

# Article Title Page

## British Food Journal

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#### [Article title]

General image, perceptions and consumer segments of luxury seafood in China: a case study for lobster

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1           **General image, perceptions and consumer segments of luxury**  
2           **seafood in China: a case study for lobster**

3  
4   **Structured Abstract:**

5   **Purpose** - This study explores Chinese consumers' perceptions towards a luxury  
6 seafood- lobster and identifies the important perceptions that influence Chinese  
7 consumers' general image of lobster. It also recognizes Chinese consumer segments  
8 based on their perceptions towards lobster.

9  
10 **Design/methodology/approach-** The data was collected through an online survey  
11 (n=882, in two Chinese cities: Shanghai and Qingdao). The surveys explored  
12 consumer perceptions and general image of lobster. Descriptive analysis, partial least  
13 squares regression and cluster analysis were conducted for data analyses.

14  
15 **Findings** - Findings show that the most important perceptions regarding lobster by  
16 Chinese consumers are *umami, delicious, high in protein, expensive, nutritious,*  
17 *upscale, red colour, and bring back appetite.* Chinese consumers' general image of  
18 lobster is positively linked to perception-items, such as, *Delicious, Western flavor,*  
19 *Umami, Nutritious, High in protein, Enjoy, Upscale and Appetite;* and is negatively  
20 linked to perception-items *Spicy/hot, Chinese flavor and Risk in illness.* Three  
21 consumer segments are identified: Western-flavour-lovers (35.4%), Chinese-flavour-  
22 lovers (32.8%) and Negative-believers (31.8%). Significant differences were  
23 recognized in the socio-demographic distribution among these three segments  
24 including, city, income, marital status, educational level, occupation and age.

25  
26 **Originality/value** – This is the first study to present information regarding  
27 consumers' perceptions, general image, and segments towards luxury seafood in the  
28 world's largest East-Asian country- China. The findings from this study can help  
29 global seafood marketers and exporters to better understand Chinese consumers which  
30 should assist them in developing effective marketing strategies for their luxury  
31 seafood products in this major market.

32  
33 **Keywords** – Chinese consumer; luxury seafood; lobster; image; perception;  
34 segmentation

35  
36 **Article Classification-** Research paper

## 51 **Introduction**

52 Seafood plays an increasingly important role as a main resource of people's protein  
53 intake in the world and recently, global per capita seafood consumption and seafood  
54 export value have both reached their highest levels in history (MarEx, 2016; Nguyen  
55 et al., 2015). China is the largest and quickest growing seafood market in the world  
56 (Fabinyi et al., 2016) and due to its rising middle-class of consumers with higher  
57 purchase power and a dietary tradition of luxury seafood consumption, this large  
58 country (with 20% of the world's population) is experiencing a dramatic growth in the  
59 demand for luxury seafood (e.g. lobster and king crab) (Lindkvist et al., 2008; Fabinyi  
60 et al., 2012; Wang et al., 2015a; Whittle, 2015; Xiao, 2015). As a result, China has  
61 become an important market for global exporters of luxury seafood (Fabinyi et al.,  
62 2012; Taylor, 2015). As such, there is a need for global exporters to better understand  
63 Chinese consumer behaviour towards luxury seafood.

64 A number of attempts have been made to capture knowledge about seafood  
65 consumer behaviour. However, seafood-based consumer studies have mostly been  
66 conducted within Western countries, therefore it is particularly important to  
67 understand Chinese consumer behaviour towards seafood due to the differences in  
68 dietary cultures and habits between China and Western countries (Wang et al., 2015a;  
69 Wang et al., 2016), and the psychological difference in seafood consumption between  
70 China and Western countries (e.g. Chinese consumers pay more attention to their  
71 cultural beliefs and displaying their social status for seafood consumption in  
72 comparison with Western consumers) (Fabinyi and Liu, 2014a, b; Fabinyi et al., 2016;  
73 Hu et al., 2014).

74 Furthermore, most previous studies have focused on fish and seafood as  
75 general food types (e.g. Brécard et al., 2012; Pieniak et al., 2008) or involved specific  
76 seafood mixed with high-value and low-value species as research objects (e.g. lobster  
77 versus shrimp; salmon versus squid) (e.g. Cardoso et al., 2013; Fabinyi et al., 2016;  
78 Salladarré et al., 2016). Although some studies indicate the significant importance of  
79 luxury seafood in Asian (especially Chinese) dietary cultures (e.g. food for festivals  
80 and banquets) (Fabinyi, 2012; Fabinyi et al., 2012; Fabinyi and Liu, 2014a, b; Purcell  
81 et al., 2014), there is still a lack of empirical studies specifically related to consumers'  
82 perceptions, attitudes and behaviour towards luxury seafood. In particular, and to our  
83 knowledge, no study has been done (based on qualitative elicitation and quantitative  
84 confirmation) to identify consumers' perceptions and their impact on consumption  
85 behaviours for luxury seafood in China- the largest and continually rising luxury  
86 seafood market in the world.

