

1     **Impact of information and Food Technology Neophobia in consumers’**  
2             **acceptance of shelf-life extension in packaged fresh fish fillets**

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24    **Abstract**

25    Modern consumers are increasingly asking for sustainability in food production. However, in real life,  
26    they may be skeptical about novel food technology and refuse to buy innovative products. Providing  
27    positive information about the innovations may reduce consumers’ skepticism and incentivize firms  
28    R&D activity. Accordingly, this paper aims to test the effect of informative messages on consumers’

29 acceptance of shelf-life extension on fresh packaged fish. The impact of information is tested on a  
30 sample of consumers from Northern and Southern Italy that evaluated an innovatively packaged  
31 portion of fresh sea bream (*Sparus aurata*). The results of the survey highlight that different  
32 information strategies may increase positive attitudes towards some attributes of the new product.  
33 However, the most important antecedent of attitudes is the individual Food Technology Neophobia.  
34 The research provides a starting point in the study of the effect of informative messages on consumers'  
35 acceptance of shelf life extension technology on fresh fish and its relationship with neophobia.

### 36 **Highlights**

- 37 • Consumers are often skeptical towards new food technologies and innovative foods
- 38 • Information may reduce consumers' food technology neophobia
- 39 • The effect of two information treatments on consumers' attitudes are tested
- 40 • Results show that information mildly impact consumers' preferences
- 41 • Food technology neophobia is the most relevant antecedent of consumers' skepticism

42 **Keywords:** food packaging; shelf-life extension; food technology neophobia, fish products;  
43 information intervention; consumer attitudes

44

## 45 **1. Introduction**

46 Consumers are increasingly searching for sustainable, safe and healthy products (Fiore, Gallo,  
47 Tsoukatos, & La Sala, 2017; Cafarelli, La Sala, Pellegrini, & Fiore, 2017). In this sense, consumers  
48 should consider as a positive attribute of foods the use of new packaging technologies assuring shelf-  
49 life extension (SLE) that increases the sustainability of food products with no loss in terms of sensory  
50 characteristics and nutritional value. On the other hand, due to natural aversion to novelties, consumers  
51 may oppose novel foods (Costa-Font, Gil & Traill, 2008; Dovey, Staples, Gibson, & Halford, 2008;  
52 Siro, Kápolna, E., Kápolna, B., & Lugasi, 2008; Barrena & Sánchez, 2013) and new food technologies  
53 (Cardello, Schutz, & Leshner, 2007; Siegrist, Cousin, Kastenholtz, & Wiek, 2007; Chen, Anders, & An,  
54 2013; Lusk, Roosen & Bieberstein, 2014). Thus, as inventing and promoting new products are  
55 expensive activities (Esbjerg, Burt, Pearse, & Glanz-Chanos, 2016) food firms often avoid innovation.  
56 The Eurostat Report on Innovation statistics (Release March 2017) confirms this interpretation. Indeed,  
57 during the period 2012-2014, less than a quarter of the surveyed European firms introduced a new  
58 product on the market. The vast majority of non-innovators stated that they were not motivated to  
59 innovate and, when asked, the most frequent deterring factor was the low level of market demand.  
60 These data suggest that consumers' attitudes towards novel products is one of the leading preventing  
61 factors for industry to invest on R&D activities.

62 The aversion to novel foods derives from a partly unjustified sense of risk of buying something that is  
63 perceived as dangerous or might not satisfy consumers' quality and safety expectations (Pliner, Pelchat  
64 & Grabsky, 1993). This inappropriate phobia towards novel foods has been called "food neophobia" or  
65 "new food technology neophobia" to specifically designate consumers' averseness towards food  
66 produced by using new processes (Sjöberg, 2000; Cox & Evans, 2008; Faraji-Rad, Melumad, & Johar,  
67 2017; Damsbo-Svendsen, Frøst, & Olsen, 2017). The public and private interest for innovation, related

68 to expected increase of food safety and security, taste and convenience at lower price and improvement  
69 of nutritional properties (Lusk et al., 2014) encouraged researchers to search efficient strategies to  
70 increase consumers' acceptance of new products.

71 The present paper contributes to the literature by testing the impact of two different informative  
72 messages on acceptance of a shelf-life extension on a traditional fresh fish product. Despite the  
73 improvement offered by shelf-life extension technologies, fish consumers may not appreciate the  
74 innovation in fresh packaged fish, because of very traditional food purchasing habits (Honkanen,  
75 Olsen, & Verplanken, 2005), and the high heterogeneity of fish products in the market (Gaviglio,  
76 Pirani, & Demartini, 2013). Thus, an on-line survey on shelf life extension (SLE) technology by 10  
77 days on fresh fish has been conducted. Participants valued a portion of 400gr of fresh sea bream fillets  
78 (*Sparus aurata*) presented as packaged by using a new package. Two information treatments  
79 randomized between subjects have been introduced in order to evaluate the best message to increase  
80 consumers' acceptance of the product.

81 The remainder of the text is organized into four paragraphs. Paragraph 2 presents the review of the  
82 literature review on consumer attitudes towards fish and novel food and the role of information in  
83 changing consumers' attitudes. Paragraph 3 discusses the materials and methods and the statistical  
84 approach used in the analysis. Finally, paragraphs 4 and 5 are devoted to the results and their  
85 discussion respectively.

## 86 **2. Theoretical background**

87 The present paper discusses the results of an experiment that aims to increase the attitudes towards a  
88 novel fresh fish product using different informative messages and to explore the role of neophobia on  
89 product acceptance. Thus, the literature review takes into consideration three main aspects: (1) the  
90 consumers attitudes towards fresh fish products, and their relationships with other individual

91 characteristics and fish consumption; (2) the relationship between neophobia, with specific reference to  
92 new food technology neophobia, and novel food acceptance; and, (3) the role of informative messages  
93 in changing consumers attitudes towards foods.

