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Exploring Chinese Consumers' Attitudes Towards Traceable Dairy Products: A Focus Group Study

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Abstract

Dairy products are an essential part of a healthy diet, and dairy is an emerging food industry in China. With rapid economic development, Chinese consumers are increasingly health-conscious and are becoming more selective about the quality and safety of dairy products. Adopting a qualitative approach, we explored Chinese consumers' perception of dairy food safety and attitudes towards traceable dairy products through nine focus group interviews administered in four urban locations in North and South China, with a total of 61 participants. Results showed that a high prevalence of food safety incidents triggers consumers to lower their confidence in food safety and to pay more attention to the news about food safety incidents in the media, including social media. Chemical residues ranked as the first concern on food safety in the dairy industry. Meanwhile, traceable dairy products were not well known among consumers. Although the possibility to trace back all stages of the food supply chain in the dairy sector was considered important, respondents raised doubts about the truthfulness of traceability information.

Keywords: Dairy products, Food traceability, Consumer perception, Focus group

26 INTRODUCTION

27 Dairy products are essential components of the diets, and there has been an upsurge in
28 consumption worldwide, especially in developing countries (Handford, Campbell, & Elliott, 2016).
29 The dairy industry in China is new, with huge development potential as part of China's food
30 industry, also thanks to strong government support (Wu et al., 2018). As the developing country
31 with the largest world population, there is a great demand for dairy products in China. According to
32 forecasts, 2018 consumption of milk will reach 41 million tons, about 9.5 per cent higher than in
33 2017 (Ward & Inouye, 2018). Nevertheless, with the rapid development of the dairy industry in
34 China, many problems concerning safety and quality management have arisen. Dairy quality and
35 safety have emerged as crucial issues because food safety incidents occur more frequently in this
36 supply chain, thus causing consumers to lose their confidence in the dairy industry.

37 To reduce food safety risks and prevent serious food safety incidents, as well as enhance
38 consumer confidence in food safety, the Chinese Government has undertaken various policy
39 measures to improve the safety and quality of dairy products in recent years. Establishing a food
40 traceability system (FTS) is one of the top policy tools to attain this goal (Zhang, Bai, & Wahl,
41 2012). However, traceability is not a mandatory requirement for suppliers in the whole dairy
42 industry in China but only for infant formula milk powder.

43 Implementation of traceability systems could lead to higher production and distribution costs,
44 thus to higher prices of products, and price perception would directly influence demand and
45 customer satisfaction. On the other side, it may lead consumers to perceive a higher value and to be
46 willing to pay a premium price for dairy products. Therefore, firms working in the food business
47 have to compare potential benefits and costs.

48 It is important to understand consumers' awareness of the quality and safety of dairy products,
49 purchasing behaviour, and attitudes towards traceable dairy products to implement an FTS in the

50 dairy industry. Furthermore, it is necessary to know consumers' perceptions of the authenticity of
51 traceability information.

52 Driven by frequent food safety incidents, a large number of studies on Chinese consumers'
53 perception and behaviour for dairy products have been carried out. Chinese consumers' perception
54 of certified dairy products has received increasing attention by scholars due to increasing concern
55 about food safety among consumers (Quan, Zeng, & Liu, 2011; Wang, Mao, & Gale, 2008; Xu,
56 Zhou, & Lone, 2016). Indeed, Chinese consumers are concerned about the safety and quality of the
57 dairy products they consume (Qiao et al., 2010). Some previous studies have emphasised the
58 demographic characteristics that could affect their risk perception of dairy products. Specifically,
59 consumers' family income significantly affects milk safety concerns (Xu, Zheng, & Motamed,
60 2010). Wu, Yin, Xu, & Zhu (2014) reported that most Chinese consumers had a lack of knowledge
61 of organic food but had a higher WTP for EU and US infant milk formula with organic certification
62 labels. They also found that, in addition to the price factor, the organic certification label, brand,
63 and country of origin are the most important attributes for consumers while purchasing infant milk
64 formula. In another study, young females with a strong educational background have expressed a
65 high safety concern and have the strongest consumption desire for organic milk, while those who
66 shop for the family tend to support organic milk and willing to pay more for the organic milk (Xu et
67 al., 2016).