87 Chinese consumers have a dietary tradition of luxury seafood consumption in  
88 order to enhance their 'face consciousness', with traditionally favourite species such  
89 as shark fin, sea cucumber, abalone and live reef fish (Bao et al., 2003; Fabinyi, 2012;  
90 Fabinyi et al., 2012; Fabinyi and Liu, 2014a, b; Purcell et al., 2014). They prefer to  
91 eat seafood (especially luxury seafood) out of home and consume more than 60% of  
92 seafood at food service sectors (e.g. hotels and restaurants) (Fabinyi, 2012; Fabinyi et  
93 al., 2012; Fabinyi and Liu, 2014a, b; Fabinyi et al., 2016). They are more willing to  
94 consume live seafood than frozen and processed products as 'freshness' is considered  
95 a significant factor to ensure their favourite 'umami' taste for seafood dishes (Fabinyi  
96 & Liu, 2014 a, b; Komata, 1990; Kurihara, 2009; Nakayama & Kimura, 1998; Zhao,  
97 2003). This results in a higher price for live seafood than frozen and processed  
98 seafood in the Chinese market. For example, live Boston lobster is much expensive  
99 than fresh-frozen Boston lobster in Chinese market (\$34 USD/kg versus \$19.9

100 USD/kg, prices taken from China's largest online retail platform 'Tmall.com' on 20  
101 October 2017).

102 With the growth of personal purchase power and a more open policy for  
103 seafood importation in China, some imported luxury seafood species have become  
104 popular and have been experiencing a steep increase in consumption in past years  
105 (Lindkvist et al., 2008; Fabinyi et al., 2012; Fabinyi, 2016; Farhadi et al., 2013;  
106 Whittle, 2015; Xiao, 2015; Xiong et al., 2016). This is particularly the case in recent  
107 times, shown in a growth of 5142% for the imported value of U.S. lobster from 2009  
108 to 2016, the growth of 2178% in the imported value of Canadian lobster from 2010 to  
109 2015 and the growth of 406% in the imported volume of Canadian salmon from 2011  
110 to 2016, and the growth of 1922% of import volume of Chilean salmon from 2013 to  
111 2016 (e.g. fresh-frozen salmon has a price of 24 USD/kg on 'Tmall.com' on 20  
112 October 2017) (Burman, 2017; Seafood Guide, 2017; Whittle, 2015; Xiao 2015).

113 Against this background this study will explore Chinese consumers'  
114 perceptions towards luxury seafood. Product perceptions are the main cues for  
115 consumers to estimate the quality of the food product (Dekhili et al., 2011; Oude  
116 Ophuis and Van Trijp, 1995). Understanding the relative importance of product  
117 perceptions for food choice is vital for the success of product development (Enneking  
118 et al., 2007). Furthermore, it will also examine the influences of Chinese consumers'  
119 perceptions on their general image for luxury seafood. Product image relates to  
120 consumers' total beliefs about a product; a positive image results in positive consumer  
121 expectations that will lead to purchase (Almli et al., 2011; Wang et al., 2012). Lobster  
122 is selected as the research object in this study due to the dramatic import growth and  
123 the high price per unit in China (with an import value of USD 529 million in 2016)  
124 (Burman, 2017).

125 The objectives of this study are: 1) to recognize Chinese consumers'  
126 perceptions towards lobster; 2) to identify the important product perceptions which  
127 drive Chinese consumers to have a positive or negative image of lobster; 3) to identify  
128 consumer segments based on their perceptions for lobster in China.

129

## 130 **Methods and materials**

### 131 *Participants and procedures*

132 Quantitative data was collected through an online survey in two Chinese cities:  
133 Shanghai and Qingdao in December 2016. These two cities were selected in order to  
134 identify similarities and differences in consumer beliefs and image about lobster  
135 between first-tier and second-tier cities, and between Northern and Southern cities in  
136 China (Liu et al., 2011; Wang et al., 2017).

137 A web-based questionnaire was sent to participants in Shanghai and Qingdao  
138 for the quantitative study. They were members of a sample panel of a Chinese  
139 research agency, with strict identification practices based on socio-demographic  
140 characteristics, such as national ID card and IP address. Only those participants who  
141 had consumed lobster before and carefully completed the survey were kept by the  
142 online system. A total of 882 valid responses were obtained for this quantitative  
143 survey, 427 from Shanghai and 455 from Qingdao. Table 1 shows the socio-  
144 demographic characteristics of the respondents.

145

146 >> Insert Table 1

147

148

149 *Measures*

150 Before this quantitative study, the authors had conducted a web-based free word  
151 association test (n=211) to qualitative elicit Chinese consumers' perceptions towards  
152 lobster (see Appendix for further details). The 12 most-frequent perceptual classes (n≥  
153 9) were: *Delicious, Expensive, Seafood, Umami, Spicy and hot, Nutritious, Enjoy, Sea,*  
154 *Upscale, Red, Appetite and Risk in illness* (For more details about the technique of  
155 web-based word association test please refer to Wang et al., 2016).

156 Based on the insights from the word association test, 15 items (shown in Table  
157 2) were selected to quantitatively examine participants' perceptions regarding lobster.  
158 Participants were asked to indicate their degree of agreement with each of the 15  
159 statements shown in Table 3 on a seven-point Likert agreement scale, with response  
160 categories: 1= Totally disagree, 2= Disagree moderately, 3= Disagree slightly, 4=  
161 Neither agree nor disagree, 5= Agree slightly, 6= Agree moderately and 7= Totally  
162 agree. Participants were shown the 15 statements from the online questionnaire in a  
163 random order to increase the validity of the study.

164

165 >> Insert Table 2

166 Participants' general image towards lobster was measured by the questions:  
167 "When you think about the image you have of 'lobster', how would you describe your  
168 personal feelings about it?" The answer categories were presented on a 7-point  
169 interval scale: 1= very negative, 2= moderately negative, 3= slightly negative, 4=  
170 neither negative nor positive, 5= slightly positive, 6= moderately positive, and 7=  
171 very positive. This design was developed from a previous study exploring European  
172 consumers' general image of traditional foods (Almli et al., 2011).

173

174 *Data analysis*

175 The data was analyzed by using SPSS 24 and The Unscrambler X 10.4.1. Descriptive  
176 analyses (e.g. mean values) were conducted for all variables in relation to Chinese  
177 consumers' general image of and perceptions about lobster, in either the total sample  
178 or the two sub-samples of cities: Shanghai and Qingdao. Independent Samples T-tests  
179 (confidence interval = 95%) were conducted to recognize significant differences of  
180 the variables (mean values) across the city sub-samples 'Shanghai' and 'Qingdao'.

