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Consumers' perceptions of food risks: A snapshot of the Italian Triveneto area

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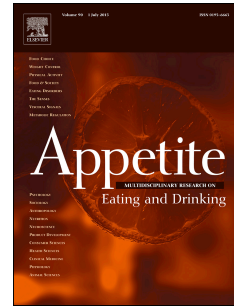
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1 Consumers' perceptions of food risks: A snapshot of the Italian Triveneto area

4 Abstract

5 This study investigated the food risk perceptions of people living in the Triveneto area
6 (Northeast Italy), a territory characterized by a particular interest in the production of quality
7 foodstuffs, to determine what aspects people associate with food risk and to understand what beliefs
8 underlie these perceptions.

9 Four focus groups were conducted in the major towns of the target area ($N = 45$). A semi-structured
10 interview was used that focused on beliefs about food risks, the use of information and media
11 sources in relation to food risk, and the behaviours adopted when eating outside the home.

12 A homogeneous view of food risk emerged among the respondents, and a common definition of
13 risky food was identified. The concept of risk was in opposition to the quality and controllability of
14 food, which emerged as major strategies to cope with food risks. Quality was linked to freshness
15 and local origin, whereas controllability reflected a direct (e.g., checking labels, having a
16 relationship with the vendor, cultivating one's own vegetable garden) or indirect (e.g., control
17 guarantees provided by suppliers and the government) means to check the safety and quality of
18 food. Although people seemed quite informed about food risks, a common sense of impotence with
19 regard to one's own protection prevailed, together with a fatalistic sense of incomplete control over
20 risk.

21 The results identified food concerns for consumers living in this specific territory and might
22 represent a starting point for public health authorities to increase compliance with responsible
23 behaviours for risk mitigation and to define successful food policies for this area.

24
25 **Keywords:** risk perception; food risk; food quality; focus groups; risk communication; public
26 knowledge

28 1. Introduction

29 Promoting public health and food safety requires not only full commitment and attention to
30 activities related to infectious disease control and risk evaluation and management but also listening
31 and communicating with citizens (Wilcock, Pun, Khanona, & Aung, 2004) as part of a wider risk
32 governance strategy (Dreyer & Renn, 2014).

33 It is widely recognized that concerns about food safety have increased in the last decade, together
34 with recurrent demands for transparency and information (Grunert, 2002; Papadopoulos et al.,
35 2012). In particular, rapid changes to the agro-food system, new or changed lifestyles for many

36 groups of people and repeated occurrences of food crises (e.g., avian influenza, *E.coli* epidemics,
37 BSE) have deeply affected the relationships between consumers and food and between consumers
38 and the public health agencies that are delegated with guaranteeing food safety (Cope et al., 2010;
39 Holm & Kildevang, 1996; Kjaernes, Harvey & Warde, 2007; Scholliers, 2008).

40 In response, national and international organizations have launched a variety of public initiatives
41 and communication campaigns to provide adequate answers for consumers and to encourage
42 responsible food habits and behaviours to reduce unjustified alarmism and provide consumers with
43 concrete risk mitigation strategies (Infanti et al., 2013; Sixsmith, Doyle, D'Eath, Barry, 2014;
44 Tiozzo et al., 2011).

45 The effectiveness of food and health policies in terms of risk prevention is closely linked to the
46 success of these communication interventions (McCarthy & Brennan, 2009; van Dijk, Houghton,
47 van Kleef, van der Lans, Rowe, & Frewer, 2008). Therefore, to design tailored risk/benefit
48 communication campaigns, it is crucial to investigate how people perceive and manage food risks
49 (Honkanen & Frewer, 2009; McCarthy et al., 2007; Wilcock et al., 2004).

50

51 *1.1. Food risk perception and communication*

52 Food risks are of great concern for consumers, who face daily food choices and must cope
53 with possible hazards. Scholars use the term “food risks” to refer to hazards from food of
54 microbiological (e.g., foodborne diseases), chemical (e.g., pesticides and contaminants) or
55 nutritional (e.g., obesity and cardiovascular diseases) origin (Buzby, 2001). Both microbiological
56 and chemical risks derive from industrial production and domestic practices, such as agricultural
57 practices, the transport and processing of food, food storage and food consumption (Mol &
58 Bulkeley, 2002).

59 As noted by Miles et al. (2004), “associated attitudes towards a particular hazard are driven more by
60 psychologically determined risk perceptions than the technical risk estimates provided by experts”
61 (p. 9). Public concern about food-related risks is mainly associated with chemicals, pesticides and
62 other substances (European Commission, 2010), whereas experts judge microbiological hazards to
63 be the main risk to health from food (Miles et al., 2004). Moreover, experts estimate that there is
64 still a considerable burden of foodborne illness (Havelaar et al., 2010). In recent years,
65 microbiological contaminations and foodborne infections (e.g. *salmonellosis*, *campylobacteriosis*)
66 have increased significantly (Brennan, Mc Carthy & Ritson, 2007; EFSA-ECDC, 2015; Redmond
67 & Griffith, 2003). These infections are mainly acquired through the ingestion of contaminated food
68 of animal origin, direct contact with infected animals, cross-contamination, environmental sources
69 or person-to-person transmission (Losasso et al., 2012).

70 A number of studies have highlighted the diffusion of food pathogens in foodstuffs prepared at
71 home (Byrd-Bredbenner, Scaffner & Maurer Abbot, 2010; Milton & Mullan, 2010; Redmond &
72 Griffith, 2003). Particularly in the domestic environment, incorrect beliefs about food storage,
73 handling and preparation can expose consumers to the risk of foodborne diseases (Mari, Tiozzo,
74 Capozza & Ravarotto, 2012; Taché & Carpentier, 2014). However, safety measures taken by
75 consumers have been shown to play a critical role in the prevention of foodborne infections.
76 Therefore, the dissemination of tailored communication materials is crucial to improve food safety
77 management at home. To succeed in increasing knowledge about correct food-handling practices,
78 communication materials should be designed according to the target's beliefs, perceptions and
79 attitudes about these risks. In addition, the socio-cultural context and the geographic territory should
80 be regarded as factors that might influence personal strategies to mitigate risks (Lundgren, 1994;
81 Lupton, 2003). Approaches to food risk management that do not specifically consider public and
82 stakeholders' views have been shown to be inefficient in a number of high-profile cases (Shepherd,
83 2008).