#### 94 *2.1 Consumers attitudes toward fresh fish products*

95 According to FAO and WHO (2011), eating fresh fish products guarantees health benefits such as  
96 protecting against depression and cardiovascular diseases, and in controlling the cholesterol levels in  
97 blood. Despite several WHO promotion strategies, fish consumption continues to be low and relevant  
98 differences in consumption levels are measured across countries (Zhou, Jin, Zhang, Cheng, Zeng, &  
99 Wang, 2015; Altintzoglou & Heide, 2016). Due to the role of fresh fish products in a balanced, healthy  
100 and high quality diet, the growing variety in consumer's dietary needs and their low consumption  
101 levels, the study of consumers' perception and attitudes towards fresh fish products reached more and  
102 more attention over the last decades. The latest studies show that perception of quality attributes plays a  
103 relevant part in buying behavior and consumers' attitudes toward fresh fish products (Wang, Zhang,  
104 Mu, Fu & Zhang, 2009; Altintzoglou & Heide, 2016; Maciel, Sonati, Lima, Savay-da-Silva, Galvao  
105 and Oetterer, 2016;). An Italian study (De Vitiis, Carlucci, Nocella, Viscechia, Bimbo & Nardone,  
106 2018) investigates consumers' acceptance of a new fish burger that seems to overcome consumption  
107 barriers, thank to both convenience and health benefits (deriving from the functional enrichment with  
108 omega-3 fatty acids) and nutritional claims. Another study (Nicolosi, Fava, & Marcianò, 2019),  
109 focusing on Italy and Spain, highlights that the perception and attitudes towards fish products varies  
110 depending on local cultures and consumption habits. A Norwegian survey demonstrates that perception  
111 of quality of fish products certainly affects buying-behavior of fresh fish fillets. Furthermore, the  
112 perception of quality depends on subjective and objective knowledge about fish quality and social and  
113 individual characteristics (Altintzoglou & Heide, 2016). A study made in China (Zhou et al., 2015)

114 offers evidences that economic and socio-demographics factors act as determinants of fish  
115 consumption. Through the estimation of a Marshallian demand function, authors found that  
116 consumption relates positively to household income and knowledge of health issues. A mixed research  
117 investigated the fish consumption habits of consumers from Brazil and Portugal (Maciel et al., 2016)  
118 and proved that it is firstly linked to the quality attributes such as country of origin, the certification of  
119 sustainable production methods. As a secondary determinant of consumption, the same research reports  
120 the preparation and preservation methods and the marketing strategies adopted for the fish products. In  
121 line with this research, some authors investigated consumers residents in the city of Corumbá, Mato  
122 Grosso do Sul State, Brazil (Maciel, Savay-Da-Silva, Galvão & Oetterer, 2015) and demonstrate that  
123 the sensory and quality characteristics of products are the key drivers in shaping fish consumption  
124 habits.

## 125 *2.2 Consumer aversion to novel food and New Food Technology Neophobia*

126 The global food context is characterized by the increasing demand for functional, convenience and  
127 healthy foods. Albeit new food technologies help to respond to the recent market needs, some  
128 consumers oppose these novelties, mostly due to unmotivated perception of risky outcomes. For  
129 example, despite food irradiation is a useful, cheap and safe technology with many application in food  
130 conservation, European consumers seem not appreciate it (Diehl, 2002). Consumers are also generally  
131 averse to genetically modified food and do not differentiate between cisgenically vs transgenically  
132 modified products (Delwaide, Nalley, Dixon, Danforth, Nayga, Van Loo & Verbeke, 2015) even if  
133 heterogeneity in preferences has been found, being the younger consumers the less averse towards  
134 GMOs (Hu, Hünneimyer, Veeman, Adamowicz & Srivastava, 2004). Consumers show their reluctance  
135 also against functional foods produced using new technologies and unfamiliar ingredients, being the  
136 European normally more averse than American towards these wide category of food (Siro et al., 2008).

137 According to Pliner et al. (1993) consumers' opposition towards novel products may relate to the  
138 perception of the novel food as harmful or the perceived risk that new foods will dislike their  
139 expectations. The researchers traditionally refer to the aversion to novel food as "neophobia" (Pliner &  
140 Hobden, 1992; Damsbo-Svendsen et al., 2017) and, more recently, started using the term "new food  
141 technology neophobia" (Cox & Evans, 2008) to indicate consumers' reluctance towards food produced  
142 using new processes. The "new food technology neophobia" has several facets either relate to  
143 consumers' aversion to try novel food products either to accept new production and processing  
144 technologies (Cox & Evans, 2008; De Steur, Odongo, & Gellynck, 2016;).

### 145 *2.3 Changing consumers' attitudes using information*

146 Consumers might oppose novel foods because they are not aware of the method used for their  
147 production (Cardello et al., 2007). Thus, providing consumers with information about innovative  
148 technologies should reduce their information gap (Contò, Santini, La Sala, & Fiore, 2016; Barsics,  
149 Caparros Megido, Brostaux, Blecker, Haubruge, & Francis; 2017). Some researches confirm that this  
150 approach can be effective in the creation of positive attitudes towards foods and foods technologies. A  
151 study conducted in New Zealand (Lee, Lusk, Miroso, & Oey, 2016) offers evidences that information  
152 positively influenced consumers' attitudes towards apple juices that was untreated and processed using  
153 high hydrostatic pressure, while it had no effect on pulsed-electric field treated juice. A research  
154 conducted in Europe and USA involving experimental auctions (Lusk, House, Valli, Jaeger, Moore,  
155 Morrow, & Traill, 2004) proved that providing information about potential benefits of GMOs decrease  
156 the money that consumers accepted to buy the GM food. Researchers focused also on the quantity of  
157 information provided. Also in this case, there evidences that information shape consumers evaluation  
158 of targeted products. For instance, the study of Pohlman, Wood, & Mason (1994) proved that the  
159 participation to an educational program improved the attitudes towards food irradiation technologies,

160 while McCollough & Ostrom (1974) proved that mere exposure to similar short messages persuaded  
161 involved positive evaluation of daily-use products. However, the information does not always provide  
162 positive changes in attitudes. For instance, Jaeger, Knorr, Szabó, Hámori, & Bánáti (2015) conducted a  
163 qualitative research and measured that providing description changed positively and negatively the  
164 evaluation of new food technologies in different group of consumers.

### 165 **3. Materials and Methods**

166 In order to increase the attitudes towards a novel fresh fish product using information and explore the  
167 role of neophobia on product acceptance, we firstly analysed the negative values attached to the  
168 product and created two informative messages targeting these specific adverse attributes. Secondly, we  
169 identified a set of dependent variables represented by the attitudes towards the technology and the  
170 product that might be influenced by information. Finally, we determined the set of covariates that may  
171 play a role in consumers attitudes toward the novel fresh fish product. These are represented by  
172 neophobia, socio-demographic characteristics and fish consumption habits.