181 Cluster analysis was conducted using the perception items (Table 2) as  
182 segmentation variables. It followed a two-step design: hierarchical clustering with  
183 Ward's method and squared Euclidean distance was performed, followed by a K-  
184 means cluster analysis with the initial cluster centers from the first step (Wang,  
185 Gellynck et al., 2015). Cross-tabulation with  $\chi^2$  tests and One-way ANOVA tests  
186 (confidence interval = 95%) were used to recognize significant differences across the  
187 consumer segments based on variables of socio-demographics.

188 Partial least squares regression (PLSR) was employed to associate  
189 participants' perceptions with their general images about lobster in order to identify  
190 statistically significant perceptions that drove Chinese consumers to have positive or  
191 negative images towards lobster, with *Full-cross-validation* and *Jack-knife-*  
192 *uncertainty-testing* (95% of confidence interval) (Wang et al., 2015b). PLSR is a  
193 popular technique for analyses of the food consumer and sensory data in exploratory  
194 studies without requirement for hard-modeling-inputs (Almli et al., 2011; Wang et al.,  
195 2015b).

196

197

198 **Results and discussion**

199 *Perceptions towards lobster*

200 The mean values of perception-items for lobster range from 3.98 to 5.87 for the total  
201 sample, from 3.7 to 6.0 for Shanghai and from 4.09 to 5.74 for Qingdao (Figure 1).  
202 The highest mean values are found for *Umami*, *Delicious*, *High in protein*, *Expensive*  
203 and *Nutritious* (mean scores above 5.5 for the total sample); while *Risk in illness* and  
204 *Spicy/hot* have the lowest mean values in either the total sample or the sub-samples of  
205 two cities (mean scores below or closed to 4).

206 Lobster (or eating lobster) is linked to taste-related perceptions *Umami*,  
207 *Delicious*, *Appetite*, *Chinese flavour*, *Western flavor* and *Spicy/hot* by Chinese  
208 participants. This confirms the importance of taste preference on consumers' seafood  
209 choice (Birch et al., 2012; Johnston and Roheim, 2006). Scientists have clarified  
210 Umami as a typical taste for seafood, and it is very familiar to consumers in East Asia  
211 (e.g. China and Japan) because of the long history of using umami-tasting recipes and  
212 ingredients for cooking (Komata, 1990; Kurihara, 2009; Nakayama and Kimura,  
213 1998). Spicy and hot can be recognized in Chinese local dishes and cuisines,  
214 especially in dishes with Sichuan and Hunan styles, which are two of the most  
215 popular local cuisines in China (Liu and Jang, 2009; Zhao, 2003). As such, it is  
216 reasonable for Chinese participants to associate lobster with the specific tastes: umami  
217 and spicy/hot. Furthermore, Chinese participants express their preferences for Chinese  
218 and Western style lobster dishes. This reflects the clash between Chinese and Western  
219 dietary preferences in this emerging country; China is experiencing a dietary  
220 consumption pattern that is inclined towards Westernisation as well as being  
221 influenced by Chinese dietary traditions (Wang et al., 2016).

222 Apart from taste-related perceptions, another sensory-related perception is  
223 linked to lobster by Chinese participants- the *red colour* (after being cooked). The  
224 influence of colour has generally not been mentioned in previous studies related to  
225 seafood consumer behaviour. The findings in this study are in line with the influences  
226 of sensory factors on dish preferences by Chinese consumers; an excellent dish should  
227 meet their expectations in terms of colour, smell and taste (Wan, 1995; Wang et al.,  
228 2016).

229 Lobster is associated with health-related perceptions *Nutritious* and *High-in-*  
230 *protein*. This corresponds with previous studies showing that eating seafood is  
231 considered healthy behaviour by consumers (Birch et al., 2012; Jacobs et al., 2015;  
232 Pieniak et al., 2008; Trondsen et al., 2004a, b; Verbeke et al., 2007).

233 A food-safety-related perception (*Risk-in-illness*) is linked to lobster by  
234 Chinese participants. Previous studies show consumers are highly concerned about  
235 food-safety issues surrounding seafood consumption, particularly for consumers in  
236 China (Acebrón et al., 2001; Hu et al., 2014; Wang et al., 2013). However, *Risk-in-*  
237 *illness* is not a high-frequent and high-scored perception-item in both the qualitative  
238 web-association test (see Appendix) and the quantitative survey. China's lobster  
239 market has been dominated by developed countries (e.g. New Zealand, Australia, U.S.  
240 and Canada) (Burman, 2017) and seafood from developed countries are often viewed  
241 as being more safety assured than those from developing countries (Acebrón et al.,  
242 2001; Fabinyi and Liu, 2014a, b; Wang et al., 2013); this might be the reason that  
243 Chinese participants pay less attention to safety-issues related to lobster.

244 Although having the *Expensive* perception, Chinese participants consider  
245 eating lobster as being *Upscale* and *Enjoyable*. This may be caused by the fact that  
246 luxury seafood consumption has special symbolic meanings and social networking  
247 functions in China. For example, showing high social status and establishing

248 relationships with people of higher social status is important in China (Fabinyi and  
249 Liu, 2014a, b).

250 Chinese participants associate lobster with *Sea* and *Seafood* in the free word  
251 association test (see Appendix) and they express their willingness of eating lobster as  
252 it is seafood and from sea. This reflects the traditional importance of seafood in  
253 dietary patterns of East Asian countries (e.g. China and Japan) that results in the  
254 strong influence of East Asia on the global seafood market and demand (Clarke, 2004;  
255 Fabinyi and Liu, 2014a, b).