84

85 *1.2. Food safety in Italy: the Triveneto area*

86 National food security policies must consider consumers' expectations and concerns about
87 how food is produced and processed as well as its origin and impact on the environment and society
88 (Brunori, Malandrin, & Rossi, 2013). A number of studies have demonstrated that differences in
89 food consumption are also related to territorial aspects (Pieniak, Verbeke, Vanhonacker, Guerrero
90 & Hersleth, 2009).

91 Italy has usually been portrayed as a country with a strong and internationally recognized food
92 culture, and the prominent role of the agro-food sector in the national economy and culture is well
93 acknowledged (Ferretti & Magaouda, 2006). As reported by Casini, Contini, Marone and Romano
94 (2013), any geographic area is generally characterized by different traditions and different lifestyles.
95 This is particularly true for the target territory of the current study, the Triveneto area¹. This area
96 has been renowned for its strong agricultural tradition, its wine and food sectors, and a substantial
97 production of typical foods (i.e., products with high cultural and gastronomic value produced
98 according to local and historical traditions) (Banca d'Italia, 2011; Banca d'Italia, 2015; Centro
99 Studi Unioncamere Friuli Venezia Giulia, 2015; Gallenti, 2014; Regione del Veneto, 2015).
100 Moreover, the Triveneto area is characterized by a growing interest in the sale and consumption of
101 traditional products, especially raw pork such as salami and 'sopresse', which are manufactured

¹ The Triveneto area refers to a geographic area situated in Northeast Italy. It is composed of the Veneto, Friuli Venezia Giulia and Trentino-Alto Adige (autonomous provinces of Trento and Bolzano) regions.

102 without starter cultures and ripened in a non-standardized environment. Because foodborne
103 outbreaks can be associated to the consumption of such foodstuffs, the local government has
104 recently implemented a simplified procedure to sell small quantities of those products directly from
105 the producer to the consumer (Roccatto et al., 2017). In this way, the safeguarding of both food
106 quality and the need for cultural identity (Demos & Pi, 2009) are combined with respect to food
107 safety standards (De Cesare, Mioni & Manfreda, 2007; Roccatto et al., 2015).

108 Despite the acknowledged quality of the local gastronomic products, Italians generally do not trust
109 the food they eat. A recent Italian survey (Accredia, 2013) found that 74% of the respondents were
110 concerned about food risks. In particular, respondents' feelings of anxiety and insecurity were
111 mainly due to the mass media's depictions of risky food. These data have also been confirmed at the
112 local level with specific reference to the Italian Triveneto area. In 2014, Demos and Pi found that
113 three out of four people (74%) living in this area were very or somewhat concerned about food
114 safety and food risks. In addition, the degree of this concern has increased in the last few years
115 compared to previous surveys (Demos & Pi, 2009).

116 Based on these considerations, it is important to gain deeper knowledge of how people
117 living in the Triveneto area cope with food risks and what characterizes their perceptions. To the
118 best of our knowledge, there is little literature on consumer perceptions of food risks in this area.
119 Arzenton, Neresini and Ravarotto (2005) conducted a preliminary analysis that aimed to identify the
120 most important factors that contribute to social perceptions of food risk for people living in the
121 Veneto region. The findings revealed that consumers living in the Veneto region seemed to have
122 adopted two specific strategies to restore trust in their food: purchases of local products and a
123 propensity towards natural foods that are self-cultivated.

124

125 *1.3.Aims of the study*

126 The present study aimed to investigate how people living in the Triveneto area perceive and
127 manage food-related risks to gain a deeper understanding of what they consider safe or risky
128 foodstuffs and what strategies they adopt to cope with these risks. By means of exploratory focus
129 groups, we investigated attitudes and beliefs towards food risks with reference to eating both at
130 home and outside the home. Consumers' opinions about the role of media sources in delivering
131 information about food risks were also explored to understand what information sources lay people
132 trust and use for their informational needs about food risks.

133 This research extended the exploratory study conducted in the Veneto region by Arzenton et
134 al. (2005) to the Friuli Venezia Giulia and Trentino-Alto Adige regions to obtain a snapshot of food
135 risk perceptions throughout the Triveneto area.

136 Because the institute that conducted the research is based in Triveneto and is mandated with
137 the task of protecting consumers' health by ensuring food safety, the results were intended to
138 provide local public health authorities with useful input to inform and plan food risk communication
139 and policies. This aim responds to the need to consider the actual concerns of the public because
140 societal priorities for risk mitigation activities may not align with those identified by expert groups
141 (Frewer, 2004).

142

143 **2. Method**

144 *2.1. Participants and procedure*

145 Given the study's purpose, a qualitative research approach was used that was based on focus
146 groups. This method is centred on group interaction. It encourages participants to respond to and
147 question one another under the supervision of a moderator (Greenbaum, 1998; Morgan & Krueger,
148 1993). The aim of this procedure is to reveal the opinions, attitudes, and experiences of the people
149 involved in the discussion. Focus groups are useful for assessing how opinions converge or diverge
150 within a particular group and the reasons why this is the case.

151 Four focus groups were conducted in 2008 in four different towns in the Triveneto area:
152 Bolzano and Trento (Trentino-Alto Adige Region) and Pordenone and Udine (Friuli Venezia Giulia
153 Region). These towns were selected because they are among the most important in the target
154 territory, and they host peripheral diagnostic laboratories of the research institution that supported
155 the study.