#### 173 *3.1. Experimental design*

174 The investigation was conducted in Italy from January to June 2017 by using the Qualtrics® platform.  
175 This is based on two consecutive steps. The first step was a pilot study aimed to select the items for the  
176 product evaluation in the main questionnaire. During this study, 34 experts of fish products from  
177 academy (researchers on fish breeding and fish product safety) and private companies (producers,  
178 transformers and traders) and 52 lay people responded to a short qualitative questionnaire describing  
179 the perceived gains and losses of the proposed food technology<sup>1</sup>. At this step emerged that the most  
180 probable negative consequence of the SLE technology applied to fresh fish products was the perception

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<sup>1</sup> For sake of brevity, only the main results of the pilot study are described here, for those interested, all information are available upon request.



181 of less freshness and the decreasing of the quality of the product compared to the traditionally packaged  
182 products. On the other hand, the most valuable benefits of the new package for both experts and lay  
183 people were the ease of use and reduction in food waste. According to these results, we designed the  
184 second step, which represents the main study described in the present paper. This research involved an  
185 on-line survey distributed in the Lombardy and Apulia Regions, representative for North and South of  
186 Italy. At the end of the survey, out of 530 participants engaged, 418 (78.9%) completed the  
187 questionnaire. Thus, the questionnaire that were not finished were excluded from the analysis.  
188 Participants to the survey valued a fictional portion of 400gr of fresh sea bream fillets (*Sparus aurata*)  
189 that was presented as packaged using a new technology assuring SLE<sup>2</sup>. A specifically created picture of  
190 the product was presented during the survey with a claim indicating the “10 extra-days” of shelf-life  
191 guaranteed by the new technology (Figure 1).  
192 Furthermore, each respondent was randomly assigned to an experimental group characterized by a  
193 specific message aimed at persuading consumers of the goodness of the technology. In accordance to  
194 the objective of the research and building on the information gained from the pilot study, specific  
195 information treatment has been introduced in order to test the effect of different messages on  
196 consumers’ acceptance of SLE. As described in Table 1, people who has been randomly assigned to the  
197 first treatment represent the *Control* group, in fact they received no additional information a part of the  
198 description of the product. The second treatment informed consumers that SLE guarantees 10 extra-  
199 days of shelf life with no change in terms of product overall quality; this group of consumer has been  
200 coded as *Info\_Q*. The content of this information treatment aims to prevent the possible adverse effect  
201 of the use of packaging technology on the perception of the overall quality of the product. The third

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<sup>2</sup> This new technology consists of 2 steps: in the first step, the edible coating was optimized through the use of 5% sodium alginate solution and 7.5% calcium chloride solution in order to increase the shelf life of the sea bream fillet. After that, the edible coating is combined with Modified Atmosphere Packaging – MAP - (5% of O<sub>2</sub> and 95% of CO<sub>2</sub>) and the effect on shelf life is evaluated. It results in a SLE of 10 days.

202 treatment informed readers that SLE helps in decreasing food waste, which involves gains in term of  
203 economic and environmental impact. People assigned to this treatment composed *Info\_W* group.  
204 Finally, the fourth treatment contains both the information provided by the second and third treatment,  
205 thus, these participants are coded as *Info\_Q+Info\_W* group. It is worth noting that this experimental  
206 design allows to estimate the effect of informative message in term of type of information provided  
207 (*Info\_Q* vs *Info\_W*) and in term of quantity of information provided (*Control* vs *Info\_Q*; *Control* vs  
208 *Info\_W*; and, *Control* vs *Info\_Q+Info\_W*).

209 The measure of consumers' acceptance of fresh sea bream fillets packaged using SLE followed the  
210 information treatment. Consumers stated their perception of the product on three dimensions that have  
211 been estimated as follows:

- 212 ➤ Overall liking of the technology. This dimension is measured by a 10-point semantic  
213 differential scale, that describes the perception of convenience of the SLE (disadvantage vs.  
214 advantage);
- 215 ➤ Overall linking of the product. This dimension is measured by the mean of the stated agreement  
216 with 7-point Likert scales on four statements referring to the fresh sea bream fillets.  
217 Specifically, the items used are: 'The product is attractive', 'I would recommend it to my  
218 friends and relatives', 'I would buy it' and 'It looks good';
- 219 ➤ Perception of specific characteristics of the product. Seven semantic differential scales that  
220 captures the perception of different attributes of the product measure this dimension. These  
221 scales refer to 'taste and smell', 'environmental friendliness', 'healthiness', 'easy of cooking',  
222 'easy of storing', 'naturalness' and 'freshness'. These seven items are used separately in the  
223 analysis to accounts for the perception of the different characteristics that make up the product.

224 The questionnaire contains three more sections. The first one is devoted to the analysis of the  
225 acceptance of new food technologies, estimated via the Food Technology Neophobia Scale (FTNS -  
226 Cox & Evans, 2008), the measure of food technology knowledge and the attitudinal antecedents of  
227 food choice, estimated by using the Food Values (Lusk & Briggeman, 2009). Furthermore, two  
228 final sections are devoted to socio-demographics and fish consumption habits information of each  
229 respondent completing the survey.

230 [INSERT TABLE 1 AROUND HERE]

### 231 3.2. Research hypothesis and data processing

232 The research starts from the formulation of the hypothesis that a positive message would increase  
233 consumer's attitudes towards the product. According to this reasoning, table 2 presents a first group of  
234 hypothesis that can be generalized as follows:

235 *[H1] The information increase consumers' positive attitudes towards the product, and the magnitude*  
236 *of the impact increase with the increase of information provided.*

237 A second hypothesis has been proposed on the moderating role of individuals' food technology  
238 neophobia on the effect of information on consumers' attitudes. This hypothesis is:

239 *[H2] The individual's FTNS index moderates the effect of the informative message in changing*  
240 *consumers' attitudes towards the product.*

241 [INSERT TABLE 2 AROUND HERE]

242 No hypothesis is formulated *a priori* on the different impact between different types of information  
243 provided in the case of *H1*, nor on the sign of the moderation effect of the FTNS scale on the effect of  
244 informative message in *H2*. According to the focus of the present study, authors did not articulate any

245 hypothesis on other consumers' demographics; rather, they are used as control variables in the  
246 estimation.