256 Independent Samples T-tests reveal significant differences between the two  
257 cities for perception-items *Umami*, *Delicious*, *High in protein*, *Upscale*, *Appetite*,  
258 *Enjoy*, *Chinese flavour*, *Western flavor* and *Spicy/hot*. Consumers in Shanghai are  
259 more likely to eat lobster dishes in a *Western flavour* and to consider lobster or eating  
260 lobster as being *umami*, *delicious*, *high in protein*, *upscale*, *bring back appetite* and  
261 *enjoyable* than their counterparts in Qingdao. While consumers in Qingdao are more  
262 willing to have lobster dishes with Chinese or Spicy/hot flavour than their  
263 counterparts in Shanghai. Different development levels between China's first-tier and  
264 second-tier cities may cause this discrepancy. As a first-tier city, Shanghai has greater  
265 wealth and stronger consumption-power for imported products (e.g. luxury seafood)  
266 and a more Westernised dietary consumption pattern than second tiered cities (e.g.  
267 Qingdao) (Liu et al., 2011; Wang et al., 2015b; Wang et al., 2017). Therefore,  
268 consumers in Shanghai are more experienced in lobster consumption and as a result  
269 perceive lobster more positively, and are more willing to accept Western-style lobster  
270 dishes than consumers in Qingdao.

271

272 >> Insert Figure 1

273 *Associate between perceptions and general image about lobster*

274 There is a clearly positive image of lobster among Chinese participants (a mean value  
275 of 5.12 on the positive anchor of answer categories for the total sample). Independent  
276 Samples T-test reveals significant differences between the two city sub-samples on  
277 the mean values of participants' general images of lobster. Consumers in Shanghai  
278 have a general image of lobster more positive than that by their counterparts in  
279 Qingdao.

280 Table 3 presents the results of the three PLSR models that associate  
281 consumers' perceptions with their general images towards lobster for the total sample  
282 and the sub-samples of two cities. The three models explain from 23% to 35% (cross-  
283 validations from 19% to 31%) of variance in general image for two PLSR factors. The  
284 low variances indicate the very personalised association between perceptions and  
285 general image about lobster so that no common model is suitable for all participants  
286 (Almli et al., 2011; Wang et al., 2015b).

287 Chinese participants' general image of lobster is positively linked to taste-  
288 related perceptions such as (*Delicious*, *Umami*, *Appetite* and *Western flavour*) and  
289 negatively linked to Chinese-taste-related perceptions (*Spicy/hot* and *Chinese flavor*)  
290 in the total sample and/or the sub-samples of two cities. This again confirms the vital  
291 impact of taste preference on consumer seafood choice as mentioned in Section 4.1  
292 (Birch et al., 2012; Johnston and Roheim, 2006). However, previous studies have  
293 minimal contributions to knowledge about the influences of cuisine styles on  
294 consumer choice of seafood. Chinese cuisines and Western cuisines have great  
295 differences in cooking traditions and dish styles, and they both significantly influence  
296 the modern food consumption pattern in China (Wang et al., 2017). Although some



297 studies mention that Chinese people have their own traditional ways to cook seafood  
298 (Fabinyi and Liu, 2014a; Hu et al., 2014), no study presents consumer-based  
299 empirical knowledge on how the Chinese people's cooking approach influence  
300 consumer choice of luxury or even lower-value seafood. The findings from this  
301 current study indicate the negative impact of Chinese cooking approaches on the  
302 general image of lobster in Chinese participants' minds. By contrast, the Western  
303 cooking approach has positive influence on Chinese participants' general image of  
304 lobster. This corresponds with the positive attitudes towards Western food products  
305 by Chinese consumers in that Western-style food is perceived as being aesthetically  
306 pleasing and a way to show high social status (Curtis and McCluskey, 2007; Wang et  
307 al., 2017; Zhou and Hui, 2003).

308 Chinese participants' general image of lobster is positively associated with  
309 health-related perceptions (*Nutritious* and *High in protein*) and negatively associated  
310 with the safety-related perception (*Risk in illness*) in the total sample and/or the sub-  
311 samples of two cities. This is in line with previous findings that 'good for health' is a  
312 main driver for consumers to eat seafood products; while increased food-safety-  
313 perceptions is a main reason that decreases their seafood consumption (Acebrón et al.,  
314 2001; Birch et al., 2012; Jacobs et al., 2015; Pieniak et al., 2008; Wang et al., 2013).  
315 Although Chinese participants pay less attention to safety-issues about lobster as  
316 mentioned in Section 4.1, the concern about risk in illness is still a statistically  
317 significant factor driving them to have a negative image of it.

318 Chinese participants' general image of lobster is positively liked to perceptions  
319 *Enjoy* and *Upscale* in the total sample and/or the sub-samples of two cities. This  
320 confirms again the important symbolic meanings and social networking functions of  
321 luxury seafood consumption in China as mentioned in Section 4.1.

322 Previous studies reveal that price is an important factor with negative  
323 influence on seafood consumption (Birch et al., 2012; Dasgupta et al., 2010; Myrland  
324 et al., 2000). However, the current study does not find a statically significant  
325 relationship between the perception-item *Expensive* and participants' general image of  
326 lobster. This may be a result of particular consumption patterns and culture related  
327 effects of seafood in China. Chinese consumers consider seafood as a premium  
328 product and prefer to consume it at food service sectors (e.g. restaurants and hotels) in  
329 order to enhance their face consciousness and networking with important people (e.g.  
330 business and political partners) (Bao et al., 2003; Clarke, 2004; Fabinyi, 2012; Fabinyi  
331 and Liu, 2014a, b; Fabinyi et al., 2016). As such, 'price' may not be an important  
332 factor influencing luxury seafood (e.g. lobster) consumption for Chinese consumers.