156 Trained personnel working at the research institution who commissioned the study recruited
157 participants on the basis of specific demographic variables: gender, age, level of education and
158 family composition. Most importantly, the personnel were asked not to involve relatives, friends or
159 expert people (e.g., people working in the field of food safety) to avoid significantly biasing the
160 discussion. Another selection criterion for participants was being the main person responsible for
161 food choices, purchases and preparation in their families because the eating habits of those who buy
162 and prepare food may influence the eating habits of the entire household (Furst, Connors, Bisogni,
163 Sobal, & Falk, 1996; Monsivais, Aggarwal & Drewnowski, 2014).

164 A total of 45 adults (10 males and 35 females) voluntarily took part in the focus groups. The sample
165 composition is detailed in Tables 1 to 4. Four different age classes were considered (under 30 years
166 old; 31-45; 46-59; 60 and over) to obtain views and reports rooted in different generational groups.
167 Elderly individuals were also enrolled, not only due to their active role in food purchasing and
168 preparation in developed countries but also for their major vulnerability to foodborne diseases and
169 nutrition-related health problems (Gettings & Kiernan, 2001; Havelaar et al., 2010; Losasso et al.,

170 2012). Participants with young or grown children were included as well (Table 3) because a family
171 context in which children are present has been found to determine food habits (Casini et al., 2013).
172 The participants were not known or well known to one another.

173 All the focus groups took place in the evening; the participants were informed about the scope of
174 the study and were asked to provide their written informed consent to participate and to be audio
175 and video recorded. No specific ethical approval was required because the study presented no more
176 than minimal risk of harm to the participants. The sessions lasted approximately 90 to 120 minutes,
177 including an introduction and an opportunity for the participants to ask questions at the end of the
178 discussion. A note-taker was also present during each focus group. The participants received a
179 recipe book as a reward for their cooperation.

180

181 *2.2. Interview guide*

182 We used an improved version of the semi-structured interview used by Arzenton et al.
183 (2005), which was developed in accordance with established guidelines (Krueger, 2000) and
184 following an in-depth review of the literature concerning food risk perceptions and communication
185 (Cope, Frewer, Renn & Dreyer, 2010; Parra, Kim, Shapiro, Gravani & Bradley, 2014; Shapiro,
186 Porticella, Jiang & Gravani, 2011; Tiozzo et al., 2011). The interview guide (see Appendix 1 for
187 details) contained a series of open-ended questions that covered the following topics:

- 188 1. General beliefs about food risks (risk meaning and coping strategies);
- 189 2. Criteria for purchasing safe food (purchases points and motivational choices);
- 190 3. Beliefs about eating outside the home (safer places and foods);
- 191 4. Seeking information about food risk (preferred information and suggestions).

192 The participants were then given the opportunity to provide final remarks.

193

194 *2.3. Data analysis*

195 All focus group discussions were subsequently integrally transcribed. The full transcripts
196 were used as an input for the application of inductive thematic analysis (Boyatzis, 1998; Braun &
197 Clarke, 2006), which involves searching a data set for repeated patterns of meaning. Thematic
198 analysis, as noted by Braun and Clarke (2006), is a method that presents several advantages: it is
199 very flexible, and it can highlight similarities and differences across the data set and lead to
200 unanticipated insights. Moreover, it is useful to summarize the key features of a large body of data
201 and to produce qualitative analyses suited to informing policy development. We followed all the
202 phases described by Braun and Clarke (2006): after transcription, we repeatedly read the text to
203 familiarize ourselves with it, and we created an initial coding system in a systematic fashion.

204 Subsequently, we looked for overarching themes. Our attention was focused towards a broader level
205 of analysis by sorting the different codes into potential themes and collating all the relevant data.
206 Finally, we reviewed and named the identified themes (see Table 5). The analysis was performed by
207 two scholars in the research group who consulted with a third scholar as an auditor during meetings
208 that allowed debate. The results are presented by reporting the recurrent themes that emerged and
209 following the thematic sessions of the interview guide.

210

211 **3. Results**

212 Table 5 presents the major findings that emerged from the focus group discussions. Each
213 topic of discussion has been divided into categories according to the main themes that arose from
214 the discussions.

215

216 *3.1. General beliefs about food risk*

217 Most of the participants responded similarly to the question that asked them to name specific risky
218 foods. The following specific categories were indicated:

- 219 - Fresh foods (i.e., those that can rapidly deteriorate), such as vegetables and fruits, and foods
220 that are cultivated or bred far from where they were produced, such as meat or fish;
- 221 - Eggs;
- 222 - Foods containing chemicals (preservatives, additives, antibiotics, animal hormones and food
223 colouring);
- 224 - Industrial sweet snacks;
- 225 - Fried foods;
- 226 - Frozen foods;
- 227 - Convenience foods (e.g., Russian salad);
- 228 - Foreign foodstuffs.

229 Discussions among the participants revealed that food risks are generally associated with
230 specific attributes of food that serve as quality warranties: freshness, naturalness and local
231 provenance. The expiry date and food conservation and manipulation were the topics that the
232 interviewees mainly associated with the concept of “food risk”. The participants had concerns
233 related to these aspects because in their opinion, expired, deteriorated or poorly preserved foods can
234 damage health.

235 The interviewees showed a preference for buying fresh foodstuffs, although fresh foodstuffs such as
236 meat, fish, and fruits and vegetables require major attention from consumers, especially with regard

237 to choosing the supplier. The respondents reported that the product origin was a key factor and that
238 they preferred Italian foods.

239

240 'I am careful and I always ensure that the food is Italian, where it is manufactured.
241 Offers obviously interest me. However, if it has been packed two days before, I do
242 not buy it for sure. Then, the colour, I pay attention to the colour of food. Finally,
243 I also consider the feeling that the food is conveying. After years of shopping, one
244 is surely able to tell whether the stuff is fresh' (woman, 37 years).

245

246 Little attention was given by the participants to organic and genetically modified (GM) foods,
247 which occasionally were spontaneously mentioned by the interviewees. For these foods, the
248 interviewees' opinions were more varied and mostly divergent.

249

250 3.2. *Criteria for purchasing safe food*

251 The discussions revealed that people pay particular attention to the choice of the point of
252 purchase. On the one hand, purchasing at large retail chains is generally perceived to be safe
253 because of the numerous controls required by law with which retailers must abide.

254

255 'I am convinced that large retailers are more controlled because the employees are
256 diverse. Those who work as a butcher or who prepare food are not also the cashier
257 who is at the same time touching the money' (woman, 54 years).

258

259 On the other hand, the possibility of directly interacting with the dealer in case of dissatisfaction or
260 particular doubts about a foodstuff is of great help in choosing and buying foods that are perceived
261 to be safer and healthier. Indeed, whenever possible, people prefer to buy in smaller shops or to buy
262 directly from small producers, who can offer more safety guarantees and convey a sense of trust and
263 authenticity in the product in addition to reduced cost.

264

265 'I think that in a small retail store, one you trust, a certain amount of responsibility
266 can be found, whereas at a large supermarket, things are more depersonalized and
267 there are more products with a lower level of quality. Hardly ever can you
268 question the vendor about the quality of a foodstuff at a large retail store. On the
269 contrary, you can do that at a small retail shop' (man, 44 years).

270

271 Meat is purchased both at the supermarket and at butchers' shops, whereas fish is mainly purchased
272 at local markets. People buy and consume both red and white meat, whereas purchases of fish are
273 less diversified. Large-size fish, farm animals and fish slices are generally avoided as they are
274 considered the most dangerous. Fruits and vegetables are preferably bought from a farmer or at the
275 grocery store and only in season.

276

277 'There are small farmers who sell the products grown in their fields. I trust them
278 because I think that they do not even know what pesticides are. In fact, it is not so
279 much beautiful stuff, the food they sell' (woman, 56 years).

280
281 However, the interviewees stated that their choice of foodstuffs and the point of purchase largely
282 depended on the amount of time that they had at their disposal. As the time devoted to food
283 purchases has decreased, people (especially those who work) often tend to opt for frozen products,
284 notwithstanding their low level of confidence in them, as a temporary solution linked to the comfort
285 and speed of preparation of such foods.

286 The focus groups also revealed that many people have the opportunity to grow their own vegetable
287 gardens and consume this produce. The interviewees generally agreed that home-cultivated
288 products are perceived to be safer as their growth is entirely managed by the interviewees
289 themselves or other family members who are directly responsible for their quality and safety.

290
291 'My husband has been cultivating his own vegetable garden for three years, and
292 now I can tell the difference in the taste of the things you eat' (women, over 65
293 years old).

294
295 With regard to price, a correlation was perceived between high product cost and high quality. In
296 fact, the majority of the respondents declared that they preferred to buy products linked to well-
297 known brands that, although more expensive, are considered to be subject to more controls and thus
298 safer.

299
300 'It is better to try to spend a little more and buy a brand and, as a result, a quality
301 product. Maybe I am wrong, but I think [*brand name*] is more controlled. I prefer
302 drowning in rough seas and take the brand items; at least I know that they undergo
303 rigorous controls because these big companies cannot risk losing face in the
304 market, right?' (woman, 45 years).

305
306 Additionally, a non-varied diet, which is considered risky, could result when people spend little on
307 food.

308 309 *3.3. Beliefs about eating outside the home*

310 The participants were asked to report which foods they usually did not order when eating out and
311 why. The discussions mainly focused on eating out for business, leisure and when abroad. Hygiene
312 conditions were one of the criteria to which people referred when choosing where to go out to eat.

313 Overall, the participants noted that they paid particular attention to the consumption of foods
314 prepared by third parties. In particular, a negative perception of canteens emerged, with the
315 foremost concerns being poor hygiene conditions and the supply of leftovers:

316

317 ‘[Canteens offer] either leftovers or recycled foodstuffs. A breaded steak, do you
318 believe that it is done with the bread you buy or ground bread?’ (man, 63 years).

319

320 On the contrary, greater confidence is attributed to school canteens. Because they are responsible
321 for serving food to children, these canteens offer foods based on specific diets that are prepared by
322 experts. Thus, school canteens are perceived to be more controlled and to have higher food safety
323 standards.

324

325 ‘I have direct experience with reference to school canteens. They are connected
326 with the local health service. It is the primary Bolzano hospital dietician who
327 personally composes the menu. One day there is one food, the second day is
328 different, and the menus roll week after week, then in a month you eat it all’
329 (woman, 44 years).

330

331 When eating out, foods that are generally avoided include raw fish, salads, raw vegetables and food
332 containing uncooked eggs. In addition, people generally prefer to consume lightly seasoned dishes
333 with few processed foods. These precautionary measures are also applied when eating abroad.
334 Finally, some reservations emerged with respect to the hygiene conditions in ethnic restaurants.

335

336

3.4. Seeking information about food risk

337 When asked to report which information sources the participants preferred when seeking
338 information about food safety, television was declared to be the most frequently used, followed by
339 sector magazines. The participants also stated that they asked experts, such as general practitioners
340 or doctors at family counselling, who were preferred over friends and word of mouth.

341 Most of the participants blamed the mass media, especially television newscasts, for consciously
342 amplifying risk situations related to food issues.

343

344 ‘[The mass media] inflate the news, create alarmism and then, after a while, no
345 one is talking about that anymore and everything goes away’ (woman, 26 years).

346

347 Many participants noted the mass media's ability to disseminate information with a strong
348 emotional impact that can negatively influence consumers' choices about the purchase and
349 consumption of specific food products. For example, with particular reference to the highly
350 pathogenic avian influenza outbreaks that were publicized in Italy shortly before the focus group
351 discussions took place, many people reported avoiding the consumption of chicken and a preference
352 for red meat. However, they resumed their old eating habits once the emergency had ended.

353 Finally, we found that to be considered reliable and trusted information sources, mass media need to
354 be impartial and more competent about food safety issues.

355 As an alternative to the mass communication channels, the respondents proposed that public health
356 agencies could set up working groups to involve consumers in the management of food risks in an
357 attempt to provide as much information as possible to increase their knowledge. Alternatively,
358 training courses targeting students could be organized. The participants affirmed that beginning in
359 childhood, appropriate education should be provided about recognizing and preventing food risks.

360 In addition to these communication channels, the consumers stated that they usually referred
361 to food labels to obtain information about food safety. Most participants stated that reading the label
362 was a habit they usually performed during food purchases. In particular, the expiry date was the
363 information to which consumers paid the most attention among the information reported on food
364 labels. At the same time, people also stated that they searched the label information for the
365 product's origin before buying a product. Italian and local foods were preferred and trusted by the
366 interviewees, whereas foreign foods aroused greater suspicion. The food ingredients were another
367 important piece of information sought by consumers, particularly to check for the presence of food
368 colouring, additives, flavours and additional sugars.

369

370 'For example, I buy dark chocolate and look at the amount of cocoa, the
371 percentage of butter, sugar. The same thing for jam. If I buy a quality jam, I want
372 to see the ingredients: how much sugar and fruit it contains, which other
373 sweeteners are used. The same thing applies to yogurt and juice. For all foods, I
374 try to see if it matches what I think I am buying' (woman, 56 years).

375

376 However, the interviewees also stressed that labels do not advise about the possible risks
377 associated with the consumption of the product itself, and understanding the labels often requires
378 prior knowledge about the meaning of the terminology and acronyms.

379

380

381 **4. Discussion**

382 The present study described the perceptions of food risks for people living in the Triveneto
383 area and identified what they think is dangerous for their health in terms of food consumption as
384 well as the individual strategies they use to protect themselves from food risks. The project
385 extended a similar research project that was conducted only in the Veneto Region, which is part of
386 the Triveneto area (Arzenton et al., 2005), the findings of which have been generally substantiated
387 by the present study.

388 Cumulatively, the analysis of the focus groups revealed a common view of food risk
389 perceptions among the people involved in the discussions, showing the existence of widespread
390 perceptions of food risks. Similar to Arzenton et al. (2005), these perceptions were considered to be

391 strongly rooted in the social context of the reference group and yielded a unique definition of what
392 people think about when they refer to food risks.

393 In the interviewees' opinion, food is safe when it is from one's personal vegetable garden or
394 animal breeding; when it is fresh and in season; when its quality can be directly or indirectly
395 controlled by the consumer; when it is not overly manipulated; and when its preparation is
396 associated with a high level of hygiene.

397 Food risk was mainly associated with microbiological contaminations and foodborne infections and
398 with the handling and consumption of eggs, meat and fresh products that expire in a short time.
399 Similar to previous studies (Bearth, Cousin, & Siegrist, 2014; Dickson-Spillmann, Siegrist, Keller,
400 & Wormuth, 2009; Dickson-Spillmann, Siegrist, & Keller, 2011), our interviewees expressed
401 concerns about chemicals in their diet (e.g., pesticides, animal hormones, antibiotics and food
402 additives) and declared that they were worried about potential, sometimes unknown, health
403 implications. The interviewees noted that food risks could also be associated with childhood obesity
404 and a lack of respect for nutritional aspects. Many participants reported paying significant attention
405 when they prepared food for their relatives, especially for children, and stated their intention to
406 consume healthy, fresh and homemade foods instead of industrial products. However, other
407 respondents stressed that food risk might result from a lack of food diversity, which can hinder the
408 adoption of a healthier and more varied diet.

409 These findings show that consumers are aware of food risk in all its different aspects, including
410 microbiological, chemical and nutritional aspects. In particular, major attention and coping
411 strategies are devoted to avoiding microbiological risk. In fact, although the great majority of Italian
412 consumers associate food risk with chemical products, pesticides and toxic substances (European
413 Commission, 2010), our results better reflect experts' concerns about food-related risk (Buzby,
414 2001) because interviewees were more concerned about the microbiological risks of food. Sparks
415 and Sheperd (1994) obtained similar results.

416 Notably, food risk perceptions emerged as a two-dimensional construct based on the
417 following dimensions:

- 418 - quality warranties;
- 419 - perceived level of food controllability.

420 These dimensions were found to characterize participants' perceptions and attitudes towards food
421 risk when eating both at home and outside the home and served as coping strategies, together with
422 the search for good hygiene conditions, especially outside the home.

423

424 *4.1. Quality warranties*

425 Quality has emerged as a decisive factor in defining whether a food poses a risk for health,
426 and a number of factors that affect the perceived quality of food have been identified. In particular,
427 the consumers realized that they had to actively search for safe food, which they referred to as a
428 preference for quality food (i.e., fresh products, such as meat, fish, fruits and vegetables) that are in
429 season and locally produced. This result confirms Van Rijswik and Frewer's evidence (2008),
430 which showed that food quality and food safety are overlapping concepts. Moreover, Dreyer and
431 Renn (2014) noted that attributes such as 'natural, authentic and traditional' have gained importance
432 across Europe as motives for consumer choices. With regard to Italy, Mascarello et al. (2014)
433 recently confirmed this assumption; when assessing food quality, Italian consumers consider the
434 most important aspects to be the product's sensory characteristics (taste, appearance and freshness
435 of the product). Green et al. (2005) similarly used focus groups to assess public understanding of
436 food risks in four European countries that included Italy. Italian consumers were found to be 'more
437 concerned with naturalness and taste, and in some locations had concerns about the
438 "industrialisation" of food production or specific issues of food adulteration' (p. 524). Halkier and
439 colleagues (2007) also found the Italian food consumer to be a quality-conscious consumer.

440 The quality of food was also associated with the perceived degree to which the food had been
441 handled by third parties along the food production chain. In this sense, the level of perceived
442 handling acts as another determinant of quality based on the following factors:

- 443 - the quantity of added substances (pesticides, antibiotics, preservatives, food colouring), i.e.
444 chemical risk;
- 445 - how much the foodstuff is perceived to differ from its proper characteristics (taste, colour),
446 i.e. microbiological risk;
- 447 - the length of the production chain, i.e., risks related to industrial food production.

448 These beliefs justify the general avoidance of frozen and gastronomic foods and ready-to-eat
449 products and are consistent with the general preference for consuming home-grown products or
450 products cultivated by a trusted person.

451 The food provenance was considered to be a determinant of food quality as well, as previously
452 shown by Feldmann and Hamm (2015) and Lobb and Mazzocchi (2007). In particular, the focus
453 group participants agreed that the farther away the source of the food is, the more it has been
454 significantly manufactured by many parties along the food chain. Therefore, the interviewees
455 expressed a preference for domestically produced food, whereas imported foods and ethnic or
456 industrial foodstuffs were associated with risk. These beliefs may be due to food neophobia (i.e., the
457 individual tendency to avoid consuming unfamiliar food, as explained by Fischer and Frewer
458 (2009)) or, more generally, to the sense of belonging to a specific territory that causes the

459 interviewees to prefer local food, or safer food, because of their social identity (Demos & Pi, 2009;
460 Pino, Amatulli, De Angelis & Peluso, 2016)).

461 It is reasonable to assume that a local product is considered safe when it is viewed as a familiar
462 product. The literature has found that familiarity may be a predictor of the perception of benefit
463 (Fischer & Frewer, 2009). Familiarity is also one of the most important drivers of a preference for
464 certain food products because it reduces product uncertainty (Borgogno, Favotto, Corazzin,
465 Cardello & Piasentier, 2015). Our results highlighted that typical and local foods are preferred when
466 eating outside the home and abroad as an individual strategy to reduce concerns associated with
467 globalization and the standardization of food consumption habits. However, if people had a positive
468 experience with the consumption of food abroad or the opportunity to check the food
469 manufacturing, they declared the consumption of these foreign foodstuffs to be equally acceptable.
470 This study found the dimension of control to be fundamental in defining food risk perceptions, as
471 will be discussed below.

472

473 *4.2. The perceived level of food controllability*

474 The focus group discussions highlighted the importance of the perceived level of
475 controllability in shaping consumers' perceptions and demonstrated the key role of this dimension
476 in reducing anxiety about food risks. Controllability was mainly associated with consumers' direct
477 control over the quality and safety of food. In particular, a preference for self-produced foodstuffs
478 (e.g., vegetables cultivated in one's own garden) and for local food emerged, which is in line with
479 Italians' overwhelming preference for traceable food produced according to local traditions and
480 culture (Pino et al., , 2016). This preference might reflect consumers' increased awareness of food
481 risks as well as people's choice to experience sustainable alternatives to the industrial production of
482 food. However, the choice to consume self-made foodstuffs, such as those produced in a short
483 supply chain (Verraes et al., 2015), can unwittingly expose consumers to foodborne pathogens that
484 they might be unaware of because of an optimism bias, as widely reported by the literature
485 (Millman, Rigby, Edward-Jones, Lighton & Jones, 2014). Reading food labels was found to be
486 another important form of direct control over food because it allows consumers to check the
487 ingredients and properties of the food they purchase.

488 In line with the previous literature (Dinga, Veemanb & Adamowicz, 2013; Siegrist &
489 Cvetkovich, 2000), when direct control cannot be exerted, a trustworthy relationship with vendors is
490 considered a good proxy for controllability. Choices related to the evaluation of food risks need to
491 be made more than once a day and might represent a highly time-consuming activity. Therefore,

492 people need to delegate control on some occasions and have other trusted figures act on their behalf,
493 as some interviewees stated.

494 The safety controls requested by law for public health agencies and certifying bodies offer
495 another source of indirect controllability. Interestingly, some interviewees declared a willingness to
496 delegate control over food quality and safety to suppliers and retailers because they believe that
497 food chain and manufacturing processes are highly controlled and require conformity with food
498 safety standards and laws. Indeed, previous studies have reported relatively high consumer
499 confidence and trust in the safety of the food supply chain (Barnett et al., 2016; Van Kleef et al.,
500 2007; Van Wezemaal, Verbeke, Kügler, & Scholderer, 2011).

501 Moreover, the participants identified both large and small retailers as safe sale points. This finding
502 may appear contradictory, but it is in line with consumer studies on food suggesting that such
503 contradictions can be reconciled if one considers that opposing practices highlight different
504 consumer strategies to address the complex context of food choices in consumers' daily lives
505 (Fischer, 2016). Contradictory practices might also derive from consumers' different levels of
506 knowledge and information exposure or availability. The present study is limited by omitting these
507 factors in the sample composition. Further research could verify this hypothesis.

508 Interestingly, the interviewees appeared to be supported by a high level of self-confidence in their
509 capability to recognize safe food. Their reported experiences and coping strategies of direct or
510 indirect control in choosing and buying food corroborate this hypothesis. The focus group
511 discussions revealed a tendency among consumers to underestimate the risks associated with the
512 domestic manipulation of food or with the consumption of food from a short supply chain. For
513 example, none of the interviewees specifically referred to dangerous practices adopted at home that
514 would be likely to damage their own or their family's health (see, for instance, Leikas, Lindeman,
515 Roininen, & Lähteenmäki, 2009). An optimistic bias can play a role as well; people tend to view
516 themselves as less vulnerable to food risks than other people and as less vulnerable than they
517 actually are (Sparks & Shepherd, 1994).

518 With regard to organic and GM foods, the opinions were quite controversial in terms of
519 controllability. Most people did not consider organic food a valuable alternative to traditional
520 products. Only a small number of the participants considered organic food safer or less treated and
521 believed that it had a higher quality standard. Rather, people showed a lack of confidence in these
522 foods because of unsafe treatments and the presence of air pollution, which affects organic and non-
523 organic products equally and makes them equally dangerous, in addition to their high cost. GM
524 foods were mainly associated with negative judgements, probably due to a lack of knowledge of
525 these products. The participants reported contradictory information and affirmed that they were not

526 aware of the consequences of consuming GM foods over a long period. Thus, the respondents
527 generally preferred to avoid buying these products. Both previous and more recent studies have
528 confirmed this finding regarding the consumption of GM foods in Italy (Harrison, Boccaletti,
529 House, 2004; Montuori, Triassi & Sarnacchiaro, 2012; Pino et al., 2016). These findings seem to
530 suggest that both of these types of food are still considered major concerns for consumers' health.
531 Therefore, future research is needed to help consumers resolve their uncertainty.

532

533 *4.3. Use of media outlets for food risk information*

534 Although the participants stated that they were not experienced with regard to food safety
535 topics, they appeared to be sufficiently informed and active seekers of this type of information,
536 especially during food emergencies. Their use of media outlets for food risk information resonates
537 with previous studies (European commission, 2010; Kornelis, de Jonge, Frewer & Dagevos, 2007).
538 However, respondents complained about the reliability and credibility of information sources that
539 were blamed for disseminating inaccurate and misleading information, exaggerating risks and
540 providing contradictory advice. Nevertheless, the participants stated they sought reassuring and
541 updated information from these sources. Indeed, media information on food safety is generally
542 highly distrusted compared to other sources, but at the same time, it remains a primary source for
543 many consumers (*manuscript in preparation*).

544 Importantly, the discussions revealed feelings of resignation and scepticism towards food risks and,
545 more generally, towards food safety management. Although the respondents seemed to be quite
546 informed about food risks, a fatalistic sense of incomplete control was predominant in response to
547 the lack of precise information on recognizing and preventing food risks. In their cross-cultural
548 study in Europe, van Kleef et al. (2006) also found that for consumers, responsibility for self-
549 protection was regarded as necessary because of scientific uncertainty and a lack of proper
550 information, among other reasons.

551 Finally, although food labels cannot be considered a proper communication channel like those
552 mentioned above, the participants reported using them to obtain information about the purchased
553 food. This reported behaviour is in line with previous research linking consumer label-reading
554 behaviour with the management of food risks (Tonkin, Coveney, Meyer, Wilson & Webb, 2016).

555

556 *4.4. Considerations for risk communication*

557 The ability to differentiate among perceptions of risks according to cultural belonging is a
558 fundamental part of the implementation of targeted and effective communication campaigns. The
559 literature has highlighted the need to analyse the reactions of individuals to risky situations, starting

560 from the cultural contexts and the communities to which they belong and in which they were raised
561 (Lupton, 2003). In this situation, the investigation of people living in a well-defined territory, such
562 as the Triveneto area, is crucial to discover which topics require deeper knowledge and
563 understanding by consumers to improve perceptions that may lead to more effective risk
564 communication.

565 First, local public health agencies mandated to ensure food safety should exert greater
566 efforts to inform consumers in response to the widespread feeling of impotence in properly
567 managing and avoiding food risks, as the focus group participants noted. For example, public health
568 actors might invest in delivering more detailed information to explain (i) who is responsible for
569 food safety and (ii) which actions are implemented at the food chain level and the governmental
570 level to ensure such controls on food.

571 Second, our findings suggest that more attention should be paid to increasing consumers'
572 awareness of possible food hazards related to the consumption of self-produced food and food
573 derived from a short supply chain in response to the judgements of optimism bias that emerged
574 from the discussions. This is a finding of major concern for experts, who generally consider self-
575 produced food and food from short supply chains to pose a greater risk to health than foodstuffs
576 from food industries (Roccatto et al., 2017). For instance, communication messages might persuade
577 consumers to responsibly adopt preventive behaviours when handling raw foods and to control the
578 safety of self-made food products before consumption. These communication messages might
579 suggest best practices for the transportation and storage of food to ensure its safety (e.g., do not eat
580 undercooked foods that could pose a risk, such as pork, chicken and shellfish; thaw meat in the
581 refrigerator and not at room temperature; and wash kitchen utensils between uses, especially if they
582 have been used to cut raw food). Educational materials and news in well-read magazines might
583 serve this purpose (see Tiozzo et al., 2011; Mari et al., 2012).

584 Our findings also suggest the need to develop concrete communication materials to resolve
585 concerns about chemicals in food, such as those suggested by Bearth et al. (2014). The importance
586 given by the participants to nutritional aspects as possible food risks may provide a stepping stone
587 for future research to investigate consumers' perceptions.

588 Communication interventions should also provide consumers with detailed and exhaustive
589 information on both organic and GM foods to increase their knowledge and to enable them to make
590 informed decisions regarding the consumption of these products. In particular, the interviewees
591 claimed that this information should be delivered by authoritative and impartial sources.

592 In addition, the focus group discussions illuminated the need for a greater commitment by the mass
593 media to ensure the dissemination of clear-headed and scientifically validated information. The

594 mass media should depict food risk news without provoking unjustified alarmism by being more
595 informative and reporting objective measures of risks (Benson, 2011; Tiozzo, Mantovani, Neresini
596 & Ravarotto, 2015).

597 Ultimately, this study confirms the key informative role of food labels (Dimara & Skuras, 2005)
598 and suggests that policy makers should adopt more comprehensible and exhaustive food labels.

599

600 4.5. Final remarks

601 Because the focus groups were exploratory and referred to a delimited socio-cultural context, the
602 results need to be interpreted with caution and cannot be applied *tout court* to a wider context.
603 Nonetheless, our findings are in line with previous international studies on food risk perceptions.
604 Similar to Holm and Kildevang's study (1996), our research showed that consumers combine
605 quality cues and make inferences when information is incomplete, suggesting that food choices
606 often reflect compromises in everyday life rather than consumers' preferences. Green et al. (2005)
607 showed that the public's understanding of food risks is multi-dimensional, rational and
608 sophisticated and that choosing safe foodstuffs is, to a certain extent, influenced by a sensible
609 pragmatism. Thus, consumers are given substantial responsibility with regard to choosing quality
610 and safe products for their own health as well as in complying with food hygiene standards when
611 they handle, cook and store food at home. Moreover, consumers in the focus group discussions
612 noted that they rely on personal knowledge as a successful strategy for risk avoidance. In this sense,
613 food risk communicators need to better hone communication interventions to increase consumers'
614 knowledge and strengthen the trust between consumers and institutions.

615 It is also worth noting that the focus group discussions were held shortly after some of the most
616 important food incidents that occurred in Europe (e.g., BSE, dioxin crisis) and in Italy (e.g., highly
617 pathogenic avian influenza), so the risk perceptions from these incidents and the impact of food
618 safety information had important effects on food consumption (Lobb, Mazzocchi, & Traill, 2006).
619 Therefore, our study might be considered a snapshot of the concerns of people who, to a certain
620 extent, have become familiar with food risks and with mitigation strategies to resolve uncertainties
621 about food safety and to make rational and responsible decisions in terms of food choice and
622 consumption.

623 The present study has one important limitation. A focus group is a research method that uses self-
624 reported information to provide a top-of-mind view of what people think about a specific theme.
625 The discussions might be biased by social desirability concerns linked to self-presentation
626 management (e.g. Marlowe & Crowne, 1960), which can make the interviewees talk and act as
627 informed and responsible consumers.

628 Additionally, the current research intended to provide insights about perceptions, beliefs and
629 attitudes for further quantitative research (e.g., survey) applied in a wider area and with a larger
630 sample. This type of research could also consider and measure social desirability bias. Furthermore,
631 a longitudinal research design could investigate the gap between attitudes and behaviours.

632 Focus group discussions revealed which topics generate major concerns in consumers. Additional
633 investigations could assess whether these concerns are specific to particular risks or could rank the
634 risks according to different levels of concern.

635 Ultimately, perceptions of food risk might be further investigated according to socio-demographic
636 variables, which was outside the scope of this article's initial premise.

637

638 **5. Conclusions**

639 Currently, safe food is at the centre of concern for governments, scientists and the public
640 (Scholliers, 2008). Communication research has stressed the importance of developing effective
641 risk communication processes as an integral part of risk assessment and management (Sheperd,
642 2008). In addition, previous research has noted that a national or regional strategy for food risk
643 communication is more desirable due to cross-cultural differences in consumer perceptions and
644 information preferences (Cope et al., 2010; see also Tiozzo et al., 2011).

645 Research on food risk perceptions is still sparse in Italy. Although the present study was conducted
646 in a limited socio-cultural territory, it can be considered a pilot study to increase attention to and
647 public debate on the importance of ensuring food safety through the promotion of tailored risk
648 communication interventions. In particular, communication messages should aim to raise
649 consumers' awareness about the adoption of adequate behaviours as normal daily practices when
650 preparing food at home and to promote risk mitigation strategies in response to the predominant
651 sense of impotence with regard to one's own protection. In this sense, our results represent a
652 starting point to inform food risk communication and policies for the territory under study.

653 Ultimately, our findings may provide useful insights to local food manufacturers and industries,
654 which may gain greater understanding of consumers' preferences and choices of food products at
655 different shopping places and consequently may improve food marketing strategies.

656

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662

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1 **Appendix 1. Interview guide used for the focus group discussions**

2

3 **1. General beliefs about food risk**

- 4 - Meaning and examples of risky/safe foods
5 - Personal strategies to cope with food risk

6

7 **2. Criteria for purchasing safe food**

- 8 - Preferred points of purchase
9 - Which motivations underlie the choice of food and the preference for certain points of
10 purchase

11

12 **3. Beliefs about eating outside home**

- 13 - Examples of safer places to go to eat
14 - Preferred foods

15

16 **4. Seeking information about food risk**

- 17 - Preferred information sources about food risk
18 - Suggestions to improve communication about food risk

19

20 **5. Conclusion**

- 21 - Final remarks
22 - Further insights and suggestions

23

24

1 Table 1. Distribution of the sample by gender and province of residence

2

<i>Province</i>	<i>Men</i>	<i>Women</i>	<i>Total</i>
Bolzano	3	8	11
Pordenone	1	10	11
Trento	4	9	13
Udine	2	8	10
<i>Total</i>	10	35	45

3

4

5

1 Table 2. Distribution of the sample by age and gender

2

<i>Age</i>	<i>Gender</i>		<i>Total</i>
	<i>Men</i>	<i>Women</i>	
21-30	0	6	6
31-40	3	3	6
41-50	3	8	11
51-60	1	5	6
Over 60	3	13	16
<i>Total</i>	10	35	45

3

4

1 Table 3. Distribution of the sample by presence of young or grown children in the family
2 composition

3
4

<i>Province</i>	<i>Participants with children < 12 years old</i>	<i>Participants with children > 12 years old</i>
Bolzano	5	4
Pordenone	5	7
Trento	4	7
Udine	2	7

5

1 Table 4. Distribution of the sample by level of education

2

3

<i>Province</i>	<i>Primary school</i>	<i>Middle school</i>	<i>High school</i>	<i>Degree</i>
Bolzano	0	1	5	5
Pordenone	0	3	5	3
Trento	0	3	5	5
Udine	3	2	4	1

4

1 **Table 5. Topics of discussion and categories that emerged from the focus group discussions**

2

<i>Topics of discussion</i>	<i>Categories</i>
<i>General beliefs about food risk</i>	<ul style="list-style-type: none"> - Identification of microbiological, chemical and nutritional aspects of food risk - List of risky foodstuffs - Identification of quality warranties (freshness, naturalness, local provenance) - Identification of risk factors (expiry date, food conservation and food manipulation) - Attitude towards GM and organic foods
<i>Criteria for purchasing safe food</i>	<ul style="list-style-type: none"> - Selection of the point of purchase according to the type of food - Role of (direct/indirect) control - Attention to the origin of the product - Role of time devoted to purchase food - Role of price and brands -
<i>Beliefs about eating outside the home</i>	<ul style="list-style-type: none"> - Eating out for business and leisure and eating abroad - Role of canteens - Definition of criteria to eat safely outside the home
<i>Preferred media outlet for food risk information</i>	<ul style="list-style-type: none"> - Use of mass media and food labels as information sources - Role of mass media in reporting risks - Informational needs about food risks

3

4