247 All data processing has been performed by using IBM SPSS software. In order to test *H1*, a generalized  
248 linear model (GLM) has been run for each attitude measurement considered. In addition to the  
249 information treatments, the individual's FTNS index, the demographics and the Food Values are used  
250 in the models. As described in the following paragraphs, the Food Values enter the estimation as  
251 individual factor scores of the two factors obtained by a principal component analysis (PCA) run on the  
252 scale. A part of testing *H1*, this step of the estimation explores the determinants of consumers' attitudes  
253 towards the innovative products. An analysis of the individual's FTNS moderating effect on the impact  
254 of information on consumers' attitudes follows the GLM estimation in order to test *H2*. In this step, the  
255 Model 1 of the PROCESS package (Hayes, 2012) has been used to calculate the significance and sign  
256 of the interaction of treatments and FTNS on attitudes.

## 257 **4. Results**

### 258 *4.1. Characteristics of the sample*

259 The final characteristics of the sample are shown in Table 3. It consists in 418 respondents aged  
260 between 18 and 81 years (Mean= 37.22; SD=12.91), 221 of whom are female, representing the 52.9%  
261 of the total. The family counts primarily 3-4 members (224; 53.6% of the total) with mainly with  
262 children between 13-18 years (48.3%). Approximately half of the respondents are resident in North of  
263 Italy, in Lombardy Region (208; 49.8%), the other half in South of Italy, in Apulia Region (210,  
264 50.2%). The vast majority of the sample has a monthly household's income of 4,000€ at maximum  
265 (336; 87.6%) and, finally, 216 respondents possess a Bachelor degree or higher (51.7% of the total).  
266 Compared to the Italian population, as for the majority of internet surveys, the education level does not  
267 reflect the distribution of the variable. Possibly due to self-selection and non-response bias, this

268 characteristic of the sample causes a decrease in term of expected generalization to the whole  
269 population (Hudson, Seah, Hite, & Haab, 2004; Schonlau, Van Soest, Kapteyn & Couper, 2009; and  
270 reproducibility of the results (Aarts *et al.*, 2015) On the other hand, as suggested in a study on fish  
271 perception (Gaviglio, Demartini, Mauracher, & Pirani, 2014), the use of control variables in the models  
272 helps in isolating the effect of the information treatment excluding accounting separately for the  
273 education characteristics of respondents. The descriptive statistics for all experimental groups and all  
274 the variables considered are gathered in the Appendix A.

275 [INSERT TABLE 3 AROUND HERE]

#### 276 4.2. Impact of information on consumers' attitudes towards the innovative product

277 The results of the estimation of the role of different informative messages on consumers' attitudes  
278 towards the innovative fish product are reported in table 4. Each item used for the evaluation of the  
279 SLE technology, the overall liking of the product and its characteristics enters one generalized linear  
280 model as dependent variable. According to the questionnaire's sections, the independent variables are  
281 presented in four blocks. The information treatments compose the first block of variables and are the  
282 fixed factors of the models. A second block of covariates gathers the individual FTNS score, the stated  
283 previous knowledge of the technology and the factor scores of the two components extracted by PCA  
284 analysis on the Food Values. The third and fourth groups of variables gather the socio-demographics  
285 characteristics or the respondents and their fish consumption and purchase habits respectively.

286 The results show that only a small fraction of hypothesis formulated in H1 can be accepted. In fact, all  
287 control variables considered, the information possesses an impact only on the measure of perceived  
288 'taste and smell' and 'naturalness'. Specifically, looking at the parameter estimates, the message  
289 provided increased the evaluation of "taste and smell" in the *Info\_Q* and *Info\_Q+Info\_W* groups, while  
290 *Info\_W* group's evaluation was the same of Control's one. With regard to the evaluation of naturalness,

291 the only group that shows a significant increase was the *Info\_Q+Info\_W*. Obviously, the rest *HIs* must  
292 be rejected. In fact, the informative messages did not affect the evaluation of the technology, the  
293 overall liking of the product and the perception of its ‘environmental friendliness’, ‘healthiness’, ‘easy  
294 of cooking’, ‘easy of storing’, nor ‘freshness’. These results indicate that the informative messages  
295 tested are just mildly effective in changing consumers’ attitudes. Furthermore, the fact that two of three  
296 significant effects are measured in the *Info\_Q+Info\_W* condition suggests that the effect may depend  
297 on quantity of information, rather than type of information provided.

298 [INSERT TABLE 4 AROUND HERE]

299 Interesting results are highlighted by the analysis of the other determinants of consumers’ attitudes  
300 considered in the model. Firstly, FTNS scale is always significantly and negatively linked to measures  
301 of attitudes. On the contrary, previous knowledge contributes negatively to the explanation of the  
302 perception of ‘environmental friendliness’ of the product. With regard to the role of antecedents of  
303 consumption on perception of the new product, we run a PCA analysis on the Food Values. According  
304 to the results of the analysis (see Appendix B for the extended description), the eleven items of this  
305 scale can be reduced to two components. The first extracted component represents the importance that  
306 consumers attach to the *Quality Cues* of products when they make their daily food purchase and is  
307 significantly and positively related to the perception of the advantages offered by the new technology,  
308 the overall liking of the product, the perception of taste and smell and healthiness of the fresh fillets.  
309 The same pattern is showed by the second components that represents the importance that consumers  
310 attach to the *Convenience Cues* of foods. Furthermore, this score is positively and significantly related  
311 to the perception of the environmental friendliness and the naturalness of the product.

312 A second remarkable trend is shown by the role of socio-demographic characteristics of respondents.  
313 Looking at Table 4, they show no relationships with any of the attitudinal measures studied, with the

314 exception of the Area of residence, which is significantly related to the overall liking of the technology  
315 showing differences between Northern Italian and Southern Italian consumers, being the first more  
316 positively disposed to the technology. Consumption habits show a similar fashion. They do not  
317 correlate clearly to consumers' attitudes towards the fresh fillets. The majority of the significant  
318 relationships are found in the evaluation of the environmental friendliness of the products, which is  
319 positively related to the purchase at traditional fish shops and consumption of frozen whole fish and  
320 negatively to the consumption of frozen fillets. Instead, the easy of cooking is negatively correlated to  
321 the consumption of frozen whole fish and positively correlated with the consumption of anchovies. The  
322 consumption of fresh whole fish negatively relates to the overall liking of the technology, while the  
323 consumption of fresh fillets positively relates to the expectations in terms of taste and smell and  
324 perception of naturalness of the products. Finally, the consumption of anchovies is positively related to  
325 the perception of healthiness of the product.

326 [INSERT TABLE 4 AROUND HERE]

327 *4.3. Moderating role of Food Technology Neophobia Scale on the impact of information on consumers'*  
328 *attitudes*

329 Considering the relevance of neophobia in food choices, a second hypothesis was formulated on its  
330 moderating role on information treatment. Building on the previous evidences, the moderation analysis  
331 has been performed exclusively on those attitudinal measures that was explicated by information  
332 treatment and FTNS scale, i.e. the perception of 'taste and smell' and 'naturalness'. The results of the  
333 test of *H2* are expressed in Table 5. The hypothesis must be rejected, because the interaction between  
334 the two independent variables is not significant. According to the statistical analysis, informative  
335 messages increase the attitudes and individual neophobia decrease the acceptance of the fresh fillets  
336 packaged with SLE technology, but there is no additive or subtractive action of FTNS on information

337 treatments. This trend is evident in Figure 2 and Figure 3; here the average measures of perception of  
338 ‘taste and smell’ and ‘naturalness’ in the four experimental groups are presented considering a median-  
339 split of the sample based on FTNS individual score. The growing shapes of the figures demonstrate that  
340 attitudes increase with messages, while the differences between ‘not neophobic’ and ‘neophobic’  
341 respondents represent graphically the relevance of FTNS with regard to consumers’ attitudes towards  
342 innovative products, at least in the present case study. The fact that in both graphs the ‘not neophobic’  
343 and ‘neophobic’ lines growth approximately in parallel shows that the interaction between the two  
344 terms is not to be considered significant.

345 [INSERT TABLE 5 AROUND HERE]

346 [INSERT FIGURE 2 AND FIGURE 3 AROUND HERE]

## 347 **5. Discussion and conclusions**

348 The present research advances the knowledge on the impact of informative messages on acceptance of  
349 new food technology by conducting an on-line survey in North and South of Italy. As a case study, the  
350 research used a shelf-life extension technology applied to a 400gr package of fresh seabream fillets.  
351 The paper discusses the test of two information treatments aimed at increasing consumers’ attitudes  
352 towards the product. The first treatment informs consumers that the shelf life extension does not affect  
353 the overall quality of the fish fillets, while the second informs that the new packaging technology helps  
354 in reducing food waste. As a second goal, the paper explores the moderating role of FTNS on the effect  
355 of information and the sociodemographic determinants of consumers liking of the examined product.  
356 By the authors’ interpretation, three main conclusions can be derived from the empirical results. First,  
357 an adequate quantity of information may positively shape consumers attitudes towards fish products  
358 packaged using new shelf-life extension technologies. On the other hand, this implies that the content



359 of information is not clearly relevant in influencing consumers. At least in the examined case, these  
360 findings suggest that a promoting campaign should provide many and varied information, rather than  
361 focusing on specific positive characteristics of the product. Second, the individual food technology  
362 neophobia has been found the most important barrier to novel product acceptance. However, FTNS  
363 does not interact with information messages. Thus, despite FTNS is a strong negative determinant of  
364 acceptance of innovative and sustainable packaging, this result suggests that, even if “informed”  
365 neophobic consumers might not like the product as not neophobic consumers, they are still receptive to  
366 information. Third, attitudinal antecedents of food choice, i.e. the Food Values (Lusk & Briggeman,  
367 2009) and partly socio-demographic and consumption habits, are determinants of acceptance of the  
368 innovative products. This evidence confirms that heterogeneity of consumers must be considered in  
369 order to design effective interventions and target relevant and/or sensible clusters.

370 These results are in line with the recent literature. Indeed, the majority of the studies demonstrates that  
371 information positively influences consumers’ perception of some technologies and characteristics of  
372 foods, but could be ineffective on other proposed innovations and products (Cardello, et al., 2007;  
373 Altintzoglou, Heide, Carlehög, 2014; Lee et al., 2016; Barsics *et al.*, 2017). Furthermore, the  
374 comparison with the literature on Italian consumption of fish (Cosmina, Demartini, Gaviglio,  
375 Mauracher, Prestamburgo & Trevisan, 2012) suggested that the attitudes towards fish species and types  
376 of preparation are strictly related to personal values and habits that generally have a tendency to be  
377 transmitted between generations and also to depend on sociodemographic factors (La Barbera,  
378 Verneau, Amato, & Grunert, 2018; Kraus, Annunziata, & Vecchio, 2017). These trends are also  
379 showed by most of the studies on food preferences (Fiore et al., 2017; Stranieri, Ricci, & Banterle,  
380 2017). When consumer select a food product chooses the product as a mix of tangible and intangible  
381 attributes also relying on personal background thus being influenced by many interacting factors  
382 (Antonazzo, Fiore, La Sala, Contò, 2014; Verneau, Caracciolo, Coppola, & Lombardi, 2014). Finally,

383 it is worth being noticed that food technology neophobia can also depend on personality trait of people  
384 and context. Indeed, some authors highlight the relationship among food technology neophobia,  
385 satisfaction with life, food-related life because technologies may be rejected outright, without regard to  
386 the product in which they are embodied (Schnettler, Crisóstomo, Sepúlveda, Mora, Lobos, Miranda, &  
387 Grunert, 2013). Building on these reasoning, marketing intervention and public campaign to sustain the  
388 introduction of new technologies, and increase the acceptance of novel foods must possesses the  
389 following characteristics: (a) being tailored on targeted customers; and, (b) being tailored on targeted  
390 characteristics of the products. In this sense, private companies and public bodies are encouraged to use  
391 a specific protocol to analyze the context, and design, test and revise their intervention before the  
392 launch. This might be an expensive procedure, nonetheless, it is known that the inclusion of the  
393 consumers in the innovations development process becomes crucial in order to minimize failure  
394 probabilities (Guinè, Ramalhosa, & Valente 2016), thus an intensive pre-test of information on a  
395 representative sample of consumers would increase the probabilities of success of intervention on the  
396 targeted population.

397

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534



535 **Tables and Figures**

536 **Table 1. Informative message and number of subjects per experimental group**

<i>Experimental group</i>		<i>Information treatment</i>	<i>Collected</i>		<i>Valid</i>	
			<i>n.</i>	<i>%</i>	<i>n.</i>	<i>%</i>
1	Control	No info	133	25.1	103	24.6
2	Info_Q	The interest in this technology is that it enables to lengthen the product's conservation with no loss in term of qualitative properties	139	26.2	111	26.6
3	Info_W	The interest in this technology is that it reduces product waste with a good impact in economic, environmental and social terms	128	24.2	97	23.2
4	Info_Q+Info_W	The interest in this technology is that it enables to lengthen the product's conservation with no loss in term of qualitative properties and reduce product waste with a good impact in economic, environmental and social terms	130	24.5	107	25.6
<b>Total</b>			<b>530</b>	<b>100.0</b>	<b>418</b>	<b>100.0</b>

537

538

539 **Table 2. Hypothesis on the effect of the informative message on the evaluation of the product on the**  
 540 **different dimensions considered**

	Control		Info_Q		Info_W		Info_Q+InfoW
Overall liking	Technology	<	Technology	=	Technology	<	Technology
	Product	<	Product	=	Product	<	Product
Attributes evaluation	Taste and smell	<	Taste and smell	=	Taste and smell	<	Taste and smell
	Environment	<	Environment	=	Environment	<	Environment
	Health	<	Health	=	Health	<	Health
	Easy cooking	<	Easy cooking	=	Easy cooking	<	Easy cooking
	Easy storing	<	Easy storing	=	Easy storing	<	Easy storing
	Naturalness	<	Naturalness	=	Naturalness	<	Naturalness
	Freshness	<	Freshness	=	Freshness	<	Freshness

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544 **Table 3. Characteristics of the sample**

	<i>n.</i>	<i>%</i>		<i>n.</i>	<i>%</i>
	<b>Age</b>		<b>Household income (€ per month)</b>		
18-25 years	95	0,23	< 1.000	60	0,14
26-35 years	117	0,28	1.000-2.000	143	0,34
36-45 years	87	0,21	2.001-4.000	163	0,39
46-55 years	79	0,19	4.001-6.000	29	0,07
over 56 years	40	0,10	> 6.000	23	0,06
	<b>Gender</b>		<b>Household size (number)</b>		
Male	197	0,47	1	46	0,11
Female	221	0,53	2	90	0,22
	<b>Education</b>		3	95	0,23
First and secondary school	20	0,05	4	129	0,31
High school	182	0,44	5+	58	0,14
Bachelor degree	46	0,11	<b>Children in the household 0–12 years</b>		
Master Degree or higher	170	0,41	No	309	0,74
	<b>Residence Region</b>		Yes	109	0,26
North of Italy - Lombardy	208	0,50	<b>Children in the household 13–18 years</b>		
South of Italy - Puglia	210	0,50	No	216	0,52
			Yes	202	0,48
<i>Number of subjects in the survey= 418</i>					

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546

1 **Table 4. Explanatory variables for evaluation of the product in generalized linear models**

	Overall liking				Attributes evaluation													
	Technology		Product		Taste and smell		Environment		Health		Easy cooking		Easy storing		Naturalness		Freshness	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
<i>Information treatment</i>																		
Info_Q+Info_W	0.177	0.440	0.126	0.469	0.581	<b>0.002</b>	0.343	0.106	0.368	0.070	0.339	0.100	0.356	0.115	0.474	<b>0.039</b>	0.450	0.077
Info_W	-0.295	0.210	-0.093	0.604	0.377	<b>0.046</b>	0.261	0.232	0.066	0.750	0.075	0.723	-0.007	0.976	0.401	0.089	0.046	0.859
Info_Q	0.006	0.978	-0.081	0.642	0.391	<b>0.033</b>	-0.099	0.638	0.318	0.115	0.125	0.544	0.162	0.472	0.251	0.271	0.193	0.446
Control	0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>	
FTNS	-0.437	<b>0.000</b>	-0.538	<b>0.000</b>	-0.334	<b>0.000</b>	-0.406	<b>0.000</b>	-0.539	<b>0.000</b>	-0.294	<b>0.001</b>	-0.283	<b>0.004</b>	-0.538	<b>0.000</b>	-0.491	<b>0.000</b>
Knowledge of techs	-0.055	0.296	-0.009	0.830	-0.043	0.312	-0.116	<b>0.017</b>	-0.078	0.095	-0.063	0.185	-0.061	0.240	-0.043	0.412	-0.026	0.651
FV 1 - Quality Cues	0.186	<b>0.027</b>	0.267	<b>0.000</b>	0.157	<b>0.020</b>	-0.004	0.961	0.201	<b>0.007</b>	0.118	0.121	0.139	0.095	0.007	0.937	0.096	0.303
FV 2 - Convenience Cues	0.263	<b>0.003</b>	0.468	<b>0.000</b>	0.288	<b>0.000</b>	0.300	<b>0.000</b>	0.220	<b>0.005</b>	0.052	0.513	0.126	0.151	0.186	<b>0.036</b>	0.038	0.705
<i>Children max 12 yrs old</i>																		
No	-0.008	0.966	-0.046	0.751	0.001	0.996	0.148	0.401	0.060	0.723	0.174	0.309	0.228	0.223	-0.041	0.831	-0.148	0.482
Yes	0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>	
<i>Children max 13-18 yrs</i>																		
No	-0.138	0.428	0.022	0.870	-0.127	0.366	-0.156	0.336	-0.058	0.707	-0.330	<b>0.036</b>	-0.259	0.133	-0.080	0.648	-0.077	0.690
Yes	0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>	
<i>Area of Residence</i>																		
North Italy - Lombardy	2.508	<b>0.000</b>	-0.087	0.558	0.021	0.894	0.254	0.157	0.101	0.556	0.040	0.818	0.084	0.662	-0.100	0.604	-0.340	0.114
South Italy - Puglia	0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>	
<i>Gender</i>																		
Male	0.156	0.359	-0.019	0.883	-0.191	0.162	-0.155	0.328	-0.017	0.911	-0.134	0.383	0.082	0.625	0.062	0.717	-0.270	0.153
Female	0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>		0 <sup>a</sup>	
<i>Education</i>																		
Monthly income	-0.003	0.973	-0.024	0.677	-0.069	0.267	-0.008	0.911	-0.037	0.587	-0.021	0.767	-0.037	0.626	-0.035	0.645	-0.046	0.589
	-0.004	0.965	-0.042	0.526	-0.042	0.545	-0.096	0.228	-0.037	0.632	0.004	0.958	-0.008	0.923	-0.074	0.391	-0.015	0.874
<i>Place of purchase for fish</i>																		
Fish Shop	-0.091	0.325	-0.002	0.978	0.084	0.256	0.181	<b>0.035</b>	-0.060	0.467	-0.044	0.599	-0.040	0.663	0.050	0.590	-0.013	0.902
Open air market	0.005	0.958	0.005	0.947	-0.048	0.531	-0.167	0.062	0.034	0.689	-0.003	0.972	0.109	0.251	-0.116	0.230	-0.180	0.093
Supermarket	0.145	0.107	0.085	0.216	0.003	0.968	0.067	0.420	0.001	0.987	0.063	0.437	-0.020	0.826	0.005	0.958	-0.128	0.201
<i>Consumption of fish</i>																		
Fresh Whole Fish	-0.214	<b>0.020</b>	-0.074	0.295	-0.069	0.351	-0.062	0.469	-0.092	0.262	-0.040	0.629	-0.081	0.375	-0.096	0.298	-0.168	0.102
Fresh Fish Fillets	0.164	0.065	-0.019	0.781	0.181	<b>0.011</b>	0.091	0.271	0.097	0.220	0.056	0.489	0.171	0.052	0.241	<b>0.007</b>	0.134	0.176
Fresh Fish Recipes	-0.134	0.142	-0.011	0.869	-0.107	0.146	0.079	0.350	0.050	0.541	0.081	0.325	0.089	0.324	0.019	0.837	0.037	0.714
Frozen Whole Fish	-0.072	0.461	0.015	0.839	0.120	0.127	0.193	<b>0.033</b>	0.077	0.371	-0.173	<b>0.050</b>	-0.165	0.088	0.115	0.240	0.116	0.284
Frozen Fish Fillets	0.011	0.914	0.002	0.973	-0.027	0.734	-0.207	<b>0.022</b>	-0.039	0.650	0.148	0.094	0.131	0.176	0.009	0.923	-0.098	0.366
Frozen Fish Recipes	0.004	0.969	0.141	0.053	0.076	0.324	0.056	0.530	0.063	0.457	0.081	0.351	-0.028	0.771	-0.012	0.902	0.115	0.279
<i>Appreciation offish</i>																		
Sea bream. sea bass	0.041	0.448	0.054	0.197	0.052	0.235	0.009	0.862	0.030	0.536	-0.035	0.475	0.031	0.569	-0.002	0.976	0.068	0.265
Anchovy. sardine. mackerel	0.067	0.112	0.043	0.180	0.030	0.371	0.032	0.408	0.080	<b>0.033</b>	0.088	<b>0.021</b>	0.047	0.259	0.033	0.430	0.091	0.053
Codfish	-0.069	0.202	-0.051	0.211	-0.007	0.867	-0.044	0.380	0.024	0.608	0.054	0.261	0.057	0.287	-0.022	0.689	-0.019	0.749
Salmon	0.074	0.158	0.096	<b>0.017</b>	0.019	0.657	0.073	0.133	0.028	0.550	-0.012	0.808	-0.067	0.196	0.054	0.307	0.109	0.063
Trout	0.010	0.818	-0.006	0.849	0.023	0.521	0.033	0.422	-0.028	0.486	-0.013	0.756	-0.001	0.973	0.061	0.174	-0.018	0.718
Intercept	6.817	<b>0.000</b>	5.909	<b>0.000</b>	4.995	<b>0.000</b>	5.701	<b>0.000</b>	6.202	<b>0.000</b>	5.984	<b>0.000</b>	6.051	<b>0.000</b>	5.679	<b>0.000</b>	5.493	<b>0.000</b>

2 Note: bold format emphasizes the significant variables at 0.050. a. This parameter is set to zero because it is redundant.

3

1 **Table 5. Results of the moderation analysis of the role of food technology neophobia scale on the**  
 2 **impact of the information treatment on consumers' attitudes**

	<i>Info treatment</i>		<i>Food technologies neophobia scale (FTN)</i>		<i>Info*FTN</i>	
	<i>t</i>	<i>Sig.</i>	<i>t</i>	<i>Sig.</i>	<i>t</i>	<i>Sig.</i>
Taste and smell	3.134	<b>0.002</b>	-4.939	<b>0.000</b>	0.110	0.913
Naturalness	2.154	<b>0.032</b>	-6.433	<b>0.000</b>	-0.286	0.775

3

4

1 **Figure 1. Picture of the fish product used in the study**



2

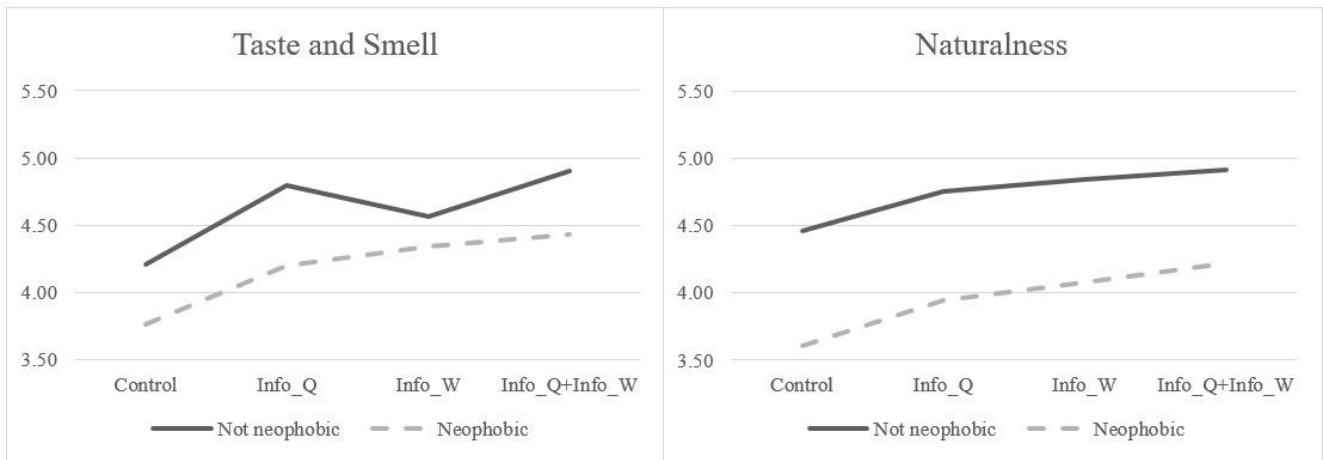
3 Note: the claim in the green label says “New Package – Fresh fish for 10 days more”; the claim in the light-blue label says:

4 “Tender and delicate – Sea bream fillets”

5

6

1 **Figure 2 and Figure 3. Mean of the evaluation of Taste and Smell, and Naturalness depending on**  
2 **informative treatment and neophobia**



3

4

# 1 Appendix A – Descriptive statistics of the four experimental groups

## 2 Table A1. Characteristics of each experimental group

Variables	Experimntal Groups				Total sample
	Control	Info Q	Info W	Info Q+Info W	
Overall liking - <i>Average</i>					
Technology	6.52	6.61	6.26	6.66	6.51
Product	4.45	4.51	4.45	4.70	4.53
Attributes evaluation - <i>Average</i>					
Taste and smell	3.99	4.52	4.44	4.70	4.41
Environment	4.48	4.50	4.80	4.92	4.67
Health	4.48	4.90	4.61	4.91	4.72
Easy cooking	5.22	5.32	5.33	5.55	5.36
Easy storing	5.30	5.46	5.33	5.64	5.43
Naturalness	4.04	4.38	4.42	4.62	4.36
Freshness	3.50	3.83	3.53	4.07	3.73
New food technologies neophobia scale - <i>Average</i>	3.58	3.52	3.24	3.64	3.50
Previous knowledge of packaging techs - <i>Average</i>	3.96	3.84	3.97	3.83	3.90
FV 1 - Quality Cues - <i>Average</i>	0.01	-0.07	0.08	-0.02	0.00
FV 2 - Convenience Cues - <i>Average</i>	-0.08	0.07	-0.01	0.02	0.00
Children max 12 yrs old in household - <i>Count</i>					
No	77	77	76	79	309
Yes	25	34	20	27	106
Children max 13-18 yrs old in household - <i>Count</i>					
No	77	77	76	79	309
Yes	25	34	20	27	106
Area of Residence - <i>Count</i>					
North Italy - Lombardy	53	56	49	50	208
South Italy - Puglia	50	55	48	57	210
Gender - <i>Count</i>					
Male	54	49	45	49	197
Female	49	62	52	58	221
Education - <i>Average</i>	3.99	3.94	3.94	3.94	3.95
Monthly income per household - <i>Average</i>	2.53	2.59	2.39	2.66	2.55
Typical place of purchase for fish product - <i>Average</i>					
Fish Shop	2.03	2.06	2.05	2.12	2.07
Open air market	1.58	1.61	1.71	1.48	1.60
Supermarket	2.73	2.73	2.97	2.73	2.79
Level of consumption different fish products - <i>Average</i>					
Fresh Whole Fish	2.34	2.40	2.56	2.40	2.42
Fresh Fish Fillets	2.31	2.41	2.26	2.43	2.35
Fresh Fish Recipes such as Sushi. Breaded. Spiced	1.93	1.71	1.81	1.74	1.80
Frozen Whole Fish	1.73	1.71	1.73	1.80	1.74
Frozen Fish Fillets	2.14	1.92	2.09	2.13	2.07
Frozen Fish Recipes such as Sushi. Breaded. Spiced	1.87	1.86	1.84	1.83	1.85
Appreciation of different species of fish - <i>Average</i>					
Sea bream and sea bass	5.42	5.78	5.94	5.57	5.68
Anchovy, sardine and mackerel	4.43	4.59	4.52	4.14	4.42
Codfish	4.91	5.02	5.12	4.91	4.99
Salmon	5.45	5.51	5.56	5.61	5.53
Trout	4.19	4.06	4.11	3.83	4.05

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5

1 **Appendix B - Results of Principal Components analysis on Food Values items**

2 To estimate the antecedents of food consumption we used the factor scores of a Principal Component  
3 Analysis performed on the Food Values (Lusk & Briggeman, 2009) per each respondent. The  
4 suitability of the data for the PCA was evaluated using the Kaiser–Meyer–Olkin measure and the  
5 Bartlett’s test of sphericity. The Table A1 shows the results of these tests. The KMO results equal to  
6 0.910, proving the sampling adequacy of the variables (Cerny & Kaiser, 1977) and the Bartlett’s test of  
7 sphericity is significant at <0.000 demonstrating that the variables considered are highly correlated  
8 (Dziuban & Shirkey, 1974) and appropriate for the analysis. Given these results, we thus performed the  
9 PCA using a varimax rotation algorithm. The analysis shows that two eigenvalues of the eleven  
10 components extracted exceed one, suggesting the presence of two factors that explain the 59.63% of  
11 the variance (Table A2). Finally, the rotated matrix of factor loadings can be used to characterize these  
12 two components. As showed in Table A3, the rotated solution shows that the first component is  
13 characterized by five variables (FV01- FV06 - FV07 - FV08 - FV09) that relates to the intrinsic quality  
14 of the product, while the second component is characterized by three variables (FV03- FV05 – FV10)  
15 that relates to the convenience attributes of the product. We thus called the two factors *Quality Cues*  
16 and *Convenience Cues* respectively indicating that the higher is the factor score the higher is the  
17 importance attached by the respondents to the *Quality* or *Convenience* cues perceived in the food  
18 product.

19 **Table B1. KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.910
	Approx. Chi-Square	2,023.72
Bartlett's Test of Sphericity	df	55
	Sig.	0.000

20



1 **Table B2. Total Variance Explained by Principal Components Analysis**

<i>Component</i>	<i>Initial Eigenvalues</i>			<i>Extraction Sums of Squared Loadings</i>		
	<i>Total</i>	<i>% of Variance</i>	<i>Cumulative %</i>	<i>Total</i>	<i>% of Variance</i>	<i>Cumulative %</i>
1	5.19	47.21	47.21	5.19	47.21	47.21
2	1.37	12.41	59.63	1.37	12.41	59.63
3	0.87	7.87	67.49			
4	0.61	5.51	73.00			
5	0.58	5.28	78.28			
6	0.57	5.19	83.47			
7	0.43	3.93	87.40			
8	0.41	3.71	91.11			
9	0.36	3.30	94.41			
10	0.34	3.05	97.45			
11	0.28	2.55	100.00			

2

3 **Table B3. Rotated Component Matrix**

	<i>Component</i>	
	<i>1- Quality Cues</i>	<i>2 - Convenience Cues</i>
FV01 - Naturalness	<b>0.781</b>	0.304
FV02 - Taste	0.570	0.540
FV03 - Price	0.172	<b>0.723</b>
FV04 - Safety	0.628	0.530
FV05 - Convenience	0.040	<b>0.733</b>
FV06 - Nutrition	<b>0.690</b>	0.271
FV07 - Tradition	<b>0.720</b>	0.137
FV08 - Origin	<b>0.777</b>	0.252
FV09 - Fairness	<b>0.661</b>	-0.084
FV10 - Appearance	0.198	<b>0.775</b>
FV11 - Environment	<b>0.773</b>	0.191

4 Note: Based on responses on 7-point Likert scale to the answer "How important are to the following characteristics of a  
 5 food when making your diet choices?" - from 1: Not important at all, to 7: Absolutely Essential