333

334 >> Insert Table 3

### 335 *Consumer segments based on perceptions towards lobster*

336 The cluster analysis results in a three-segment solution. Participants are clustered  
337 based on the 15 perception-items about lobster. Table 4 shows the size and mean  
338 score per segmentation variable for the total sample. Segment 1 contains 35.4% of the  
339 total sample. It has the highest mean scores on 10 perception-items *Delicious*,  
340 *Seafood*, *Western flavor*, *Expensive*, *Umami*, *Nutritious*, *High in protein*, *Sea*, *Upscale*  
341 and *Appetite*, and the lowest mean scores on the perception-items *Risk in illness*,  
342 *Spicy/hot* and *Chinese flavour* among all consumer segments. As such, they consider  
343 lobster or eating lobster as being delicious, expensive, umami, nutritious, high in  
344 protein, and upscale; they eat lobster as it is seafood and 'from the sea', and it  
345 enhances their appetite; they prefer lobster dishes cooked in a Western way to in a

346 Chinese way (such as spicy and hot flavour); and they are not concerned about getting  
347 ill from eating lobster. It appears that participants of this segment have a generally  
348 positive impression about lobster, and they love lobster-dishes of Western-style and  
349 dislike lobster dishes of Chinese-style. As a result, Segment 1 is named as ‘Western-  
350 flavour-lover’.

351 Segment 2 accounts for 32.8% of the total sample. One-way ANOVA tests  
352 reveal that there is no significant difference of the mean scores for 8 perception-items  
353 Delicious, Expensive, Umami, Nutritious, High in protein, Upscale, Enjoy and  
354 Appetite between Segment 1 and Segment 2, and for the perception-item *Risk in*  
355 *illness* between Segment 2 and Segment 3. The mean scores of 4 perception-items  
356 (*Delicious, Seafood, Western flavor, Red colour* and *Sea*) are between those for the  
357 other two segments and locate on the positive anchor of response categories (above  
358 4). Similar to Segment 1, consumers of Segment 2 have a generally positive  
359 impression about lobster, though they worry about getting ill from eating lobster; this  
360 is similar with those in Segment 3 and different from those in Segment 1. Segment 2  
361 is typified by the highest mean scores for the perception-items *Spicy/hot* and *Chinese*  
362 *flavor*, therefore, Segment 2 is labeled as ‘Chinese-flavour-lover’.

363 Segment 3 contains 31.8% of the total sample. This segment has the lowest  
364 mean scores on 12 perception-items *Delicious, Seafood, Western flavor, Expensive,*  
365 *Umami, Nutritious, High in protein, Red colour, Sea, Upscale, Enjoy* and *Appetite*. In  
366 particular, the mean scores of 6 perception-items locate on the negative anchor of  
367 response categories (below 4): *Seafood, Western flavor, Sea, Upscale, Enjoy* and  
368 *Appetite*. As such, participants in this segment disagree that they eat lobster as it is  
369 seafood and from the sea; they dislike eating lobster dishes cooked in a Western way;  
370 they do not think that eating lobster is upscale and it doesn't enhance their appetite;  
371 and they do not enjoy eating lobster. Participants in this segment are also less likely to  
372 consider lobster as being delicious, umami, expensive, nutritious and high in protein,  
373 and to like the red colour of lobster (after being cooked) in comparison with their  
374 counterparts in the other two segments. Therefore, this segment is named as  
375 ‘Negative-believer’.

376

377 >> Insert Table 4

378 Cross-tabulations with  $\chi^2$  tests and One-way ANOVA tests revealed  
379 significant differences across the three segments for some socio-demographic  
380 variables, including city, income, marital status, educational level, occupation and age  
381 (Table 5). The ‘Western-flavour-lover’ segment has the highest percentages of  
382 participants among the three segments who live in Shanghai; have higher personal  
383 income monthly (727-1451USD and above 1452USD) and a higher-level in  
384 employment (managers); are married, and have a higher educational background  
385 (bachelor, master or above). This segment also has the older mean age and a much  
386 larger percentage of older-aged participants (31-40 and  $\geq 41$ ) than the other two  
387 segments. This fits with the characteristics of China’s middle-class consumers (high-  
388 income, high educational level, high-level position, living in first-tier cities) who are  
389 the main consumption force for imported luxury seafood in recent years (Burman,  
390 2017; Fabinyi et al., 2016; Wang et al., 2017). Furthermore, the findings are partly in  
391 line with the previous findings that seafood consumption is positively linked to  
392 income, educational level and age (Cardoso et al., 2013; Myrland et al., 2000;  
393 Trondsen et al., 2004a, b; Pieniak et al., 2010; Salladarré et al., 2016; Verbeke et al.,  
394 2007).

395 By contrast, the ‘Negative-believer’ segment has the highest percentages of  
396 participants among the three segments, who live in Qingdao; have lower personal  
397 income (0-726USD) and a lower level of employment (student and worker); are single  
398 and have a lower educational background (Junior college and below). The segment  
399 has the lowest percentage of participants who have a higher job position (managing  
400 employees). Therefore, luxury seafood exporters and marketers should avoid  
401 promoting their products to Chinese consumers with the socio-demographic  
402 characteristics of this segment.

403 The ‘Chinese-flavour-lover’ segment and the ‘Negative-believer’ segment are  
404 similar in socio-demographic distribution and both worry about getting illness from  
405 eating lobster dishes. However, the ‘Chinese-flavour-lover’ segment has positive  
406 perceptions towards lobster and Westernised lobster dishes; this is a great difference  
407 from the ‘Negative-believer’ segment. Therefore, consumers in this segment may  
408 become another marketing target in the future for global luxury seafood marketers and  
409 exporters. The following marketing promotions are recommended for this consumer  
410 segment: 1) highlight the health safety-assurance of luxury seafood; and 2) make them  
411 more experienced with Westernised luxury seafood dishes which should give these  
412 consumers a more positive image of luxury seafood (due to the PLSR result that the  
413 general image of lobster by Chinese participants is significantly and positively linked  
414 to the perception-item *Western-flavour*).

