). | Fraudulent packaging information and inferior product quality. |
| Theft | Legitimate product is stolen and passed off as being legitimately procured. | 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).

the beef food chain, together with the integrity of the European food system as a whole (Barnett et al., 2016; Brooks, Elliott, Spence, Walsh, & Dean, 2017).

Fraudulent practices have been associated with many of China's recent food scares (see Table 1), with these typically uncovered through media reporting rather than official surveillance or government information dissemination. Zhang and Xue (2016) collated media reports of food fraud across China from 2004 to 2014 and identified 1553 reports of intentional food fraud. In 2007 alone, the Xinhua News Agency reported more than 60,000 fake food cases, with over 15,500 tons of substandard food being confiscated, and 180 food manufacturers identified as producing sub-standard food or using inedible ingredients in food manufacturing (Veck, Yu, & Burns, 2010). While the overall risk posed to society from malevolent activity in the food system may be assessed by experts to be low, media reporting serves to amplify public concern and compromise consumer trust (Kasperson et al., 1988).

However, Lord, Flores Elizondo, and Spencer (2017) and Van Ruth, Huisman, and Luning (2017) suggest that food fraud is not only committed by highly organised crime syndicates that infiltrate food systems (Elliott, 2014; Europol, 2015) but can also be perpetrated by legitimate actors in the food chain, who have access to a location where food fraud can be committed and where criminal opportunities arise to engage in

fraudulent practice alongside legitimate business operations. The regulatory difficulties arising from the scale of the Chinese food system, and associated challenges linked to inspection and regulation, has fostered an environment where food fraud has become an acceptable practice, even within legitimate food companies, as the 2008 melamine in powdered milk scandal highlighted (Zhang & Xue, 2016).

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

1.1. Consumer trust in Chinese Food chains

Consumer trust underpins consumer confidence in the food which they purchase and consume. In the absence of food risks, consumer trust in the food supply chain is typically high, and it is assumed that

actors in the food system, particularly those tasked with food-risk management, take an active role in protecting consumers (De Jonge et al., 2004). However, in China, numerous food safety incidents have undermined consumer trust in the domestic food system and the structures that govern it (Liu et al., 2014; Zhang et al., 2016).

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

The complexity of modern food systems means that food based interactions are typically conducted between strangers mediated by institutions including food manufacturers, regulators and enforcement services. Trust in organisations, such as these, is referred to as “institutional trust”, which is built and maintained through consumer perceptions that first, regulation, enforcement and surveillance systems are robust, and second, transparency in regulation and communication with consumers regarding the measures taken to protect their interests in relation to food and the absence of incidents (Barnett et al., 2016; Zhang et al., 2016). “Institutional trust” is communicated by signals, or heuristics, provided to consumers by manufacturers and regulators through, for example, quality certifications, packaging and labelling that support the evaluation of credence characteristics such as fair trade production claims (El Benni et al., 2019; Grayson & Martinec, 2004; Liu et al., 2015). However, institutional trust lacks face-to-face validity and is easily challenged or disrupted, through for example, the occurrence incidents that compromise the integrity of food, as has repeatedly been the case in China (see Table 1) (Lyon & Porter, 2007; Zhang et al., 2016). In these situations, consumers tend to revert to informal networks or alternative food networks to gather information relevant to the reduction of perceived risks associated with food. Indeed, there has been a reported increase in the prominence of alternative food networks in China in recent years (Kendall et al., 2018; Lyon & Porter, 2007; Zhang et al., 2016). To increase institutional trust, the Chinese government has introduced progressively more stringent regulation and enforcement activities (via the Food Safety Law 2009 and 2015) to improve domestic food safety standards and increase harmonisation with international standards, as well as to meet growing consumer demand for food safety improvements (Wang, Zhang, Mu, Fu, & Zhang, 2009).

Certification schemes have been introduced to compliment regulatory reforms and aim to improve food safety, reduce the ecological impact of food production, and improve consumer trust in food produced in China.¹ Standards and certifications do not relate directly to food fraud prevention. Nonetheless, they provide signals by which the consumer can objectively verify the quality of food and help to establish its reliability and rebuild trust in the integrity of the domestic food supply chain. However, very few products available to Chinese

¹ 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 substances. ‘Hazard Free Food’ designed to address the Chinese food safety ‘crisis’ and agro chemical contamination (Scott, Vandergeest, & Young, 2009). A wider range of agrochemicals 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.

consumers are certified, and multiple labels are used by manufacturers to represent the same certification (Mol, 2014). Moreover, imported food products carry additional certifications, signalling compliance with production standards in their country/region. For example, European products carry certifications that signify country of origin and production specifications (i.e. “Protected Destination of Origin” (PDO) and “Protected Geographic Indication” (PGI)). The proliferation of certifications included on food may cause consumer confusion (Scott, Si, Schumilas, & Chen, 2014). Consumers may be uncertain about the meaning and use of food certifications and safety labelling, and may distrust the authenticity of product certifications (Calvin et al., 2006), highlighting the widespread belief amongst Chinese consumers that certifications can be counterfeited and/or purchased, and therefore are not a reliable guarantee of food quality or safety (Zhang et al., 2016). In addition, transparency around food systems is not routinized or institutionalised, and actions taken to improve consumer protection have not been appropriately communicated to consumers (ibid), further adding to a lack of institutional trust.

Research conducted to date, exploring the drivers of Chinese consumer trust in the domestic food system, has primarily focused on understanding consumer attitudes towards traceability, including willingness-to-pay for food that can be traced through the supply chain and/or that carries product quality certifications, and credence attributes such as country of origin (see Bai, Zhang, and Jiang (2013), Zhang et al. (2012), El Benni et al. (2019), Ortega et al. (2011), Tang et al. (2015), Walley et al. (2014), Wu et al. (2011), Xu and Wu (2010), Xu, Zeng, Fong, Lone, and Liu (2012), Zhang et al. (2016)). Whilst these mechanisms help consumers to identify food that is safe, meets quality expectations and provides an objective basis upon which product claims might be assessed, food fraud has not been the explicit focus. This research seeks to address this gap by providing detailed baseline insights into how Chinese consumers perceive food fraud and the threats that emanate from malevolence in the food chain. In a situation where the perceived vulnerability to encountering fraud is regarded to be high, trust in the regulatory authorities to identify fraud and penalties given to those perpetrating fraud are considered to be low, we explore how consumers deal with information asymmetry and make food choice judgements, and in so doing, address the following research questions:

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

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

2. Method

To explore how middle-class Chinese consumers', as the intended target market for European food products, make decisions about the integrity of food that they purchase and consume, focus group methodology was employed. Focus groups capture of data regarding consumers' decisions and provide an opportunity to explore the social context in which they are made (Robinson, 1999). As carefully planned discussions which are conducted in a non-threatening environment (Krueger, 2014), focus groups are a well-established technique for eliciting attitudes and perceptions about abstract concepts which are

Table 2
European food and drink product focus.

| Product | Brands | Consumers | Consumption Occasion | Implication in Food Fraud | Fraud prevention measures | Insights |
|---------------------|--|--|----------------------|--|---|--|
| Olive Oil | <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 & 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 |
| Scotch Whisky | <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 authorities to prosecute fraudulent activities on behalf of its members (Scotch Whisky Association, 2015). | <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 been demonstrated. iii. The importance of consumption occasion in the purchase and decision making process. |
| Infant Formula Milk | <ul style="list-style-type: none"> - Beingmate (produced and packaged in China) - Illumia (produced in Ireland packaged in China) - Bimbosan (produced and packaged in Switzerland) - Pro-Kiddo (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. | <ul style="list-style-type: none"> i. The importance of country of origin and traceability in purchase decisions ii. The authenticity and integrity of a product category used by a ‘vulnerable’ target group. |

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

enhanced by group interactions (Kitzinger, 1994). The methodology has cross-cultural validity, and has been used in the Chinese cultural context to explore consumer food choices (Veeck et al., 2010) and perceptions of novel food production technologies (Perrea, Grunert, & Krystallis, 2015).

2.1. Procedure

Discussion guides were developed and refined based upon a review of the literature. Selected food products from Europe, available on the Chinese market, were used to focus and facilitate the discussion. Three product categories, i) Scotch whisky, ii) infant milk formula and iii) olive oil, were selected. The product categories were chosen on the basis of the contrasting perspectives that they offered to explore perceptions of food fraud and adulteration based upon: the products' food safety and adulteration histories in the EU and China; traceability-related labelling cues such as protected designation of origin (PDO) and country of origin references; product usage amongst different consumer groups with different vulnerabilities (i.e. infants); and use across diverse consumption occasions (Table 2). Product and brand choice² were based upon their availability and familiarity in the Chinese market, and differences in product origin and packaging. The Scotch whisky prompts were presented as pictures on laminated cards. Infant milk formula and olive oil products were shown to discussants.

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

The protocol was piloted via two focus groups with a convenience sample of Chinese students studying at the UK authors' university. Piloting was conducted to test procedural aspects of the protocol, and ensure questions were relevant to a Chinese sample. The discussion guide was translated into Chinese by the social research agency, Millward Brown, who provided recruitment and moderation support. For consistency across groups, the same moderator conducted all groups. A bilingual member of the project team back-translated the protocol to ensure that “meaning” was appropriately conveyed in Chinese. Ethical approval for the research was granted by the lead authors' university ethics committee in August 2014.

2.2. Sample

Seven focus groups were conducted in three Chinese cities in the North, South and East of China respectively, Beijing, Guangzhou and Chengdu. 42 participants took part in the study (Table 3). Two groups were held in each location. One group per protocol was conducted in each city, and an additional pilot group was held in Beijing, with no protocol amendments made to subsequent group discussions (group 1). Beijing and Guangzhou are first tier cities and represent the most economically developed regions in China with the most affluent consumers. Chengdu is a second tier city, and is a capital city at the provincial level and are considered to be developing. Consumer trends

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

mimic those in the first tier cities. Consistent with best practice, each focus group contained 6 participants recruited on demographic characteristics and purchasing habits, specifically gender (males and females), age (18–45 years), socio-economic status (middle/upper class); who had purchased infant formula milk, olive oil or Scotch whisky in the last three months; were the main or joint decision maker for food purchases in their home and had resided in their respective cities for 3 years or more.

All focus groups were held at the regional offices of the social research agency. To ensure quality of the data collected, members of the research team were present at each group. Discussions were simultaneously translated and observed by the research team via two-way glass. Each focus group lasted approximately 2 h, was digitally recorded and transcribed *verbatim* in Chinese, and translated into English for subsequent analysis. All participants were given an incentive payment for their contribution to the research, in line with typical remuneration for research participants in China. During discussions, notes were made by members of the project team on content, group dynamics and recurrent ideas and discussions that emerged across the groups. These preliminary reflections aided the first stage of the analysis process and helped to frame the concepts that were used to develop a systematic coding framework in stage one of the analysis. All data were collected in January 2015.

Data were analysed using analysis package QSR NVivo 11 (Nvivo, 2016). Analysis followed a three-stage process. First, three members of the project team (HK, SK and MD) independently undertook open coding of the transcripts using an inductive, grounded approach (Glaser & Strauss, 1967). This process involved each research reading each of the transcripts and identifying common themes across the groups for later discussion. Second, researchers (HK, SK and MD) met (February 2015) to discuss and consolidate the emerging key concepts, subsequently an initial coding framework developed by the lead researchers (HK and SK). Refinement of the coding framework involved two members of the research team (HK and SK) independently coding transcripts and comparing the codes against the framework. The final stage involved one researcher (HK) coding the full data set into the coding framework. The coding framework is available from the corresponding author upon request.

3. Findings

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

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

Respondents used food fraud as an umbrella term that encompassed concerns relating to the authenticity, safety, quality and the reliability of food. Herein food fraud will be defined in line with participant perceptions, as an *intentional action taken to deceive the consumer and compromise the authenticity, safety, quality and reliability of food*. In the absence of fraud, food was considered to be authentic i.e. was what it claimed to be, safe and of reliable quality. Across all groups, the potential risks that fraudulent activity in the food chain posed to the safety of food was of greatest concern.

Table 3
Focus group sample characteristics.

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

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

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

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

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

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

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

2) Barriers to the attainment of authentic and safe food

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

The highly fragmented structure of the Chinese food industry, characterised by a proliferation of small and medium-sized enterprises (SME), was considered to present significant regulatory challenges to reducing fraudulent practice. Rapid growth and development of the food system in recent decades was perceived to have placed considerable pressures on regulatory systems, and incentivised fraudsters. Effective regulation and enforcement was believed to be inhibited by the physical and financial capacity of multiple food regulation agencies to supervise food production and manufacturing, and enforce compliance with standards.

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

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

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

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

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

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

Disparities in regulatory standards, between cities and provinces in China and between Chinese and international standards were also

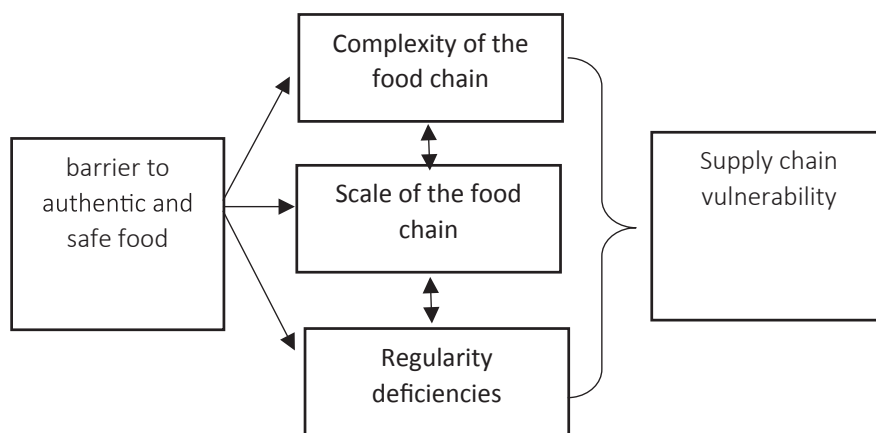


Fig. 1. Barriers to the attainment of authentic and safe food.

Note: Fig 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.

noted. More stringent regulation of food producers and manufacturers in higher tier cities were perceived to exist, as the following participant explains:

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

Discrepancies in food quality and safety (including authenticity) were identified between foods produced domestically and internationally, with respondents regarding food produced internationally, particularly in Europe to offer greater authenticity, quality and safety assurances.

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

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

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

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

3) Consequences for the consumer of food fraud

The implications of purchasing and consuming inauthentic food included both direct and indirect impacts, including illness, a loss of “face”, emotional harms and disempowerment through a lack of personal control in the provisioning of authentic and safe food. Consumers attributed food fraud to direct health risks, and cited the 2008 melamine in milk food scandal to illustrate the potential magnitude of the risks associated with food fraud. It was the perceived risk of harm from food fraud at the level of the family unit that posed greatest concern to participants. Concerns were expressed for the unknown, long-term, cumulative health impacts for infants and children whilst adults were identified as having greater resilience to impurities within their food. Responsibility for ensuring the integrity and safety of children's foods was identified as the sole responsibility of parents, and resulted in greater involvement in the purchase of goods intended for consumption

by infants and children.

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

Indirect impacts included the loss of “face” (accompanied by embarrassment, shame, and humiliation) emerged as a sub-theme and was considered a significant negative consequence of food that had been subjected to fraud. The Chinese cultural practice of gifting, expensive, well-presented (denoted by high quality packaging) goods, which signify the esteem of the giver to the recipient, is laden with “cultural affect”. Product authenticity as denoted by indexical attributes such as price, packaging and country of origin was therefore important in the observance of expected social conventions. Increased care was taken by consumers when selecting products suitable for “gifting” as it was socially unacceptable to give inauthentic gifts: *“we can't give counterfeits as gifts” (Chengdu, G4, Male)*. Encountering inauthentic food resulted in emotions of anxiety, anger, foolishness, embarrassment, anxiety and humiliation through being cheated, deceived and/or tricked by food producers and retailers, a sub-theme which emerged across all groups. The strength of these emotions and level of acceptance varied according to purchase and/or consumption situation. For example, the melamine adulterated infant milk formula in 2008 still provoked feelings of outrage by participants. However, in the case of Scotch whisky, there were social drinking occasions (i.e. when purchasing from bars) when participants were “resigned” to the likelihood that they would encounter “fake” whisky. Underpinning the potentially negative consequences of encountering food that is inauthentic was the perceived lack and/or loss of consumer control, which arose from inability to judge the authenticity and safety of food, compounded by the lack of transparency regarding the measures taken to protect consumer's interests in relation to food and the perceived lack of responsibility taken by food producers.

4) Risk relieving strategies

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

Due to imperfect knowledge about the authenticity of their food, and lack of trust in the regulatory environment, participants actively

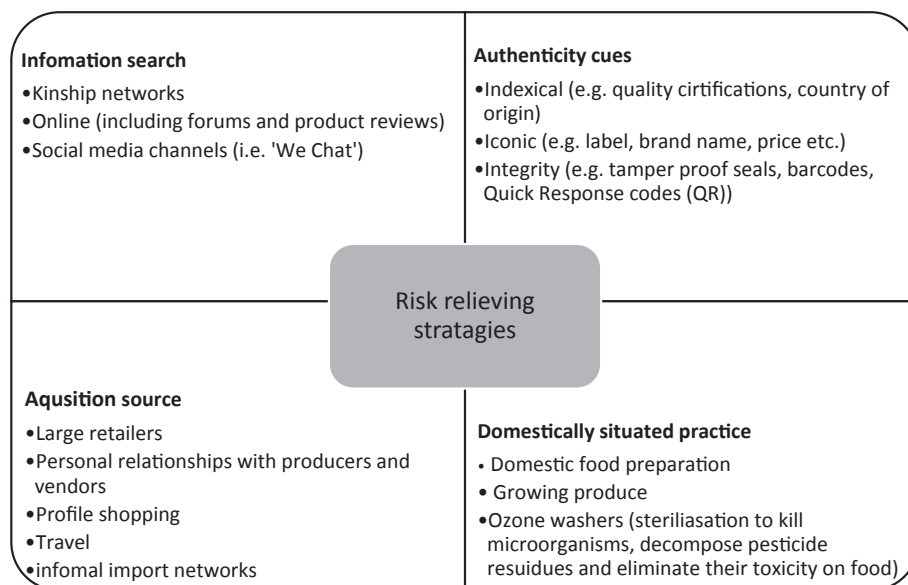


Fig. 2. Risk relieving strategies.

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

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

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

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

“I care about the body of bottle. Then I care about cap. Some fake wine

[spirits] is too ridiculous. It is very loose when you open it. [The] Chinese are genius at making counterfeits.” (Chengdu, G4, Female).

The acquisition source or place of purchase was important in determining the authenticity of food products. The reputation of the retailer provided a further mechanism for participants to overcome their uncertainty and risk perceptions associated with food fraud. Participants perceived smaller retailers as most likely to be implicated in fraudulent activity and largely avoided these. To alleviate concerns, participants purchased products from “trusted retailers”, which included, large, well-known retailers, for example premium supermarket chains such as OLE, or Carrefour, and department stores. Such retailers carried imported product lines and were acknowledged as “*more dependable to choose things from the foreign countries' goods shelf*” (Beijing, G3, Male). Discussants also reported that imported goods that had been produced and packaged outside of China, internationally branded goods produced domestically, and goods made internationally but packaged in China were avoided. Concerns regarding adulteration by Chinese actors involved in production and packaging were raised;

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

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

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

Consumer preference for imported products as the primary assurance against fraud, combined with the limited availability of imported products in the Chinese market, required consumers to look for alternative means to acquire their preferred and trusted brands. Participants reported two primary mechanisms, first, through travel to neighbouring states. For example, participants living in Guangzhou reported travelling to Hong Kong and Macau for infant milk formula. Second, *via* trusted kinship networks that extended into foreign countries where infant milk formula was purchased and shipped back to China. The additional expense of this practice and the potential unreliability was

noted, although accepted, in order to guarantee authenticity and safety of products, particularly those intended for infants.

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

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

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

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

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

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

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

4. Discussion

The Chinese domestic food supply chain has been beset with incidents that have undermined its integrity and led to widespread consumer anxiety and reduced trust regarding the authenticity, safety and quality of food that is available. This research indicates that despite significant reforms to food safety governance in China implemented by respective food safety acts (The Food Safety Law 2009 and 2015), Chinese consumer trust in the domestic food system remains low. High profile food safety incidents, of which many represent cases of fraud, highlight the pervasive nature of fraudulent activity within Chinese food chains. Incidents have been shown to be perpetrated by both criminals that have infiltrated legitimate food chains and legitimate actors within legitimate food chains, as the 2008 melamine scandal illustrated and is recognised to be a significant factor in low levels of consumer trust in the food systems and its governance (Elliott, 2014, Lord et al., 2017, Van Ruth et al., 2017). Post melamine, continued widespread media reporting of food fraud incidents has amplified

societal risks response, and further heightened consumer concerns regarding the risks that fraud poses to the attainment of safe food (Kasperson et al., 1988). Despite this, a limited body of literature has sought to explore the wider implications of food fraud for Chinese consumers (El Benni et al., 2019).

Whilst there are accepted differences between the concepts of food fraud, food safety, food authenticity and food quality (Spink et al., 2015), a significant finding of this research, is that Chinese consumers do not distinguish between these concepts, rather, they considered food fraud to be a term, encompassing risks to all of these and ultimately the attainment of safe food. The potential for unknown contaminants to be present, and evidence of significant health implications linked to previous incidents, resulted in Chinese consumers perceiving food fraud to represent a risk to the general safety of their food. This is consistent with previous research that found food safety to be the most significant safety concern of Chinese consumers, which encompassed “counterfeit” and “inferior quality” food as the issues that the Chinese public were most concerned about (see Liu et al., 2014).

The lack of trust in the Chinese food system was linked to a variety of factors: first, the high prevalence of food safety incidents in China and representation of these in the media, many of which are classified as cases of fraud. Second, the perceived historical leniency of the Chinese government to regulate the domestic food system as well as regulatory disparities nationally. Third, the challenges associated with the regulation of a large, complex and fragmented system. Fourth, the perceived lack of transparency regarding measures taken to protect consumers' interest in relation to food; and finally, the perceived lack of organisational accountability taken when foods do not meet with consumers' quality expectations.

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

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

Consumers recognised the challenges inherently associated with the regulation of a large and fragmented food chain and identified this to be a key barrier to the attainment of authentic and safe food. Despite efforts to harmonise standards nationally and internationally, disparities in the quality of regulation between cities and provinces were identified (see Tam and Yang (2005). To account for the dispersed nature of food supply chains, further improvements were considered necessary to improve consistency of risk management in lower tier cities with first tier cities, and improve food regulation and enforcement in these cities, which were identified as being the most vulnerable to fraud. Research conducted by Kendall et al. (2018) indicates that consumers in lower tier Chinese cities perceive the greatest risk to the authenticity and safety of food as a result of fraud, however, they also found that structural trust was not a significant predictor of attitude and intention to purchase authenticated food.

The range of behavioural response strategies to personally mitigate

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

Consumer preference for imported foods over domestic products were shown despite the acknowledged price premium. It is recognised that Chinese consumers regard European products to offer greater quality and safety assurances than domestically produced alternatives and demonstrate a desire for domestically produced products to reach the same level of production quality and safety (El Benni et al., 2019; Liu et al., 2014; Qiao, Guo, & Klein, 2012). Within this research, European products, in particular well recognised European brands, were reported to be sought wherever possible with preference shown for brands that were ‘truly foreign’, abating concerns regarding tampering and adulteration during the production process. This supports the findings of Liu et al. (2015) who identified consumers made distinctions between the level of authenticity of branded products of those that are made in foreign markets versus those that produced in China. Authentic brands manufactured in their originating country were deemed to have a higher level of authenticity than those produced in an inauthentic country of manufacture. For example, German infant milk brand Aptimil produced in Germany was regarded to be more authentic than the identical product formulation produced by the same company in China. Although the methods adopted in this research do not permit quantification, consumers expressed willingness to pay for imported products that better met authenticity requirements.

The importance of interpersonal relationships in aiding the identification and acquisition of reliable products (including European products) were identified. The absence of trust in food chain actors resulted in the elevated importance of kinship networks, including social media channels in identifying authentic products, trusted retailers and sourcing products. The reliance on kinship networks has been shown to be a reaction to the lack of formal systems designed to protect consumers, or a response to disruptions the food chain, through for example, reported instances of fraud (Lyon & Porter, 2007). This may also reflect the collectivist nature of Chinese society, which places cultural value on kinship relations, with consumers shown to rely more on interpersonal rather than formal communications (Yau, 1988). The size of the Chinese market coupled with domestic distrust represents significant market potential for high quality European food exports, and industry actors must recognise the importance of informal channels as valued information sources by Chinese consumers. As a result, they should utilise these channels (particularly social media platforms) to disseminate information regarding the measures taken to deter fraud and better support consumer identification of authentic products.

Consumers showed a preference for large retailers including international supermarkets over small independent retailers or street vendors which were identified to be likely to be implicated in fraudulent practice (see also Xia and Zeng (2006)). Large retailers were considered to offer wider product ranges, including reputable supplies of imported food product, and offering greater assurances of product authenticity. Consumers regarded these large retailers to be within the regulatory control of government and their international reputations a key fraud deterrent mechanism, as well as making them more responsive if products failed to meet expectations. European food importers must recognise the strength of large retailers as preferred distribution channels

for imported products. That said, the importance of developing strong personal relationships with suppliers and brands was also recognised, with consumers valuing relationships with primary producers, reflected in the growing prominence of alternative food networks in China (see for example, Sausmikat (2015) and Zhang et al. (2016)). The presence of brand stores, particularly in the case of Scotch whisky and olive oil, in addition to presence in large retailers was identified by Chinese consumers as supporting the identification authentic and safe products. European exporters of olive oil and Scotch whisky, are encouraged to consider independent distribution channels as an important mechanism for increasing brand presence, reputation and consumer trust and loyalty, as well as a crucial means of building product category knowledge. This will improve brand protection by supporting Chinese consumers to more confidently identify authentic products and whistle blow where products fail to meet brand standards.

At the product level, constructed cues of authenticity were used as one element of the wider risk relieving strategies adopted by Chinese consumers to support the identification of authentic products. Consumers had greatest trust in cues that were difficult to replicate and as noted, country of origin was considered a key attribute relied upon to support authenticity and quality assessments. Whilst considerable research has been conducted exploring Chinese consumers' willingness-to-pay for traceability and foods of certified quality (see El Benni et al., 2019; Tang et al., 2015; Wu et al., 2011; Xu & Wu, 2010; Xu et al., 2012), this research highlighted consumer reliance on traditional indicators of product quality, such as price, which were used to make inferences regarding authenticity and safety. Certifications and cues of integrity were not often used despite these offering the most robust indication at the point of purchase of a products authenticity and safety and the ability to objectively verify these, Chinese consumers noted the sophistication of fraudsters and expressed concerns that these could also be falsified (see also Cheng (2011)).

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

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

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

Limited consumer product category knowledge may offer an alternative explanation for why consumer tolerance of fraud can be situationally/product dependant. Seitz and Roosen (2015) present evidence to suggest Chinese consumers generally possess low levels of knowledge regarding European food products. This was found to be the case for olive oil and Scotch whisky, which despite purchasing for perceived quality assurances, participants showed limited understanding of how the respective products were best consumed and/or how high quality products are identified, other than by relying on price as an indicator. In order to support consumer identification of authentic products, exporters of European foods to China are therefore advised to improve educational efforts surrounding product characteristics, appropriate product use and means of identifying authentic products, which would also further support product differentiation within the Chinese market. As noted, the presence of branded retail outlets would be one way in which this could be supported.

5. Conclusions

In China, historical regulatory inadequacies and persistent media reporting of food safety incidents including fraud, has resulted in limited consumer trust in the domestic food system. Despite significant regulatory reforms, fraudulent activity is considered pervasive, although the associated risks are not well understood by consumers. The common perception of food fraud is that it is a collective term encompassing threats to the authenticity, safety, quality and reliability of food and a primary barrier to the attainment of safe food. In response, consumers have developed a variety of pre and post purchase and consumption strategies to personally mitigate the risks associated with fraud. Low levels of trust in the domestic market, as well as growing demand from middle class Chinese consumers for authentic and safe food, represents significant market potential for high quality European food exports. Exporters of European products looking to capitalise on market opportunities in China are encouraged to recognise the breadth of strategies adopted by Chinese consumers to ensure authentic and safe food, and consider the impact of these for consumer communication and product distribution channels. At the product level, this research highlights the importance integrity cues a key brand protection mechanism and means of improving consumer trust. However, it is essential that these align with consumer preferences and meet information requirements in order to improve consumer trust in more sophisticated fraud deterrence mechanisms. Finally, fraud perceptions were product and consumption situation dependant. Improving Chinese

consumer product category knowledge particularly for culturally unfamiliar products (i.e. olive oil and Scotch whiskey) will support consumers to make product authenticity and safety evaluations across a wider range of consumption situations and further increase brand reputation and trust.

5.1. Limitations

This research has a number of limitations. First, this research was conducted prior to the 2015 Chinese Food Safety Law revisions, future research might therefore, usefully explore the impact that these reforms may have had upon consumer trust, in particular in relation to small and micro enterprises which dominate food production. Second, the research was conducted with participation of middle-class Chinese consumers as the intended consumers for European food and drink imports. Therefore, this does not take into consideration the views of consumers of lower socio-economic status, who may not possess the purchasing power to afford foods that provide better authenticity guarantees (i.e. European foods) and therefore, may be more vulnerable to experiencing fraud, may hold different attitudes towards food fraud and have alternative coping mechanisms to reduce the risks of purchasing unsafe food. Whilst this is not a limitation of the current research *per se*, it is important to highlight and future research might be encouraged to compare different consumer groups from different socio-economic segments. Whilst the intention of qualitative research is not to generalise the findings beyond the sample group, this research was conducted in three urban locations and therefore does not represent the views of consumers residing in other locations in China. Future research could therefore consider eliciting views from a broader range of geographical locations and explore the differences between consumers residing in urban and rural locales.

Acknowledgements

This research was conducted in the framework of the EU-project FoodIntegrity (Grant Agreement: 613688). This publication reflects the views only of the authors, and the European Commission cannot be held responsible for any use which may be made of the information contained therein.

References

- Bai, J., Zhang, C., & Jiang, J. (2013). The role of certificate issuer on consumers' willingness-to-pay for milk traceability in China. *Agricultural Economics*, 44, 537–544.
- Barnett, J., Begeen, F., Howes, S., Regan, A., Mcconnon, A., Marcu, A., et al. (2016). Consumers' confidence, reflections and response strategies following the horsemeat incident. *Food Control*, 59, 721–730.
- BBC. *Mass arrests in China illegal 'gutter oil' police sting [Online]*. (2011). Available <http://www.bbc.co.uk/news/world-asia-pacific-14894070> Accessed 22nd November 2017.
- BBC. *Chinese court jails fake Scotch whisky seller.[Online]*. (2013). Available <http://www.bbc.co.uk/news/uk-scotland-scotland-business-21194829> Accessed 22nd November 2017.
- Brooks, S., Elliott, C. T., Spence, M., Walsh, C., & Dean, M. (2017). Four years post-horsemeat: An update of measures and actions put in place following the horsemeat incident of 2013. *npj Science of Food*, 1, 5.
- Bruce-Gardyne. *The battle against fake scotch [Online]*. (2015). Available <https://scotchwhisky.com/magazine/features/7549/the-battle-against-fake-scotch> Accessed 22nd November 2017.
- Calvin, L., Gale, F., Hu, D., & Lohmar, B. (2006). Food safety improvements underway in China. *Amber Waves*, 4, 16.
- Carsana, L., & Jolibert, A. (2018). Influence of iconic, indexical cues, and brand schematicity on perceived authenticity dimensions of private-label brands. *Journal of Retailing and Consumer Services*, 40, 213–220.
- Cheng, H. (2011). Cheap capitalism: A national study of food crime in China. *British Journal of Criminology*, 52, 254–273.
- China Food And Drink Administration. *Food and Drink Administration ordered Tianjin to verify reports of counterfeit seasoning severely punished violations [Online]*. (2017). Available <http://www.sda.gov.cn/WS01/CL0050/168598.html> Accessed 22nd November 2017.
- De Jonge, J., Frewer, L., Van Trijp, H., Jan Renes, R., De Wit, W., & Timmers, J. (2004). Monitoring consumer confidence in food safety: An exploratory study. *British Food Journal*, 106, 837–849.
- El Benni, N., Stolz, H., Home, R., Kendall, H., Kuznesof, S., Clark, B., et al. (2019). Product

- attributes and consumer attitudes affecting the preferences for infant milk formula in China—a latent class approach. *Food Quality and Preference*, 71, 25–33.
- Elliott, C. (2014). *Elliott review into the integrity and assurance of food supply networks-final report: A national food crime prevention framework, department for environment*. Food & Rural Affairs Food Standards Agency.
- European Commission Directorate General For Trade (2017). *European union, trade in goods with China*.
- Europol (2015). *2015 situation report on counterfeiting in the European union a joint project between Europol and the office for harmonization in the internal market*.
- Eves, A., & Cheng, L. (2007). Cross-cultural evaluation of factors driving intention to purchase new food products—Beijing, China and south-east England. *International Journal of Consumer Studies*, 31, 410–417.
- Foster, P. **Top 10 Chinese food scandals [Online]. (2011)**. Available <http://www.telegraph.co.uk/news/worldnews/asia/china/8476080/Top-10-Chinese-Food-Scandals.html> Accessed 22nd May 2018.
- Fullerton, J. *Bathub booze and knock-off whisky: Inside China's fake alcohol industry [Online]. (2015)*. Available <https://www.theguardian.com/sustainable-business/2015/sep/16/china-fake-alcohol-industry-counterfeit-bathub-booze-whisky> Accessed 22nd November 2017.
- Garcia Martinez, M., Verbrugge, P., & Fearnle, A. (2013). Risk-based approaches to food safety regulation: What role for co-regulation? *Journal of Risk Research*, 16, 1101–1121.
- Ghose, B. (2014). Food security and food self-sufficiency in China: From past to 2050. *Food and Energy Security*, 3, 86–95.
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory Chicago*. USA: Adeline.
- Grayson, K., & Martinec, R. (2004). Consumer perceptions of iconicity and indexicality and their influence on assessments of authentic market offerings. *Journal of Consumer Research*, 31, 296–312.
- Jia, C., & Jukes, D. (2013). The national food safety control system of China—a systematic review. *Food Control*, 32, 236–245.
- Jin, J., & Jiang, C. (2002). Spatial variability of soil nutrients and site-specific nutrient management in the PR China. *Computers and Electronics in Agriculture*, 36, 165–172.
- Kasperson, R. E., Renn, O., Slovic, P., Brown, H. S., Emel, J., Goble, R., et al. (1988). The social amplification of risk: A conceptual framework. *Risk Analysis*, 8, 177–187.
- Kendall, H., Naughton, P., Kuznesof, S., Raley, M., Dean, M., Clark, B., et al. (2018). Food fraud and the perceived integrity of European food imports into China. *PLoS One*, 13, e0195817.
- Kitzinger, J. (1994). The methodology of focus groups: The importance of interaction between research participants. *Sociology of Health & Illness*, 16, 103–121.
- Krueger, R. A. (2014). *Focus groups: A practical guide for applied research*. Sage publications.
- Lam, H.-M., Remais, J., Fung, M.-C., Xu, L., & Sun, S. S.-M. (2013). Food supply and food safety issues in China. *The Lancet*, 381, 2044–2053.
- Liu, R., Pieniak, Z., & Verbeke, W. (2014). Food-related hazards in China: Consumers' perceptions of risk and trust in information sources. *Food Control*, 46, 291–298.
- Liu, M. J., Yannopoulou, N., Bian, X., & Elliott, R. (2015). Authenticity perceptions in the Chinese marketplace. *Journal of Business Research*, 68, 27–33.
- Lomas, M. *Chinese consumers will change the global economy [Online]. (2017)*. Available <https://thediplomat.com/2017/04/chinese-consumers-will-change-the-global-economy/> Accessed 22nd November 2017.
- Lord, N., Flores Elizondo, C. J., & Spencer, J. (2017). The dynamics of food fraud: The interactions between criminal opportunity and market (dys) functionality in legitimate business. *Criminology and Criminal Justice*, 17, 605–623.
- Luhmann, N. (2000). Familiarity, confidence, trust: Problems and alternatives. *Trust: Making and breaking cooperative relations*, 6, 94–107.
- Lu, F., & Wu, X. (2014). China food safety hits the "gutter". *Food Control*, 41, 134–138.
- Lyon, F., & Porter, G. (2007). Market institutions, trust and norms: Exploring moral economies in Nigerian food systems. *Cambridge Journal of Economics*, 33, 903–920.
- Ma, L., Feng, S., Reidsma, P., Qu, F., & Heerink, N. (2014). Identifying entry points to improve fertilizer use efficiency in Taihu Basin, China. *Land Use Policy*, 37, 52–59.
- Mccarthy, M., & Henson, S. (2005). Perceived risk and risk reduction strategies in the choice of beef by Irish consumers. *Food Quality and Preference*, 16, 435–445.
- Mol, A. P. (2014). Governing China's food quality through transparency: A review. *Food Control*, 43, 49–56.
- Nvivo (2016). *NVivo qualitative data analysis Softwar*. QSR International Pty Ltd.
- O'Brien, E. *Cracking down on China's dangerous fake food sector [Online]. (2017)*. Available <https://www.independent.co.uk/news/world/asia/china-fake-food-sector-unlicensed-products-knock-offs-supply-chain-contamination-public-health-a7880341.html> Accessed 11th May 2018.
- Ortega, D. L., Wang, H. H., Wu, L., & Olynk, N. J. (2011). Modeling heterogeneity in consumer preferences for select food safety attributes in China. *Food Policy*, 36, 318–324.
- Pei, X., Tandon, A., Alldrick, A., Giorgi, L., Huang, W., & Yang, R. (2011). The China melamine milk scandal and its implications for food safety regulation. *Food Policy*, 36, 412–420.