68 Some studies specifically aimed to examine consumers' attitudes towards traceable dairy
69 products. Consumers are generally willing to pay higher prices for infant formula with traceable
70 labels, and generally do not approve sales in pharmacies (Zhu & Xu, 2017). Traceability
71 information was more important than brand or country of origin for Chinese consumers while
72 purchasing infant milk formula (Yin, Li, Xu, Chen, & Wang, 2017). A study by Yin et al. (2014)
73 based on the analysis of policy background, analysed consumers' willingness to pay to examine the
74 effects of public management policy through choice experiments. The research showed that
75 consumers had a higher WTP for infant milk formula with traceable information labels, famous

76 brands, and overseas production place. Bai et al. (2013) indicated that consumers significantly
77 prefer traceable milk products to those carrying no traceability information.

78 Despite the importance and perceived value of traceability information for dairy products has
79 been established, at the best of our knowledge, no research using a qualitative approach has dealt
80 with the attitudes of consumers towards traceable dairy products. The absence of qualitative studies
81 may lead to a lack of in-depth understanding of the issue at hand, since quantitative studies may
82 have been designed considering only the researchers' view of the problem, thus missing important
83 aspects. This study is aimed at addressing this gap, providing a more comprehensive insight into
84 Chinese consumers attitudes towards traceable products, even though with the typical limitations of
85 a qualitative approach.

86 The research questions to be addressed here are:

- 87 • What is the Chinese consumers' perceptions of food safety in the dairy sector?
- 88 • What attitudes do Chinese consumers' have towards traceable dairy products?
- 89 • What are Chinese consumers' attitudes towards traceability certification authorities?

90 This research aims to explore Chinese consumers' perception of dairy food safety, purchasing
91 behaviour related to dairy products, as well as, analyse consumer attitudes towards traceability
92 systems and traceable dairy products through a qualitative approach. This paper addresses the
93 following objectives:

- 94 • to explore consumers' perceptions of food safety of dairy products;
- 95 • to investigate consumer attitudes and perceptions towards traceability in the dairy industry.

96 As an exploration, the purpose is to highlight notable issues and to provide insights that,
97 although they cannot be generalised and must be considered with care, can serve as a useful input
98 for further research. We aim to provide a useful contribution and a possible starting point to inform
99 more in-depth qualitative and quantitative analyses on this crucial topic.

100 MATERIALS AND METHODS

101 Many methods are available for consumers attitudes and perceptions, such as individual
102 interviews, focus groups, nominal group technique, concept mapping, Delphi method, etc. (Powell
103 & Single, 1996; Hasimu, Marchesini, & Canavari, 2017; Su & Canavari, 2019). Each qualitative
104 technique may have advantages and disadvantages that make them more or less suitable to achieve
105 the research goals (Morgan & Krueger, 1993; Morgan, 1996).

106 Among the qualitative techniques available, we identified focus group interviews as the most
107 appropriate method for this study, thanks to its ability to stimulate the participants' reactions to new
108 information while they are expressing their thoughts (Crovato, Mascarello, Marcolin, Pinto, &
109 Ravarotto, 2019). In-depth interviews allow the researcher to have a very intense exchange of
110 information with the subject and are suitable when dealing with sensitive or confidential
111 information. Focus groups, on the other hand, are more efficient and enable researchers to identify
112 quickly the full range of perspectives held by the participants in the group discussion. In focus
113 groups, participants can clarify or expand upon their opinion, in the light of points raised by other
114 participants, thus considering more in-depth elements that might be ignored or left underdeveloped
115 in in-depth interviews (Powell and Single, 1996). Thus, a distinctive feature of focus groups is the
116 generation of data through social interaction: the researcher can take advantage of group dynamics
117 interactions between participants, which allows for a better observation of consensus and
118 disagreements between individuals (Belk, Fischer, & Kozinets, 2013). Consumer focus groups are
119 suitable to efficiently explore a number of experiences and ideas of the participants, allowing them
120 to interact, stimulate each other, compare their views, and helping the researcher to gather insight
121 about the group feelings (Morgan & Krueger, 1993; Morgan, 1996; Threlfall, 1999).

122 The same method has been used in the study of consumers perception in food markets in
123 China or other countries (Asioli, Canavari, et al., 2014; Bruschi, Shershneva, Dolgopolova,
124 Canavari, & Teuber, 2015; Cui, Liu, Woock, Zhang, & Cacciolatti, 2016; Hinkes & Christoph-

125 Schulz, 2019; Kendall et al., 2018; Lindberg, Salomonson, Sundström, & Wendin, 2018; Roos,
126 Hansen, & Skuland, 2016; Williams, Stewart-Knox, & Rowland, 2004).

127 *Focus group procedure*

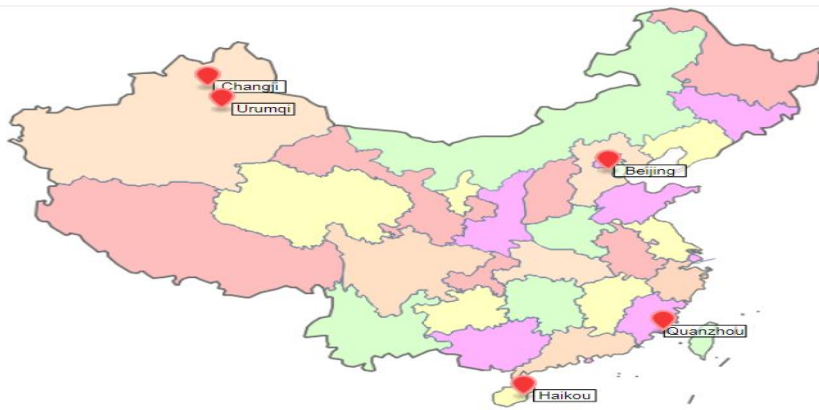
128 Interview guidelines were defined based on the literature review and organised in three
129 sections. In the first section, participants were asked to give their opinion relating to food safety
130 concerns. In the second section, consumers were asked about purchasing behaviour and food safety
131 perception of dairy products. The last section led the group into discussions about consumer
132 attitudes toward traceable dairy products and the actors in the food traceability system.

133 Each focus group interview lasted approximately 90 minutes; before starting the interview,
134 participants were provided with the interview guideline. The participants were told to discuss three
135 categories of dairy products: (1) Milk, (2) Yogurt, (3) Infant formula milk powder.

136 The data for the study were collected during nine focus group interviews, a number that is
137 higher of most similar studies based on this method (Nyumba, Wilson, Derrick, & Mukherjee,
138 2018); this number results from both time and budget constraints and from the consideration of
139 saturation in the emergence of new information from the new focus groups (Guest, Namey, &
140 McKenna, 2017).

141 Geographically, data were collected in four cities (Figure 1): Urumqi and Changji in the
142 Northwest of China (North Group), and in Haikou and Quanzhou in the South of China (South
143 Group). Urumqi and Changji belong to the Xinjiang Uygur Autonomous Region (Xinjiang).
144 Urumqi is the capital city of Xinjiang, which is one of the important high-quality milk sources and
145 significant production areas of dairy products in China. Haikou is the capital, and most populous
146 city of the Hainan province and Quanzhou is the largest metropolitan region in the Fujian province,
147 its GDP ranked first in the Fujian Province for 20 years, from 1991 to 2010. To a certain extent,
148 Haikou and Quanzhou are representative of the coastal regions of South China.

149



150

151 **Figure 1. Focus group locations.**

152 The Focus groups were conducted from January to April 2018. Altogether, 61 consumers (24
153 male, 37 female) of dairy products participated in the focus group interviews. Three focus group
154 sessions were held in Changji, while two sessions were held in each of the other locations.

155 Most scholars using focus group interviewing recommend a group size of six to twelve people.
156 If there are more than 12, the session takes too long, and group interaction becomes more difficult
157 to achieve, if there are fewer than six, there may be insufficient interaction (Lichtman, 2014).
158 Consistently with best practice, in our study each focus group contained 6-9 participants recruited
159 based on selection criteria aimed at achieving a balance for demographic characteristics and
160 purchasing habits, specifically: 1) gender (40% males and 60% females), 2) age (18–60 years), 3)
161 education background, 4) socioeconomic status (middle/upper class) 5) purchase of dairy products
162 in the last three months. **Participants in peer groups were invited to the same group for discussion to
163 reduce heterogeneity among participants in our focus groups.** The final composition of the groups is
164 summarised in Table 1. **Except for G4, participants in other groups were mostly in the same peer
165 groups.**

166

167

168

Table 1. Focus group participants' characteristics

Focus group location	Focus group number	Participant No	Participant code	Age	Gender	Family members	Personal monthly income (RMB)	Education background
Urumqi	1	n=8	G1 M	21-25	4 M	2-5	1000-4000	BD
			G1 F		4 F			
Urumqi	2	n=6	G2 M	21-24	3 M	3-4	1200-2000	BD
			G2 F		3 F			
Changji	3	n=9	G3 M	21-36	4 M	1-5	1000-8000	BD
			G3 F		5 F			
	4	n=6	G4 F	23-55	6 F	4-6	2500-4000	JMS, HS, BD
Changji	5	n=6	G5 M	18-23	4 M	3-5	1000-2300	TD, BD
			G5 F		2 F			
Quanzhou	6	n=6	G6 M	22-26	3 M	3-8	1500-4000	BD
			G6 F		3 F			
Quanzhou	7	n=6	G7 M	40-60	2 M	3-5	1500-4000	PS, JMS, HS
			G7 F		4 F			
Haikou	8	n=6	G8 F	26-41	6 F	2-4	3000-8000	TD, BD
			9	n=8	G9 M	29-40	4 M	2-4
G9 F	4 F							
Total	n=9	n=61		18-60	24 M 37 F	1-8	1000-8000	-

169 Foreign exchange quotation is 100 Euro =804.72 Yuan, 16th October 2018

170 M: male; F: female; PS: Primary school; JMS: Junior middle school; HS: High school; TD: Technical or vocational
171 degree; BD: Bachelor's degree;

172

173 **Data analysis**

174 The participants' agreement to take part in the focus groups was based on fully informed
175 consent; all participants are anonymised. All of the focus group discussions were recorded and
176 transcribed verbatim by two research assistants managing the interviews and checked by the first
177 author and a master's degree candidate to ensure consistency. Data input and analysis were carried
178 out using the software Nvivo version 11.4.0 for Windows, which has features such as character-
179 based coding, rich text capabilities, and multimedia functions that are crucial for qualitative data
180 management (Zamawe, 2015). The first author read and re-read the verbatim text and then carried
181 out the open coding. The interview guide covered the following topics: 1) Purchasing behaviour of
182 dairy products, 2) Perception of food safety in the dairy sector, 3) Attitude toward traceability dairy

183 products, 4) Viewpoint towards the actors in Food Traceability System. The full discussion
 184 guidelines are available from the authors on request.

185 **Table 2. Interview guideline**

Topic of interest	Guiding questions
Purchasing behaviour of dairy products	1. Where do you usually purchase dairy products? 2. Do you read food labels? Do you pay attention to them?
Perception of food safety	1. What do you think about food safety? 2. What kind of aspects of food safety do concern you about dairy products? 3. How do you decide whether a source is reliable? 4. Have you ever personally experienced an issue with safety in dairy products?
Attitudes toward traceability for (dairy) products	1. How important is to you to be able to track and trace back all stages of dairy production, processing, and distribution? 2. How would you explain the meaning of traceability in food? 3. Do you think traceability certification is useful? 4. Would you buy traceable dairy products? Why? Or why not? How much more would you pay for Traceability?
Viewpoint towards the actors in Food Traceability System	1. Which actor do you trust the most to manage traceability system food supply? Why? 2. Who should be responsible for ensuring that foods are traceable?

186

187 **RESULTS**

188 *Purchasing behaviour*

189 Participants are opting for the supermarket as the primary place for purchasing dairy products
 190 because they are perceived as more convenient to shop in, and they also offer many opportunities in
 191 terms of selecting and buying a safety product. This preference was stronger among the participants
 192 in groups from the South.

193 A large number of participants took the large retailers such as Carrefour or other supermarket
 194 chains as the most frequent purchasing venue for dairy products. Also, there are some participants
 195 in North groups who purchase loose milk in small retail shops such as convenience store
 196 (convenience shop, or corner store) or by street vendors. The consumers think that the loose milk
 197 sold there is safer and cheaper because they trust that these products are very fresh and without food
 198 additives.

199 Concerning label information, with a few exceptions, most of the respondents stated that they
 200 have a habit of reading the label information while buying dairy products. Nevertheless, the results
 201 from the discussion show that the respondents from different groups have different attention to the

202 labels information during purchases milk and yoghurt products. Most of the respondents in the
203 North group indicated that they pay the most attention to the production and expiry date. In contrast,
204 the brand and production dates are critical information for respondents in the South group while
205 buying milk and yoghurt.

206 *Food safety concern*

207 When asked about the safety of dairy products, the majority of participants reported that they
208 were “worried” or “very worried” about the safety of dairy products. Food safety incidents were
209 mentioned frequently, resulting in many consumers turning to imported safety and quality in dairy
210 products.

211 The results from that discussion showed that consumers who live in different areas have a
212 different perception of food safety in the dairy industry. As expected, participants in the North
213 group have stressed the fact that they are also concerned about food safety issues, but on the other
214 hand, they expressed more optimistic views about food safety than participants in the South group.
215 The main reason for that could be the region in which they live - Xinjiang is one of the five
216 traditional pasturing areas and one of the most important milk source bases of China. Participants in
217 the North group consistently expressed higher confidence about food safety of dairy products,
218 mainly because they feel assured by the local origin of the product and the reputation of the area as
219 it is specialised in livestock farming.

220 Especially those participants who have older people or children (under 16 years old) in their
221 family expressed more concern about food safety and quality in the dairy sector, due to the situation
222 that they pay close attention to food safety when they prepare food for their children or parents.

223 The answers collected from the discussion about dairy products safety are graphically
224 depicted in Figure 2 using word clouds. It is a visual representation of text data, widespread for
225 reporting qualitative data (Cappelli et al., 2017). The most frequent words appeared to represent the
226 aspect of participants' concern in the dairy sector, as it has demonstrated from the word cloud. From

227 the data in Figure 2, it is apparent that the respondents had a great concern in chemical residues,
228 followed by food additives and microbial pathogens as the top three concerns. More than half of the
229 participants mentioned chemical residues during the discussion, while some other participants replied
230 that they also worried about expired food and heavy metal pollution with dairy products.



231
232 *Figure 2. Word Cloud of the aspects of concern in the dairy sector mentioned by the FG participants.*

233 *Influence of social media on consumers perception*

234 Media coverage plays an essential role in people's food-risk perceptions following a major
235 food scare, as media perspectives on the safety of the food supply might have an impact on those of
236 the general public (Zingg, Cousin, Connor, & Siegrist, 2013). The news reports about food safety
237 incidents have an impact on consumers' perception of food safety in the dairy sector. Participants
238 gave many examples of cases of food safety incidents, which had been reported in the media such
239 as Sudan red, Melamine milk scandal, and others. Though the melamine milk scandal happened ten
240 years ago, consumers have restored their confidence in the safety of dairy products, but some of
241 them have not forgotten it, because this chemical contamination scandal left many families worried
242 about dairy products.

243 Personal or relatives' experience in food safety is another major factor affecting consumers
244 'perception. A total of 15 participants out of 61 replied that they or their relatives had direct
245 experience of food safety issues.

246 *Tracking-and-tracing and traceable dairy products*

247 Most of the participating consumers expressed that tracking and tracing back all stages of
248 dairy production, processing, and distribution is of utmost importance. They believe that traceability
249 at all of the stages (from farm to table) can provide information that they want to know and will
250 help them make the right choice while purchasing. Meanwhile, some of them are worried about the
251 reliability of tracking and tracing product information. They are especially worried about the fact
252 that the enterprises might falsify traceability information for their commercial interests.

253 In contrast, only few participants perceived traceability as unimportant. In this regard, some
254 participants stated that traceability information would help authorities figure out where the problem
255 comes from. It has been perceived almost as a relief measure, and it may not help much by
256 improving the situation of food safety.

257 The results of the section on consumers' awareness indicated that most respondents do not
258 know much about traceable food. However, some of them just had heard about it before, and a
259 small number of respondents expressed that they had purchasing experience.

260 Interestingly, although some of them have not heard about traceable food before, nonetheless
261 they could explain the concept of traceable food. The reason may be imputable to semantic reason:
262 in the Chinese language, the word "ke zhui su" explicitly describes the concept of "traceable", it
263 literally means "the ability to trace back", so consumers can easily guess the mean.

264 However, having awareness about the traceability of products means that the "traceable" -
265 aspect does not necessarily equate with a full understanding of traceable food. When asked about
266 the difference between traceable food and untraceable food, they stated that with traceable food, one
267 could trace back the production information, i.e., the place and date of production or producer

268 information. They thought the traceability just include product information. However, according to
269 the definition given by The Codex Alimentarius Commission Procedural Manual (FAO/WHO,
270 1997) traceability is "the ability to follow the movement of a food through specified stage(s) of
271 production, processing and distribution"(Olsen & Borit, 2013). As it can be seen as obvious, most
272 of the participants were not fully aware of the food traceability system features.

273 *Traceability labelling and consumer confidence*

274 Although half of the participants did not know about traceable food, after the investigators
275 gave a brief video introduction, five out of the six participants believe that the food traceability
276 system will be valuable to them. For them, it could enhance their confidence in food safety while
277 purchasing dairy products. Participants explain that:

278 However, some other participants reported that it is not useful for them, or they do not know
279 whether it is useful to them. Their main reason for that is the food traceability system is an ex-post
280 measure, which can only provide the tracked information and just allows for timely recall the
281 suspected products along the food supply chain in the event of food safety problems. It could help
282 only the Government or enterprises determine who should be responsible for such problems.
283 Furthermore, they were also worried about the reliability of the tracked information.

284 Most participants mentioned that they had not bought traceable dairy products before. Some
285 of the participants stated that after the investigators gave a brief video introduction, they knew that
286 they had consumed traceable milk without knowing that this is called "traceable milk.

287 We also asked about the extra charges for traceable dairy products and the reasons of
288 participants do or do not buy the traceable dairy products. The results showed that most respondents
289 are willing to bear under ten per cent extra costs for traceable dairy products. It was evident that the
290 premium consumers were willing to pay were not high. In the supermarket, the price of traceable
291 foods is much higher than those of normal foods (Wu, Xu, Zhu, & Wang, 2012). The result also
292 showed that health benefits are an essential motive for the purchase of traceable dairy products. The

293 main reasons for not been willing to buy were given as follows: "incomprehension, distrust,
294 inconvenience to purchase and price."

295 *The role of Supply chain operators: trustworthiness of traceability information*

296 In our interviews, participants indicated that they suspected the authenticity of traceability
297 information. They were more likely to trust the traceability information certified by the Government,
298 followed by third-party certified or international certificated. Most of them do not trust the
299 traceability information provided by the producing company that has not been certified by any other
300 third-party certification bodies. They worried that the enterprises might falsify traceability
301 information for their commercial interests.

302 However, some interviewees stated that the traceability information certified by the domestic
303 third-party or international agencies is valued more highly than certificates issued by the
304 Government or enterprises. Participants explained this by saying:

305 Another issue worth discussing is the fact that participants who trusted government certificate
306 or third-party agencies certificate have in common the lack of faith in enterprise certificate. They
307 worried that the enterprises might falsify traceability information for their commercial interests. For
308 example, a man 40- years old, said:

309 *Who should cover the cost?*

310 Implementation of traceability systems could lead consumers to perceive a higher value and to
311 be willing to pay a premium price for dairy products. However, traceable food with relatively
312 complete production attributes is bound to have a higher production cost, which will be eventually
313 reflected by the product price, and consumers will have to make trade-offs between complete
314 traceability and higher prices for traceable food (Wu et al., 2017). To understand consumers'
315 perceptions about the cost of the food traceability system, the participants had discussed who should
316 be responsible for the cost of the Food Traceability System. Most of the participants stated that the

317 Government should be responsible for all or most of the cost of establishing the food traceability
318 system. A participant explains that.

319 However, some other participants reported that enterprises should bear all the cost for
320 establishing the food traceability system except for a few participants stated that consumers should
321 pay for it.

322 **DISCUSSION**

323 *Purchasing behaviour*

324 The results showed that most participants regard supermarkets as the primary place to buy
325 dairy products. One of the reasons for that is that the customers perceive convenience, proximity,
326 variety, and food safety as very important to them. Similar to the results offered by Cheng et al.
327 (2016), supermarkets were the most trusted purchasing places perceived by customers. Although
328 many participants took the large retailers such as Carrefour or other supermarket chains as the most
329 purchasing venue of buying dairy products, but also there are some participants in North groups
330 who showed that they would purchase the loose milk in the small retailer shops such as the
331 convenience store or street vendors. They think that the loose milk sold there is safer and cheaper
332 because they are convinced that dairy products are very fresh and without food additives. Our study
333 confirms the previous finding that the main factors affecting Chinese consumers to select street
334 vendors to purchase foods are convenience, freshness, and price. Street vendors have large numbers
335 of customers because it is highly convenient, and generally, they tend to offer lower prices (Feng,
336 Feng, Tian, & Mu, 2012).

337 Considering the use of the label information, our findings show that most participants have
338 the habit of reading the label information while buying dairy products. Consumers noted reading
339 food labels could help them to obtain more information and make a good choice to purchase. This
340 finding is in line with a previous study conducted by Qing, Yan, & Wang (2006) and which has
341 revealed that a vast majority of consumers in Wuhan city claimed to read the information on food

342 labels or production descriptions before making a purchase decision. However, this finding
343 significantly differs from previous results reported in the literature (Zhu, Cai, & Wang, 2013; chan,
344 Tse, Tam, & Huang, 2016; Wang et al., 2013). Our interviewees expressed the opinion that brand
345 and quality certification got the most attention by them while purchasing **infant formula** milk
346 powder. The respondents from different groups have different attention to the label's information
347 during purchases milk and yoghurt products. Most of the respondents in the North group have
348 indicated that they pay the most attention to the production and expiry date, while the brand and
349 production date is the key information for respondents in the South group while buying milk and
350 yoghurt.

351 *Consumer's food safety concern*

352 Food safety consistently ranks among the top concerns of participants in the discussion. The
353 outcome of this discussion is not surprising. To enhance consumer confidence in food safety, the
354 Government has undertaken various policy measures to improve the safety and quality of food.
355 However, Chinese consumers are gravely concerned about the quality and safety of their food like
356 consumers in other countries, and indeed the Chinese consumers have more reason to be concerned
357 about food safety, especially for dairy products. Our study confirms previous findings that
358 consumers have higher levels of concern regarding food safety, including dairy products (Chen et
359 al., 2013; Qiao, Guo, & Klein, 2010; Veeck, Veeck, & Zhao, 2015; Zhang, Bai, Lohmar, & Huang,
360 2010). Notably, the participants with children or older people were more leaning to show concern
361 about food safety in the dairy sector. Our findings are in line with the previous study that found that
362 the respondents who had children are more concerned about milk safety (Gao, Li, Bai, & Fu, 2020).

363 Furthermore, consumers who live in different areas have a different perception of food safety
364 in the dairy industry. Participants in the North group have stressed the fact that they are also
365 concerned about food safety issues, but on the other hand, they expressed more optimistic views
366 about food safety compared to participants in the South group. The results of the previous study

367 provide a possible explanation for this finding that participants perceive local foods as being of a
368 higher quality than imported foods (Chambers, Lobb, Butler, Harvey, & Traill, 2007). In our study,
369 participants in the North group linked the local dairy products to high quality and safety, because
370 the region in which they live is one of the most important dairy production areas. Furthermore,
371 differently from most of the other Chinese regions, Xinjiang has a long history of dairy cattle
372 farming and milk consumption. (Beldman et al., 2014).

373 Our results show that regarding the consumption of dairy products, chemical residues are the
374 biggest concern for most consumers. Despite food safety incidents caused by chemical
375 contamination are less frequent than those caused by microbial agents, toxic animal, or plant foods
376 (Lam, Remais, Fung, Xu, & Sun, 2013), it seems that consumers are more sensitive to chemical
377 residues in the dairy sector. Part of the reason for this might be related to the infamous "Sanlu"
378 infant formula milk powder incident, which is the most sensational one: melamine, an industrial
379 chemical, had been added to milk somewhere along with the supply chain, and twenty-two dairy
380 companies were eventually implicated in the scandal. Although it has been more than a decade
381 since 2008, consumers still remind the incident.

382 *The influence of social media on consumers perception*

383 Due to frequently occurring food safety issues, consumers have increased attention to the
384 reports related to food safety incidents in the media, which include social media such as blogs,
385 microblogs, and direct messaging apps like WeChat. This situation is consistent with the one
386 described in a previous study, which concluded that food-safety scandals revealed by the media
387 could easily be noticed and reminded by consumers and further affect their judgments of expected
388 utility and their purchasing behaviour (Peng et al., 2015; Peng, Li, Xia, Qi, & Li, 2015). However,
389 it should be noted that false news has the same effect on consumers. There are constant reports
390 about food safety, and some media hosted false reports published with the sole purpose of
391 increasing web traffic, especially on social media platforms such as Weibo, WeChat. Moreover,

392 Chinese consumers find it very difficult to confirm the truthfulness of those reports because the
393 response from the Government or other official media is slow, and most consumers choose to trust
394 the adverse reports about food safety because they did not know how to identify the truth (Zhu,
395 Jackson, & Wang, 2017). Another factor highlighted in the focus group discussion is that direct or
396 indirect personal experience with food safety issues would affect consumers' confidence in food
397 safety, as also confirmed by the previous literature (Hansstein, 2015).

398 *Awareness about traceable food*

399 In the opinion of most participants, the possibility to trace back products at all stages of the
400 dairy supply chain is considered essential. In line with the previous literature (Wang et al., 2013),
401 consumers believe that tracking and tracing through all of the stages (from farm to table) can
402 provide the information they want to know and will help them make the right choice while
403 purchasing. However, in our study, we find out that traceable food is not very well-known among
404 the participants in these focus groups. Some of them just had heard about it before, and many
405 participants mentioned that they had never bought traceable dairy products before. About the option
406 to buy or not to buy, the main reasons given were as follows: "incomprehension, distrust,
407 inconvenience to purchase and price." Similar to the study of Wu et al. (2015), basically consumers
408 do not know about or trust traceability information.

409 *Credibility and authenticity*

410 Despite the lack of awareness, providing consumers with food safety and quality information
411 by the traceability system is considered important within the discussion. Respondents suspected that
412 the authenticity of traceability information, particularly about the traceable information, which was
413 provided by enterprises by themselves but has not been certified by other third-party bodies, can be
414 of crucial importance to them. They are worried that the enterprises might falsify traceability
415 information for their commercial interests. The traceability information certified by the Government
416 has more value for consumers than certified by third-party. These results of the present study

417 corroborate previous findings that consumers were dubious about the authenticity of traceability
418 information, and a government certificate for traceability is currently valued more highly than
419 certificates issued by a third-party (Hansstein, 2015; Ortega, Wang, Wu, & Olynk, 2011).

420 Moreover, Bai et al. (2013) have found a slightly different result in their study that although
421 government-issued certification is still currently valued at the highest position. However, third-party
422 certification for traceability food will become increasingly important in the future, and the rising
423 income and education are two driving forces. This finding has certain similarities with the
424 conclusion of Wu et al. (2015) that consumers of different ages, education, and income level have
425 different levels of trust in certification agencies. Young consumers with high education and income
426 levels had a high relative willingness to pay for domestic third-party certification while purchasing
427 traceable food.

428 *Cost of the food traceability system*

429 Regarding the issue of the cost for the establishment of a food traceability system, on one side,
430 consumers stated that the Government should be responsible for all or most of the cost. Others
431 argued that enterprises should bear all the costs of establishing the food traceability system.
432 Moreover, the stated price-premium of consumers on the purchase of traceable dairy products is, in
433 most cases, quite low, people often indicate less than ten per cent. That means Government or
434 enterprises should play an essential role in the implementation of the food traceability system. The
435 result corroborates the previous finding of Wu et al. (2012), who found that if the price of certified
436 traceable food is not acceptable or affordable to consumers, the implementation and promotion of
437 food traceability system will be difficult. Therefore, government funding support is critical for the
438 implementation of food traceability systems.

439 CONCLUSION

440 The present study explored perceptions about the safety of dairy products and factors
441 affecting consumers' decision while purchasing dairy products, as well as consumers' attitudes
442 toward traceable dairy products. Nine focus group interviews with sixty-one participants have been
443 carried out in four cities in three different provinces of China.

444 Focus groups indicated that a high prevalence of food safety incidents triggers consumers to
445 lower their confidence in food safety and to pay more attention to the news about food safety
446 incidents in the media, including social media. Chemical residues were ranked as the first concern
447 on food safety in the dairy industry. Meanwhile, traceable dairy products are not well known among
448 consumers. Although the possibility to trace back all stages of the food supply chain in the dairy
449 sector is considered necessary, consumers raise doubts about the authenticity of traceability
450 information. In particular, they are not confident about traceability information provided by
451 enterprises that have not been certified by other third-party bodies. For the interviewees, the
452 traceability information certified by the Government has more value than the information certified
453 by third-party agencies. Meanwhile, consumers suggest that the Government should bear all or most
454 of the cost of establishing the food traceability system.

455 The study has some limitations that must be acknowledged. The research approach is
456 qualitative and based on a small group of Chinese dairy consumers. The focus group interviews
457 covered two different regions (Northwest and South of China), but cannot fully represent a wide
458 and complex country like China. The number of focus groups was limited to nine because of budget
459 constraints and because the researchers considered a sufficient level of saturation in the emergence
460 of new information was reached. However, it is certainly possible that more insights could have
461 been added if more discussions in other locations were organized. In any case, qualitative research
462 is not based on representative samples and usually its results cannot be generalised on the statistical
463 point of view.

464 However, the results can serve as a useful input for further research, and they provide a rich
465 insight into consumer views of dairy products' safety problems in China. Some questions remain
466 open, such as what are the internal and external factors affecting consumers buying behaviour and
467 what is the consumers' willingness to pay for traceable dairy products. A follow-up study based on a
468 quantitative survey would be useful to attach a measure of relevance to the issues and aspects raised
469 in this research.

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