415

416 >> Insert Table 5

#### 417 **Conclusions and limitations**

418 The demand for luxury seafood in China has been increasing dramatically in recent  
419 years. A need exists for global exporters and marketers to better understand Chinese  
420 consumer behaviour towards luxury seafood. This is the first study to present  
421 information about consumers’ perceptions, general image, and segments towards  
422 luxury seafood in the largest East-Asian country- China. The findings from China  
423 address the lack of understanding of seafood consumer behaviour in East Asia and is a  
424 good contribution to a general theory of consumers’ perceptions and consumption  
425 towards seafood across national borders and cultures (for both the East and the West).  
426 The findings may also have reference significance for consumer behaviour of luxury  
427 seafood in other regions, especially in other East-Asian countries, for example Japan  
428 and South Korea.

429 The findings can help global seafood exporters and marketers to better  
430 understand Chinese consumers in order to develop effective marketing strategies for  
431 their luxury seafood products in this huge market. Efforts should be made to enhance  
432 Chinese consumers’ positive image towards their luxury seafood products such as to  
433 strengthen Chinese consumers’ impressions about the assurance of umami taste, high  
434 nutritional value and/or safety of the luxury seafood products. Furthermore, global  
435 exporters and marketers should consider ‘Western-flavour-lover’ and ‘Chinese-  
436 flavour-lover’ as their marketing focus, as these two consumer segments are the major  
437 and potential consumption forces for luxury seafood in China.

438 Nevertheless, the findings of this study are subject to some limitations. First,  
439 the data for this study was collected from an online panel of people who had  
440 consumed lobster before. As such, the sample did not fully represent general Chinese  
441 consumers. Second, the perceptions were elicited for a luxury crustacean-lobster.  
442 Some of the perception-items, for example “*Red-colour*”, may not be congruent with  
443 the characteristics of other luxury seafood that are not crustaceans such as shark fin

444 and sea cucumber. Third, the study focused on Chinese consumers' perceptions and  
445 general image, and we did not include instruments to explore their consumption  
446 experiences or purchase intentions towards lobster. Future studies involving  
447 consumption instruments are recommended.

448

449

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## 623 Appendix

624 In order to gain a preliminary insight into Chinese consumers’ perceptions of lobster,  
625 qualitative data was collected by means of a web-based free word association test in  
626 November 2016 (Wang et al., 2016). Participants were asked to provide the first three  
627 words came into their minds when they were presented with the stimulus word-  
628 lobster; they were asked to avoid specific foods, dishes or brand names (e.g. Yu-  
629 Shiang Shredded Pork, Dumplings, Hamburger, KFC or Haidilao) (Guerrero et al.,  
630 2010; Wang et al., 2016). The qualitative survey was randomly sent to members on  
631 the sample panel of a Chinese research agency, with strict identification practices  
632 based on socio-demographic characteristics and region distributions (through IP  
633 addresses). A valid sample of 211 participants was obtained. Table I shows the  
634 geographic and demographic characteristics of the respondents.

635  
636 >> Insert Table I

637  
638 The elicited words were grouped and named into classes (Guerrero et al., 2010;  
639 Wang et al., 2016). Double answers (e.g. elicited words with same semantic meanings

640 and grouped into the same class) from the same participant were deleted before the  
641 grouping process (Wang et al., 2016). The frequency of classes was calculated in  
642 order to show the important perceptions (the elicited words or classes with high  
643 frequencies) towards lobster in Chinese consumers' minds.

644         Among the 633 elicited words for the stimulus word 'lobster' obtained from the  
645 word association test, 210 (35%) words were different. These 210 words were  
646 grouped into classes and Table 4 shows the examples of elicited words grouped into  
647 the 12 most-frequent classes that have frequencies higher or close to 10. The elicited  
648 classes for lobster were dominated by the term *Delicious*, with a frequency much  
649 higher than other classes; around 72.5% of participants associated 'lobster' with  
650 delicious-relevant words. Based on the 12 most-frequent classes, 15 statements (Table  
651 II) were developed to explore Chinese consumers' beliefs about lobster in the  
652 quantitative consumer survey.

653

654 >> Insert Table II



Table 1 Socio-demographic details of the sample in the survey

		Total sample	Shanghai	Qingdao
Sample size (n=)		882	427	455
Gender				
	Male	50.9%	45.7%	54.8%
	Female	49.1%	54.3%	45.2%
Marital status				
	Married	59.0%	56.0%	61.8%
	No, but has a partner	25.2%	15.5%	16.3%
	Single	15.9%	28.6%	22.0%
Age				
	Mean value	31.74	32.31	31.21
	18-30	49.2%	47.3%	51.0%
	31-40	34.7%	33.3%	36.0%
	≥41	16.1%	19.4%	13.0%
Personal income (USD, monthly)				
	0-726	51.0%	40.3%	61.1%
	727-1451	36.5%	39.8%	33.4%
	≥1452	12.5%	19.9%	5.5%
Education				
	Junior college and below	36.3%	28.8%	43.3%
	Bachelor degree	49.4%	53.9%	45.3%
	Master degree and above	14.3%	17.3%	11.4%
Occupation				
	Managing employee	26.1%	26.9%	25.3%
	Salaried employee	32.3%	37.0%	27.9%
	Student	16.4%	17.3%	15.6%
	Worker	7.6%	6.6%	8.6%
	Self-employed	8.3%	3.7%	12.5%
	Other	9.3%	8.4%	10.1%
Household size				
	Mean value	3.62	3.50	3.74

Table 2 Statements to recognize Chinese consumers' perceptions towards lobster in the quantitative survey

Class	Statement
Delicious	Lobster is delicious.
Expensive	Lobster is expensive.
Seafood	I want to eat lobster as it is seafood.
Umami	Lobster tastes umami.
Spicy and hot	1) I prefer to eat lobster dish with flavour of spicy and hot.
(Chinese flavour)	2) I like eating lobster dish that is cooked in Chinese way.
(Western flavour)	3) I like eating lobster dish that is cooked in Western way.
Nutritious	1) Lobster is rich in nutrients.
(Protein)	2) Lobster is high in protein content.
Enjoy	I like the feeling when eating or thinking about lobster.
Sea	I want to eat lobster as it is from sea.
Upscale	Eating lobster is upscale.
Red	I like the red colour of cooked lobster.
Appetite	Lobster can bring back my appetite.
Risk in illness	I am very concerned about the possibility of getting ill from eating lobster (caused by problems of food safety, bacteria, heavy metals, allergy and so on).