- Perrea, T., Grunert, K. G., & Krystallis, A. (2015). Consumer value perceptions of food products from emerging processing technologies: A cross-cultural exploration. *Food Quality and Preference*, 39, 95–108.
- Petry, M., & Wu, B. (2009). *Food safety law of the People's Republic of China* USDA Foreign Agricultural Service GAIN Report CH9019.
- Qiao, G., Guo, T., & Klein, K. (2012). Melamine and other food safety and health scares in China: Comparing households with and without young children. *Food Control*, 26, 378–386.
- Renn, O. (2004). Perception of risks. *Toxicology Letters*, 149, 405–413.
- Robinson, N. (1999). The use of focus group methodology—with selected examples from sexual health research. *Journal of Advanced Nursing*, 29, 905–913.
- Scotch Whisky Association. *Global [Online]. (2013)*. Available <http://www.scotch-whisky.org.uk/news-publications/publications/documents/legal-report-2015-16/#.WQxc9T-GNHg> Accessed 24th January 2018.
- Scott, S., Si, Z., Schumilas, T., & Chen, A. (2014). Contradictions in state-and civil society-driven developments in China's ecological agriculture sector. *Food Policy*, 45, 158–166.
- Scott, S., Vandergeest, P., & Young, M. (2009). Certification standards and the governance of green foods in Southeast Asia. *Corporate power in global agrifood governance* (pp. 61).
- Seitz, C. C., & Roosen, J. (2015). An empirical analysis of international consumers' associations with Bavarian food products by means of concept mapping. *British Food Journal*, 117, 987–1006.
- Siegrist, M., & Cvetkovich, G. (2000). Perception of hazards: The role of social trust and knowledge. *Risk Analysis*, 20, 713–720.
- Sim, A. A. Y. Y. *China: An overview of the new food safety law [Online]. (2016)*. Available <https://www.foodsafetymagazine.com/enewsletter/china-an-overview-of-the-new-food-safety-law/> Accessed 22nd November 2017.
- Spink, J., & Moyer, D. C. (2011). Defining the public health threat of food fraud. *Journal of Food Science*, 76.
- Spink, J., Moyer, D. C., Park, H., Wu, Y., Fersht, V., Shao, B., et al. (2015). Introducing Food Fraud including translation and interpretation to Russian, Korean, and Chinese languages. *Food Chemistry*, 189, 102–107.
- Tam, W., & Yang, D. (2005). Food safety and the development of regulatory institutions in China. *Asian Perspective*, 5–36.
- Tang, Q., Li, J., Sun, M., Lv, J., Gai, R., Mei, L., et al. (2015). Food traceability systems in China: The current status of and future perspectives on food supply chain databases, legal support, and technological research and support for food safety regulation. *Bioscience trends*, 9, 7–15.
- Van Rijswijk, W., Frewer, L. J., Menozzi, D., & Faioli, G. (2008). Consumer perceptions of traceability: A cross-national comparison of the associated benefits. *Food Quality and Preference*, 19, 452–464.
- Van Ruth, S. M., Huisman, W., & Luning, P. A. (2017). Food fraud vulnerability and its key factors. *Trends in Food Science & Technology*, 67, 70–75.
- Veeck, A., Yu, H., & Burns, A. C. (2010). Consumer risks and new food systems in urban China. *Journal of Macromarketing*, 30, 222–237.
- Walley, K., Custance, P., Feng, T., Yang, X., Cheng, L., & Turner, S. (2014). The influence of country of origin on Chinese food consumers. *Transnational Marketing Journal*, 2, 78–98.
- Wang, F., Zhang, J., Mu, W., Fu, Z., & Zhang, X. (2009). Consumers' perception toward quality and safety of fishery products, Beijing, China. *Food Control*, 20, 918–922.
- Worldbank. *China country profile [Online]. (2017)*. Available http://databank.worldbank.org/data/Views/Reports/ReportWidgetCustom.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=n&zm=n&country=CHN Accessed 22nd November 2017.
- Wu, L., Xu, L., & Gao, J. (2011). The acceptability of certified traceable food among Chinese consumers. *British Food Journal*, 113, 519–534.
- Wu, L., Zhang, Q., Shan, L., & Chen, Z. (2013). Identifying critical factors influencing the use of additives by food enterprises in China. *Food Control*, 31, 425–432.
- Xia, W., & Zeng, Y. (2006). *Consumer's attitudes and willingness-to-pay for Green food in Beijing*.
- Xue, J., & Zhang, W. (2013). Understanding China's food safety problem: An analysis of 2387 incidents of acute foodborne illness. *Food Control*, 30, 311–317.
- Xu, L., & Wu, L. (2010). Food safety and consumer willingness to pay for certified traceable food in China. *Journal of the Science of Food and Agriculture*, 90, 1368–1373.
- Xu, P., Zeng, Y., Fong, Q., Lone, T., & Liu, Y. (2012). Chinese consumers' willingness to pay for green-and eco-labeled seafood. *Food Control*, 28, 74–82.
- Yau, O. H. (1988). Chinese cultural values: Their dimensions and marketing implications. *European Journal of Marketing*, 22, 44–57.
- Zhang, C., Bai, J., & Wahl, T. I. (2012). Consumers' willingness to pay for traceable pork, milk, and cooking oil in Nanjing, China. *Food Control*, 27, 21–28.
- Zhang, M., Hui, Q., Xu, W., Pu, M.-Z., Yu, Z.-J., & Zheng, F.-T. (2015). The third-party regulation on food safety in China: A review. *Journal of Integrative Agriculture*, 14, 2176–2188.
- Zhang, W., & Xue, J. (2016). Economically motivated food fraud and adulteration in China: An analysis based on 1553 media reports. *Food Control*, 67, 192–198.
- Zhang, L., Xu, Y., Oosterveer, P., & Mol, A. P. (2016). Consumer trust in different food provisioning schemes: Evidence from Beijing, China. *Journal of Cleaner Production*, 134, 269–279.