Table 3 Results of the PLSR models for association between perceptions and general image about lobster in Chinese consumers' minds

Beliefs (X)	Lobster as a general concept (Y)		
	Total sample	Shanghai	Qingdao
Delicious	+	ns	+
Seafood	ns	ns	ns
Spicy/hot	-	-	-
Chinese flavour	-	-	ns
Western flavour	+	ns	+
Expensive	ns	ns	ns
Umami	+	+	ns
Nutritious	+	ns	+
Protein	+	ns	ns
Red colour	ns	ns	ns
Sea	ns	ns	ns
Upscale	ns	+	ns
Enjoy	+	+	+
Appetite	+	+	ns
Risk in illness	-	-	-
Calibration	28	35	23
Validation	26	31	19

*Note:* ns= no significant; '+'= significantly positive relationship; '-'= significantly negative relationship; Y= dependent variable of PLSR (general image of lobster); X= independent variable of PLSR (beliefs about lobster).

Table 4 Sizes and mean scores of consumer segments based on their perceptions about lobster

Belief-item	Segment 1	Segment 2	Segment 3	F	p-Value
	Western-flavour-lover	Chinese-flavour-lover	Negative-believer		
Delicious	6.31 <sup>a</sup>	6.21 <sup>a</sup>	4.95 <sup>b</sup>	163.89	0.000
Seafood	5.26 <sup>a</sup>	4.79 <sup>b</sup>	3.40 <sup>c</sup>	114.73	0.000
Spicy/hot	2.14 <sup>a</sup>	5.69 <sup>b</sup>	4.26 <sup>c</sup>	437.42	0.000
Chinese flavour	4.20 <sup>a</sup>	5.35 <sup>b</sup>	4.81 <sup>c</sup>	45.13	0.000
Western flavour	5.63 <sup>a</sup>	4.69 <sup>b</sup>	3.67 <sup>c</sup>	136.81	0.000
Expensive	5.98 <sup>a</sup>	5.95 <sup>a</sup>	5.01 <sup>b</sup>	53.97	0.000
Umami	6.32 <sup>a</sup>	6.25 <sup>a</sup>	4.97 <sup>b</sup>	174.97	0.000
Nutritious	6.05 <sup>a</sup>	5.87 <sup>a</sup>	4.49 <sup>b</sup>	199.70	0.000
Protein	6.20 <sup>a</sup>	6.04 <sup>a</sup>	4.86 <sup>b</sup>	146.24	0.000
Red colour	5.38 <sup>a</sup>	5.81 <sup>b</sup>	4.30 <sup>c</sup>	93.37	0.000
Sea	5.25 <sup>a</sup>	4.89 <sup>b</sup>	3.29 <sup>c</sup>	138.44	0.000
Upscale	5.90 <sup>a</sup>	5.65 <sup>a</sup>	3.86 <sup>b</sup>	192.81	0.000
Enjoy	5.56 <sup>a</sup>	5.69 <sup>a</sup>	3.65 <sup>b</sup>	232.82	0.000
Appetite	5.72 <sup>a</sup>	5.58 <sup>a</sup>	3.67 <sup>b</sup>	226.46	0.000
Risk in illness	2.93 <sup>a</sup>	4.74 <sup>b</sup>	4.48 <sup>b</sup>	114.32	0.000
Segment size	312	289	281		
Share of the total sample (n=882)	35.4%	32.8%	31.8%		

*Note: a - c indicate significantly different means.*

Table 5 Socio-demographics of consumer segments based on their perceptions about lobster

	(Segment 1)	(Segment 2)	(Segment 3)
	Western-flavour-lover	Chinese-flavour-lover	Negative-believer
	(n=312)	(n=289)	(n=281)
<b>City***</b>			
Shanghai	58.3%	45.0%	40.9%
Qingdao	41.7%	55.0%	59.1%
<b>Gender</b>			
Male	48.4%	50.9%	53.7%
Female	51.6%	49.1%	46.3%
<b>Income***</b>			
0-726USD	40.1%	52.9%	61.2%
727-1451USD	41.7%	37.4%	29.9%
≥1452USD	18.3%	9.7%	8.9%
<b>Marital status**</b>			
Single	19.2%	25.6%	31.3%
No, but has a partner	14.7%	19.0%	13.9%
Married	66.0%	55.4%	54.8%
<b>Educational level***</b>			
Junior college and below	23.1%	41.5%	45.6%
Bachelor degree	60.9%	43.9%	42.3%
Master degree and above	16.0%	14.5%	12.1%
<b>Occupation**</b>			
Managing employee	31.4%	24.9%	21.4%
Salaried employee	34.9%	30.4%	31.3%
Student	11.5%	18.3%	19.9%
Worker	8.0%	4.5%	10.3%
Self-employed	5.1%	11.8%	8.2%
Others	9.0%	10.0%	8.9%
<b>Age***</b>			
Mean	33.86 <sup>a</sup>	30.33 <sup>b</sup>	30.85 <sup>b</sup>
18-30	36.9%	56.7%	55.2%
31-40	42.6%	32.2%	28.5%
≥41	20.5%	11.1%	16.4%
<b>Household size</b>	3.53	3.64	3.73

Note: \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ ; a - c indicate significantly different means.

Table I Socio-demographic details of the sample in the web-based free word association test

		Total sample (n=211)
Gender	Male	53.6%
	Female	46.4%
Age	Mean value	33.1
	18-30	35.1 %
	31-40	53.6 %
	≥41	11.3 %
Personal income (USD, monthly)	0-726	23.2%
	727-1451	61.6%
	≥1452	15.2%
Region division one	North	44.1%
	South	55.9 %
Region division two	First-tier city	33.2%
	Other cities	66.8%
Eaten lobster before	Yes	97.2%
	No	2.8%

Table II Examples of elicited words grouped in the same classes and class frequencies in the web-based word association test using ‘lobster’ as stimulus

Class	Word examples	Class frequency
Delicious	Delicious, tasty, good-taste, delicious-food...	153
Expensive	Expensive, high-price, very-expensive ...	62
Seafood	Seafood, seafood-product	48
Umami	Umami, umami-taste, very-umami...	32
Spicy and hot	Spicy, hot, spicy-taste, spicy-and-hot...	31
Nutritious	Nutrition, nutritious, protein, high-in-protein...	29
Enjoy	Enjoy, like, good, excited, happy...	17
Sea	Sea, deep-sea, from-sea, ocean...	17
Upscale	Upscale, top-grade, feast, gain-face, ostentatious...	15
Red	Red, red-colour	15
Appetite	Appetite, want-to-eat, mouth-waters...	12
Risk with illness	Allergy, unsanitary, illness, heavy-metal, bacteria...	9

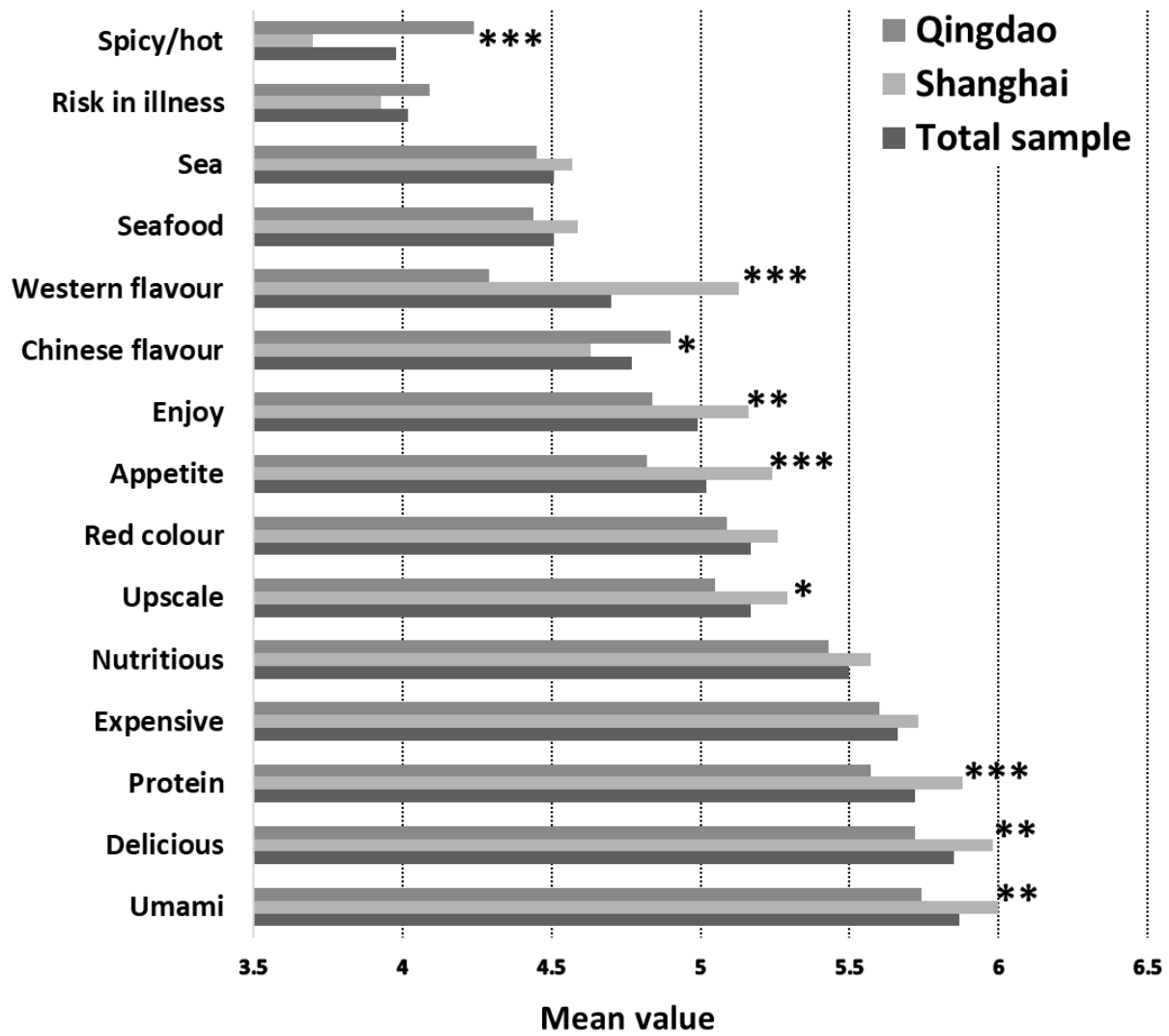


Figure 1 Mean values of perceptions about lobster for the total sample and the city sub-samples  
*Note:* \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ .