

AperTO - Archivio Istituzionale Open Access dell'Università di Torino

## Chocolate culture: Preferences, emotional implications and awareness of Italian consumers

**This is a pre print version of the following article:**

*Original Citation:*

*Availability:*

This version is available <http://hdl.handle.net/2318/1792482> since 2021-06-30T11:06:21Z

*Published version:*

DOI:10.1016/j.ijgfs.2021.100374

*Terms of use:*

Open Access

Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)

# Journal Pre-proof

Chocolate culture: Preferences, emotional implications and awareness of Italian consumers

Valentina Maria Merlino, Jatziri Mota-Gutierrez, Danielle Borra, Filippo Brun, Luca Cocolin, Simone Blanc, Stefano Massaglia

PII: S1878-450X(21)00073-1

DOI: <https://doi.org/10.1016/j.ijgfs.2021.100374>

Reference: IJGFS 100374



To appear in: *International Journal of Gastronomy and Food Science*

Received Date: 21 April 2021

Revised Date: 1 June 2021

Accepted Date: 8 June 2021

Please cite this article as: Merlino, V.M., Mota-Gutierrez, J., Borra, D., Brun, F., Cocolin, L., Blanc, S., Massaglia, S., Chocolate culture: Preferences, emotional implications and awareness of Italian consumers, *International Journal of Gastronomy and Food Science*, <https://doi.org/10.1016/j.ijgfs.2021.100374>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2021 Published by Elsevier B.V.

**Chocolate culture: Preferences, emotional implications and awareness of Italian consumers**

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13

Valentina Maria Merlino<sup>†</sup>, Jatziri Mota-Gutierrez<sup>†</sup>, Danielle Borra, Filippo Brun, Luca Cocolin, Simone Blanc\*, Stefano Massaglia

Department of Agricultural, Forest, and Food Sciences, University of Turin, Largo Paolo Braccini 2, 10095, Grugliasco, Turin, Italy

Valentina Maria Merlino, [valentina.merlino@unito.it](mailto:valentina.merlino@unito.it)

Jatziri Mota-Gutierrez, [jatziri.motagutierrez@unito.it](mailto:jatziri.motagutierrez@unito.it)

Danielle Borra, [danielle.borra@unito.it](mailto:danielle.borra@unito.it)

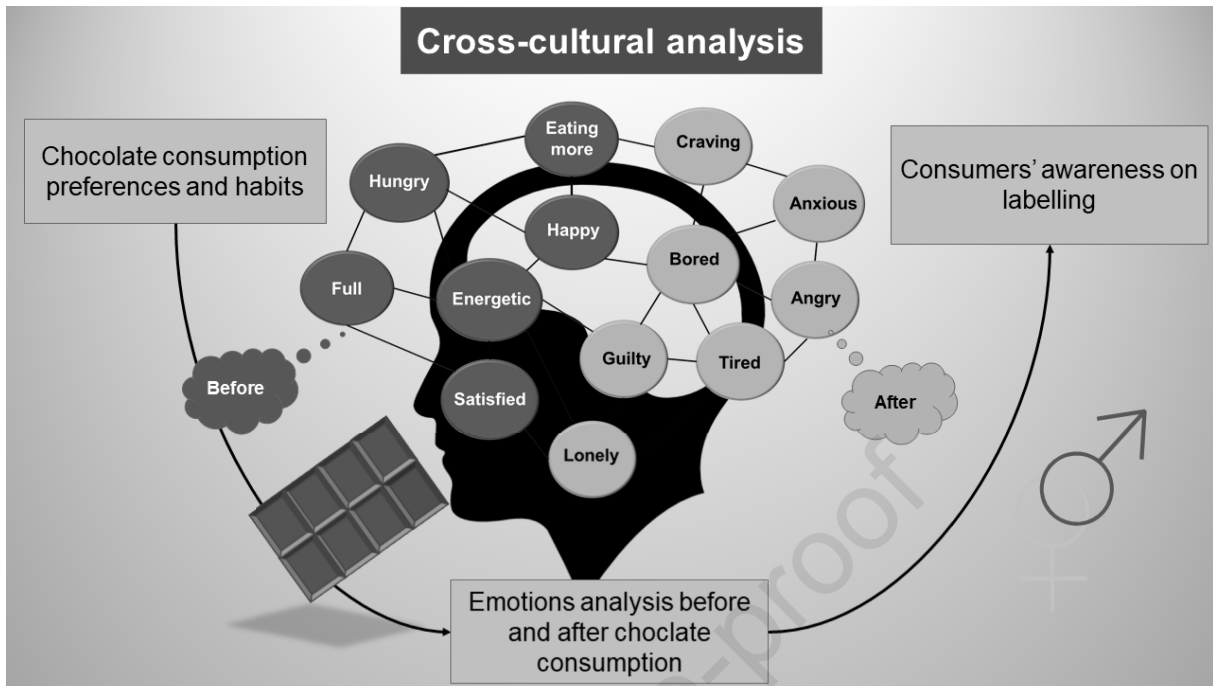
Filippo Brun, [filippo.brun@unito.it](mailto:filippo.brun@unito.it)

Luca Cocolin, [lucasimone.cocolin@unito.it](mailto:lucasimone.cocolin@unito.it)

Stefano Massaglia, [stefano.massaglia@unito.it](mailto:stefano.massaglia@unito.it)

<sup>†</sup>These authors contributed equally to this work

\*Corresponding author: [simone.blanc@unito.it](mailto:simone.blanc@unito.it)





## 6 Abstract

7 This paper analyses the preferences and emotional connotations of Italian consumers  
8 towards different chocolate types and assesses which label information consumers take into  
9 consideration during the purchasing process. A survey was conducted to collect data from 390  
10 respondents from two different Italian chocolate production regions (Sicily and Piedmont). The  
11 results show that overall, consumers prefer dark, extra-dark and milk chocolate. However, a  
12 significantly higher percentage of women and men from Piedmont prefer “Gianduia” (hazelnut-  
13 based chocolate), when compared to Sicilians, whereas the type of chocolate formats preferred  
14 by consumers differs by gender ( $P < 0.05$ ). Different attitudes before or after chocolate  
15 consumption are closely related to a certain type of product, in which gender and the  
16 geographical aspect are key influencing factors. Women and men from Piedmont feel unpleasant  
17 emotions towards chocolate before and after consumption, this was observed in the correlation  
18 analysis where positive correlations between anger emotions before consuming chocolate with  
19 guilty and sad emotions after consumption were noted in women and men, respectively ( $P <$   
20  $0.05$ ). In contrast, no significant correlations between feelings reported before and after  
21 chocolate consumption of Sicilian men was observed. During decision making, more than 40%  
22 of participants are aware of the cocoa quantity, nutritional information and fair-trade certification  
23 on the chocolate label. Our findings provide an empirical basis to inform the chocolate industry  
24 regarding consumer attitudes towards chocolate, to raise awareness of the social dimension in  
25 food labelling and to provide a baseline for the choice of a marketing communication strategy  
26 which plays upon emotional claims.

27           **Keywords:** dark chocolate, food choices, food labelling, emotions, feelings, consumer  
28 behaviour

29

## 30           **1. Introduction**

31           What people eat is enforced and formed based on their social and cultural environments  
32 (Cicia et al., 2012). Emotions and sensations are key drivers in food preferences, resulting in  
33 patterns of food choices within a cultural group (Codeluppi, 2003; Baptista et al., 2021). Several  
34 studies in psychology have defined the concepts of feeling (physical sensation) as "readings of  
35 the brain's recording of body conditions and changes" and emotions as "interpreted feelings"  
36 (Becker-Asano & Wachsmuth, 2009; Scherer, 2005). The differences between emotions and  
37 feelings correspond to the distinction between primary (or basic) and secondary emotions. Basic  
38 or primary emotions are universal, biologically based and shared by other primates (Ekman,  
39 1999; Leyens et al., 2001). Both positive (fun, surprise, satisfaction) and negative (fear, anger,  
40 disgust, sadness and contempt) emotions are classified as basic emotions and are interpreted as a  
41 cause or effect (Al-Thubaity et al., 2018; Ekman, 1999; Naik et al., 2020; Wood et al., 2018).  
42 Secondary emotions, such as shame, anxiety, loneliness, boredom and tiredness originate from  
43 the combination of primary emotions and develop during human growth and social interaction  
44 (Kempen et al., 2017; Plutchik, 1994). Happiness, a pleasant emotional state, is characterised by  
45 feelings of joy, gratification, satisfaction and well-being. In contrast, the negative emotion of  
46 sadness is characterised by feelings of disappointment, despair and disinterest. Thus, a positive  
47 emotion results in a positive feeling, just as a negative emotion is linked to a consequent negative  
48 feeling (Gruber and Moskowitz, 2014; Cherry, 2020).

49 Chocolate confectionary is one of the snack food products that uses emotional marketing  
50 communication (Gabrielli & Baghi, 2016; Liao et al., 2015). This type of communication  
51 strategy focuses on the generation of pleasant experiences at the moment of purchase, and before  
52 and after consumption (Zarantonello & Luomala, 2011). The consumption of chocolate has the  
53 capacity to (positively or negatively) modify consumer mental states by impacting their emotions  
54 and cognitive and sensorial responses (Maleki et al., 2020). Emotional eating is defined as eating  
55 in response to negative emotions (Steinsbekk et al., 2018; Sultson et al., 2017) and is often  
56 associated with emotional foodstuffs (such as chocolate). Emotional food is perceived as an  
57 escape from the experience of unpleasant emotions (Hussain et al., 2020). In the case of  
58 chocolate, eating this emotional food often results in the generation of a combination of both  
59 positive, yet also negative emotions (shame and guilt, mostly linked to weight gain) induced by  
60 moral transgressions (Alberts et al., 2012; Chen et al., 2007). In terms of the purchasing  
61 behaviour of chocolate, consumers are driven by feelings, even impulses (desire and stress)  
62 characterised by emotions such as fear, sadness and anxiety (Braden et al., 2018; Willem et al.,  
63 2020).

64 Food choices often occur impulsively, involving rapid, automatic, unconscious processes,  
65 typically towards savoury and fatty foods. However, present-day consumers also make more  
66 meditative and informed decisions based on reasoning, and take into consideration prior  
67 knowledge and long-term personal objectives (Kakoschke et al., 2014; Schumacher et al., 2016).  
68 The consumption of chocolate generates a state of pleasure of the person recreating a  
69 psychological feedback mechanism resulting in a positive feeling, which can even create  
70 addiction (Lake, 2015). The characteristics of the individual, mood, previous purchasing,  
71 motivation and consumption experiences are factors that influence chocolate consumption and



72 the emotions that result from it. Socio-demographic and lifestyle determinants have been shown  
73 to influence the motivations for choosing emotional foods, such as chocolate, and dietary  
74 patterns in general (Krieger et al., 2019; Petrenya et al., 2019).

75 The chocolate market in Europe is in constant growth, mainly due to the increasing  
76 demand for dark chocolate. Overall, the most highly consumed chocolate category in Italy is  
77 dark chocolate (42%), followed by, hazelnut chocolate (23%), chocolate with additional  
78 ingredients (16%), milk chocolate (15%) and white chocolate (4%) (Statista, 2020). The increase  
79 of dark chocolate consumption in recent years, in Italy, as in Europe, is due to the interest of  
80 individuals in healthier, but also sustainable and high-quality chocolate alternatives (i.e. certified  
81 products) (de Andrade Silva et al., 2017; Del Prete & Samoggia, 2020; Maleki et al., 2020).

82 Italy has a deep-rooted tradition of chocolate production. For the Piedmont and Sicilian  
83 regions, the manufacture of this confectionary snack product still represents a cornerstone of the  
84 entire sector at a national level. The production of chocolate in Piedmont began in 1678, but at  
85 the beginning of the nineteenth century, the chocolatiers were forced to replace cocoa with  
86 hazelnuts, because of the imposition of customs duties for imported goods, such as cocoa,  
87 established by the Napoleonic regime. Gianduia (hazelnut-based chocolate) is a well-known  
88 product throughout the world and it was created in the Piedmont region (Atlante del cibo, 2017;  
89 Magli & Nobolo, 2016). Unlike the Piedmont chocolate tradition, in Sicily, the production of  
90 chocolate is differentiated above all in terms of the flavours of the product, but not in the format  
91 that is typically the bar or "brick". Modica chocolate is produced in Sicily, and takes its  
92 namesake from the municipality of Modica. This chocolate is characterised by the presence of

93 sugar crystals and a gritty texture resulting from the manner of its production (Lanza et al.,  
94 2011).

95 The continuous differentiation on the market of several types of chocolate varieties  
96 results in quality discrimination among chocolate consumers. From the consumer perspective,  
97 Italian consumers are purchasing more chocolate made from cocoa beans, often sold at high  
98 prices, coming from a single-origin and granted with a Fairtrade and/or organic certification  
99 (MarketWatch, 2020; Pay, 2009). According to data from the Centre for the Promotion of  
100 Imports from developing countries, consumers purchase chocolate using as the main ingredient  
101 cultivated cocoa from the Dominican Republic and Ecuador (CBI, 2020). In addition to the  
102 preference towards dark chocolate from specific cocoa-producing countries around the world,  
103 consumers are also demanding chocolate with added flavonoids, gluten-free, vegan, products  
104 with lower sugar content and dark chocolate with added ingredients (AGR, 2020).

105 Consumer decision-making processes regarding food choices are deeply influenced by  
106 the information provided on the label. In regards to chocolate labelling, European legislation  
107 requires the chocolate industry to provide basic information, such as, the percentage of cocoa  
108 used to produce chocolate (no lower than 43%), manufacturer information (name and location of  
109 the producer or packager or seller of the product), list of ingredients, expiry date and weight of  
110 the product (Directive 2000/36/EC, introduced into Italian law by Legislative Decree 1  
111 178/2003). Other information often included on the packaging is voluntary and can be indicated  
112 when the contents of the main ingredients are increased compared to the mandatory recipe.

113 The present study aimed to investigate and compare the preferences, awareness and  
114 perception of the Italian consumer towards different types of chocolate, focusing on the

115 emotional connotations associated with chocolate choice and consumption, in addition to  
116 characterising these aspects in relation to geographical-demographic aspects. A consumer survey  
117 was performed in two Italian regions, Piedmont (North Italy) and Sicily (South Italy). These two  
118 regions are geographically located at the extremes of the country, characterised by different  
119 populations in terms of socio-demographic and lifestyle characteristics (ISTAT, 2020). However,  
120 both populations possess a deep-rooted and ancient tradition of chocolate making but are  
121 characterised by completely different productions (Giandua and Modica), which can provide us  
122 with interesting data reflecting general consumer preferences (Atlante del cibo, 2017; Lanza et  
123 al., 2011; Rebonato, 2020). Consumer motivations towards chocolate consumption are constantly  
124 evolving, thus it is imperative to evaluate consumer preferences and attitudes towards different  
125 types of chocolate to explore emotional marketing strategies, in order to reach consumers on a  
126 personal level, so they perceive that they are seen, heard and understood.

127 For a better understanding of the logical framework of the research, the paper was  
128 structured as follows: after an exploratory introduction (section 1), the data collection phase, the  
129 employed questionnaire and the statistical analysis are described in section 2 (Methods). The  
130 results concerning the participants socio-economics features, chocolate preferences, attitudes  
131 towards chocolate, correlation between emotions (before and after consumption) and consumer  
132 awareness towards chocolate labelling are described in section 3 (Results). These latter are  
133 discussed in section 4 which is followed by the last section of the manuscript (Conclusions,  
134 section 5).

135

## 136 2. Methods

## 2.1 Participants

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

In order to explore chocolate choice preferences, emotions before and during consumption and consumers' attention to information on the label, a choice experiment was carried out between October and December 2019. Specifically, individuals resident in the two Italian regions (Piedmont and Sicily) were involved and were directly interviewed face-to-face using a self-completed paper questionnaire. The filling in of the questionnaire took 3-4 minutes. Respondents were informed verbally about the study procedure. Interviews were carried out during the survey period from Monday to Sunday, in two time slots (from 8 a.m. to 12 p.m. and from 3 p.m. to 8 p.m.) by randomly intercepting respondents outside several shops of the main Italian large-scale retail chains (Aprile et al., 2016; Massaglia et al., 2019; Merlino et al., 2018). The English version of the questionnaire is available in Supplementary Table 1. All interviewers were graduate students from the research group, who received training on how to conduct research surveys. Our criteria comprised adolescents and adults. The number of female and male interview from the two different location was balanced (Table 1). The study was conducted in accordance with the ethical standards laid out in the Declaration of Helsinki. The participation of all interviewed was voluntary and informed given consent was provided by all participants.

## 2.2 Questionnaires

153

154

155

The questionnaire included the socioeconomic features of respondents, chocolate consumption and preferences, attitudes towards chocolate and chocolate labelling.

156

### 2.2.1 Socioeconomics

157

158

Socioeconomic features included participant characteristics such as gender, age, academic qualifications, occupation, family size and monthly household revenue.

159 *2.2.2 Chocolate consumption and preferences*

160 Regarding chocolate consumption and preferences, double check-all-that-apply (CATA)  
161 questions were asked (Ares and Jaeger, 2015). The frequency of consumption was investigated  
162 with the question “How often do you consume chocolate?” providing the following possible  
163 answers: daily, several times a week, less than once a week, occasionally (e.g., during holidays).  
164 The types of chocolate preferred by the interviewees were explored by asking the multiple-  
165 choice question “Which chocolate do you prefer?” providing the following possible answers:  
166 extra-dark, dark, white, milk, aromatic, gianduia, and chocolate with added ingredients (cereals,  
167 dehydrated or dried fruits, and nuts) as described in Table 2.

168 In this questionnaire section the question “What kind of chocolate formats do you usually  
169 consume?” was also provided to investigate the individual’s preferences towards chocolate  
170 formats. The respondents could choose among the following answers: ‘bar’, ‘assorted (pralines)’,  
171 ‘spreadable’, ‘culinary preparations (hot chocolate, puddings)’, ‘bakery confectionery (cakes,  
172 snacks, biscuits)’, ‘fresh pastries’ and ‘ice cream’.

173 *2.2.3 Consumer attitudes*

174 The participants were asked to reply to two check-all-that-apply (CATA) questions in this  
175 section. A combination of primary-secondary emotions and/or feelings were proposed to the  
176 interviewee in an range of choice: ‘hungry’, ‘craving’, ‘happy’, ‘angry’, ‘bored’, ‘anxious’,  
177 ‘tired’, ‘sad’, ‘lonely’ or ‘other’ to indicate the emotional states generated when consuming  
178 chocolate (question: “do you consume chocolate when you feel ....”. Then, participants could  
179 indicate the emotions/sensations and/or effects observed after consuming chocolate choosing  
180 among: ‘full’, ‘eating more’, ‘energetic’, ‘satisfied’, ‘happy’, ‘angry’, ‘disgusted’, ‘guilty’,

181 ‘anxious’, ‘tired’, ‘sad’ or ‘lonely’ (question: “how do you feel after eating chocolate?”).  
182 Participants could select more than one descriptor. The choice of these–descriptor emotions is  
183 based on recent literature research which suggests that both physical sensations and emotions  
184 have an effect on chocolate consumption (Kandiah et al., 2006; Lagast et al., 2018; Macht &  
185 Dettmer, 2006; Steinsbekk et al., 2018; Wansink et al., 2003; Willem et al., 2020).

#### 186 2.2.4 Chocolate labelling

187 Regarding the CATA question “How often do you read the chocolate information on the  
188 label?”, participants could answer ‘never’, ‘rarely’, ‘sometimes’, ‘often’, and ‘always’. Whereas,  
189 the question: “Which chocolate information do you read on the label?”, participants could  
190 answer ‘nutritional facts- amount of sugar and/or fat, caloric intake, vitamin and mineral content,  
191 etc’, ‘cocoa quantity’, ‘cocoa origin’, ‘environmental certifications’, ‘ethical disclosure’, ‘vegan  
192 statement’, ‘organic certification’, ‘fair trade certification’, ‘precautionary allergen statement,  
193 gluten-free, lactose-free, etc’, ‘functional claims -supplements, probiotics, etc’. Participants  
194 could select more than one descriptor.

### 195 2.3 Statistical analysis

196 Statistical analyses were carried out using generalised linear mixed-effect models (*glmm*).  
197 Mixed models were chosen due to their ability to capture both fixed (gender: women and men;  
198 and region: Piedmont and Sicily) and random effects (number of subjects, n= 390). The *P*-values  
199 were adjusted using Bonferroni's method and when the mixed model revealed significant  
200 differences ( $P < 0.05$ ), the least significant difference test was applied. Mixed models were built  
201 and evaluated according to Crawley (2007) using R version 3.3.2. Correspondence Analysis  
202 (CA) was performed from the relative prevalence table, obtained from the preference of

203 consumers towards different types of chocolate and formats and the attitudes reported before and  
204 after chocolate consumption, to visualise similarities and differences among the consumers using  
205 the *CA* function (*FactoMineR* package) and plotted through the *Factoextra* package of R version  
206 3.3.2. The Spearman's rank correlation coefficient was obtained as a measure of the association  
207 between the attitudes before and after chocolate consumption using the *psych* function and  
208 plotted through the *corrplot* package of R.

209

### 210 **3. Results**

#### 211 **3.1 Participant socioeconomics**

212 In total, 421 participants completed the survey, but only 390 met our selection criteria.  
213 Overall, the surveys completed by 284 women (Piedmont = 141 and Sicily = 143) and 109 men  
214 (Piedmont = 54 and Sicily = 55) aged between 19 to 63 years, from two different regions in Italy  
215 were considered for this study (Table 1). The gender imbalance, in both regions, is probably due  
216 to the fact that the interviews were conducted at food shops where, typically in Italy, it is mainly  
217 women who represent the household purchasing manager (Bernardi, 2016; Aprile et al., 2016;  
218 Massaglia et al., 2019; Merlino et al., 2018). More than 50% of respondents hold a bachelor's  
219 degree or high school education. More than 30% of respondents have 4 family members and  
220 receive a monthly salary between 2,000 and 4,000€ and between 1,000 and 2,000€ in Piedmont  
221 and Sicily, respectively (Table 1).

#### 222 **3.2 Chocolate preferences**

223 The most highly preferred chocolates among responders were dark, extra-dark and milk  
224 in both Italian regions (Table 3). However, a significantly higher percentage of women from

225 Piedmont preferred gianduia and aromatic chocolate and ice cream as a type of chocolate format  
226 when compared with women from Sicily. In contrast, a significantly higher percentage of men  
227 from Piedmont preferred gianduia and spreadable and culinary preparations as a type of  
228 chocolate format when compared with men from Sicily ( $P < 0.05$ ). In addition, a significantly  
229 higher percentage of men from Sicily preferred fresh pastries as a type of chocolate format when  
230 compared with women from Sicily, whereas a significantly higher percentage of Sicilian women  
231 preferred culinary preparations as a type of format, when compared to Sicilian men ( $P < 0.05$ ,  
232 Table 3).

233 Figure 1 shows a representation of the type of chocolate and format preferred by Italian  
234 consumers. The CA of the chocolate preference explained 90.9% of the total variance and  
235 illustrated that the type of chocolate and the format were closely related to gender and location as  
236 key influencing factors. In synthesis, three clusters were identified in this data set, in which the  
237 chocolate preferences of male Sicilian consumers differed from Sicilian women and both men  
238 and women together of the Piedmont region. Chocolate with added ingredients (nuts and cereals)  
239 was found to have a high correspondence with culinary preparations, spreadable and assorted  
240 types of chocolate formats preferred by Sicilian women. The preference of (both male and  
241 female)-consumers from the Piedmont region was closely related to gianduia, aromatic chocolate  
242 and chocolate with added ingredients (dried fruit) and ice cream as a preferable chocolate format.  
243 Extra-dark, white and dark chocolate were found to have a high correspondence with bakery and  
244 bar types of chocolate formats, while milk chocolate was found to have a high correspondence  
245 with fresh pastry as a preferred chocolate format indicated by Sicilian men (Figure 1).

### 246 3.3 Attitudes towards chocolate



247           The attitudes recorded before and after chocolate consumption were assessed to explain  
248 the basis of chocolate choices and emotional influences (Figure 2). Overall, both CA showed that  
249 different attitudes were closely related to a certain type of chocolate, whereby gender and  
250 location were considered key influencing factors. Concerning the attitudes reported before  
251 consumption (Figure 2A), the CA explained 94.1% of the total variance and showed a distinction  
252 between the attitudes reported before consuming chocolate from the two different Italian regions  
253 (Piedmont and Sicily) and gender distinction only in Sicily. Chocolate with added ingredients  
254 (nuts, cereal or dried fruit), gianduia and aromatic chocolates were closely related to unpleasant  
255 emotions, such as sadness, loneliness, anxiety, tiredness and boredom reported by Piedmont  
256 consumers and Sicilian women. In contrast, the attitudes towards white, dark, extra dark and  
257 milk chocolate before consumption were closely related to basic emotions (happiness and anger)  
258 and sensations connected to the feeling of emptiness (hungry and craving) of Sicilian men.

259           Regarding the attitudes reported after consumption (Figure 2B), the CA explained 94.4%  
260 of the total variance and showed a distinction between attitudes after consuming chocolate of the  
261 two different Italian regions (Piedmont and Sicily) and gender distinction only in the Piedmont  
262 region. Gianduia, aromatic chocolate and chocolate with added ingredients (dried fruit) were  
263 closely related to fullness sensations reported by Piedmont men, while the attitude of women  
264 from the same region after the consumption of chocolate with added ingredients (nuts or cereals)  
265 was closely related to guilt emotions. The attitudes after consuming dark chocolate were closely  
266 related to happiness and satisfaction emotions of Sicilian consumers. Energetic sensations after  
267 the consumption of milk chocolate, and the sensation of eating more extra-dark and white  
268 chocolate were also closely related to Sicilian consumers.

### 3.4 Correlations between attitudes reported before and after chocolate consumption

Significant correlations between the attitudes reported before and after chocolate consumption of Piedmont and Sicilian women and Piedmont and Sicilian men were observed ( $P < 0.05$ , Figure 3). Within each correlation plot of the different attitudes reported by the 4 types of consumers, we observed more significantly positive correlations from Piedmont consumers than Sicilians (Supplementary Table 2). A similar emotional pattern towards chocolate consumption was observed by Italian women regardless of their origin, where craving sensations were positively correlated with feelings of eating more and satisfaction; anger and guilt; tiredness and energetic feelings before and after chocolate consumption. Interestingly, eleven significantly positive correlations were observed in the male Piedmont data set, where only the positive correlation between emotions of boredom and the sensation of eating more, before and after chocolate consumption, also corresponded to women originating from Piedmont (Figure 3,  $P < 0.05$ ). No significant associations between attitudes reported before and after chocolate consumption were found in the data of Sicilian men (data not shown).

### 3.5 Awareness towards chocolate labelling information

Italian awareness towards chocolate labelling information is reported in Table 4. Overall, most of the participants never read the label. In contrast, the minority of participants that read the label pay attention to the cocoa quantity, nutritional facts and fair-trade certification. Of note, a lower percentage of Sicilian consumers look for environmental certification and ethical disclosure compared to the Piedmont consumers.

#### 4. Discussion

This study compared the preferences and attitudes of chocolate consumers from two different regions of Italy: Piedmont and Sicily. The comparison included the following aspects: chocolate preferences in terms of types and formats available on the market; linking emotional attitudes before and after chocolate consumption and a correlations analysis between the attitudes reported before and after chocolate consumption. The socio-demographic characteristics of the two samples are in accordance with some authors (Bernardi 2016; Aprile et al., 2016; Massaglia et al., 2019; Merlino et al., 2018) in terms of gender composition, while represent the real profiles of randomly chosen purchasers in the selected geographical areas.

In Europe, the chocolates most highly preferred by consumers are dark and extra dark (CBI, 2020). In Italy, the increasing demand for these chocolates has been reported, especially in Sicily (Corriere Etneo, 2018). This trend might be associated with the male preference towards chocolate with a strong and bitter taste, in comparison to female preferences (Harwood et al., 2012). Overall, individuals that tolerate the more bitter tastes exalted by low-fat chocolate, prefer dark and extra-dark chocolate (Metcalf & Vickers, 2002; Harwood et al., 2013). Women have shown significantly higher levels of sensitivity to bitterness than males and are therefore less tolerant, while no difference has been reported in the levels of perception of sweetness between genders (Yoshinaka et al., 2016).

The emotional complexity surrounding food, evocating negative or positive emotions that emerge among individuals is well discriminated between the genders. The distinction between gender preferences towards sweet and caloric products, such as snacks like chocolate and their attitudes has been studied elsewhere (Grogan et al., 1997; Klatzkin et al., 2018; Lombardo et al., 2019). Chocolate is considered one of the main and most preferable comfort foods (foods whose

314 consumption provides consolation or a feeling of well-being) for women as reported elsewhere  
315 (Spence, 2017). Women tend to "eat light", but at the same time have a greater preference  
316 towards not only comfort foods but also eating for pleasure or even in response to a negative  
317 emotional condition, in comparison to men (Wansink et al., 2003; Spence, 2017). This attitude  
318 was also observed in the present study where women prefer to satisfy their palate (positive  
319 correlation between cravings and the feeling of eating more). In contrast to this observation,  
320 recent literature suggests that men are pleasure seekers *per excellence* when choosing foods such  
321 as meat, flour-based foods and others (Lombardo et al., 2019; Spence, 2017). Further research is  
322 needed to investigate the consumption of chocolate driven by male attitudes and to monitor the  
323 cause–effect of emotions before, during and after chocolate consumption.

324         According to Nasser *et al.* (2011), males frequently consume chocolate and women only  
325 occasionally. However, the tendency to eat calorie-rich foods in an uncontrolled way is a typical  
326 female attitude (Lombardo et al., 2019). In the present study, women seem more likely to eat  
327 chocolate occasionally, this might be associated with skipping meals during the day causing the  
328 impulse to crave foods, such as chocolate. Chocolate cravings are triggered by its physical,  
329 chemical and rheological properties, such as fat, sugar, texture and aroma, which can even lead  
330 to addictive behaviours, especially in sensitive people (Bruinsma & Taren, 1999; Gearhardt et  
331 al., 2014; Rozin et al., 1991; Yanovski, 2003, Franco et al., 2013; Smit et al., 2004). However,  
332 chocolate cravings by women are often episodic and fluctuate with hormonal changes (just  
333 before and during menstruation) and mood swings, which lead to compulsive behaviours and  
334 trigger more chocolate cravings (Bruinsma & Taren, 1999).

335         Chocolate is one of the main confectionery snack foods consumed in response to a  
336 negative mood (Bongers & Jansen, 2017; Bruinsma & Taren, 1999; Hill et al., 1991). This

337 assertion is also observed in the present study, participants associated feeling tired, bored,  
338 anxious and lonely before consuming gianduia and chocolate with added ingredients in the form  
339 of ice cream. The feeling of belonging and familiarity after consumption of gianduia chocolate  
340 might be associated with a personal reward in a negative emotional moment. In this regard,  
341 recent literature highlights the importance of local culinary traditions for Piedmont consumers  
342 during the process of food choice decisions (Massaglia et al., 2018; Merlino et al., 2018; Merlino  
343 et al., 2020). In general, the consumption of chocolate generates a positive memory after feeling  
344 lonely or tired (Macht & Dettmer, 2006). However, negative emotions can also be caused after  
345 consumption of a caloric product, such as chocolate. Women indicated feeling a sense of guilt  
346 after chocolate consumption (Exline et al., 2012; Grogan et al., 1997; Macdiarmid &  
347 Hetherington, 1995). Food choices can be locked in vicious cycles that affect the food  
348 consumption patterns of females already at an early age, this behaviour seems to contribute to the  
349 increased risk of developing exaggerated concerns about body shape and weight (Cartwright et  
350 al., 2007). In contrast, gratifying sensations of fullness prevail after chocolate consumption in  
351 males (Drewnowski et al., 2012; Wansink et al., 2003).

352         The sensation of feeling hungry and tired before eating and then feeling happy, energised  
353 and full is typically associated with the consumption of energetic food products to fulfil a  
354 physical need (Drewnowski et al., 2012; Finlayson et al., 2007). This assertion is also  
355 highlighted in our correlation analysis where Piedmont consumers reported similar attitudes  
356 towards the consumption of chocolate (positive correlation: feeling tired before chocolate  
357 consumption and feeling happy or energetic after chocolate consumption). One also notes that  
358 often, the consumption of caloric foods, rich in fats and sugars, is not followed by a negative  
359 emotional state when intake is due to hunger, while it generates negative emotions when

360 consumed to meet different emotional states (Finlayson et al., 2007). This assertion was also  
361 observed in the data obtained from males originating from Piedmont, in which negative emotions  
362 were reported before and after chocolate consumption (positive correlation between anxiety and  
363 sadness; anger and guilty feelings, and sadness and guilty feelings).

364 The geographical area and cultural context are well-known factors that influence  
365 emotional eating. According to Dubé *et al.* (2005), the consumption of chocolate by French  
366 citizens is driven by positive emotions, while negative emotions before chocolate consumption  
367 are perceived by women with an English cultural background. The findings of the present study  
368 highlight how the geographical area, and therefore the cultural background, affect chocolate  
369 preferences and the emotions that revolve around its consumption. Sicilian women reported  
370 positive emotions after chocolate consumption (fullness, feeling energetic and satisfied), whereas  
371 Piedmont women associated chocolate consumption with negative and addictive emotions  
372 (eating more and guilty feelings).

373 Negative effects of chocolate consumption have been mainly associated with people with  
374 disordered eating habits, weight problems, or significant social pressure (Exline et al., 2012;  
375 Grogan et al., 1997; Macdiarmid & Hetherington, 1995). Macht and Dettmer (2006) evidenced  
376 that chocolate induces both positive and negative emotions in healthy and normal-weight  
377 women. While the perception of women towards chocolate consumption is widely studied in  
378 terms of emotions perceived, to the best of the authors' knowledge, this is not the case for men.  
379 Thus, further research is needed to investigate the emotional connotation of chocolate  
380 consumption from a male standpoint, to understand their motivations towards eating chocolate,  
381 especially those with a high sugar and cocoa content. This information could help the industry

382 and academics to understand the nature of the emotional ambivalence caused by chocolate  
383 consumption, by both women and men.

384

#### 385 **4. Conclusions**

386 The present research showed how cultural context and gender determine different  
387 emotional perceptions when different types of chocolate are consumed. The results suggest that  
388 chocolate preferences are linked to the characteristics of the product, however they also highlight  
389 the emotions that can determine the consumption of the product. This research provides a  
390 description of the emotional processes of chocolate consumption behaviour and chocolate  
391 preferences, which can be used for producers to orient marketing communication strategies  
392 based on emotional claims, in order to effectively connect with consumers, responding to  
393 concerns and implementing a more personal and non-transactional relationship. Even so, this  
394 research highlights some limitations attributable to the composition of the sample, unbalanced in  
395 some respects, and its size that could be expanded in future work.

396

397 **Author contributions: Valentina Maria Merlino:** Methodology, Investigation, Writing  
398 – original draft, Writing – review & editing. **Jatziri Mota Gutierrez:** Formal analysis, Data  
399 curation, Visualisation, Writing – original draft, Writing – review & editing. **Danielle Borra:**  
400 Resources, Writing – review & editing. **Filippo Brun:** Writing – review & editing. **Luca**  
401 **Cocolin:** Writing – review & editing. **Simone Blanc:** Conceptualisation, Writing – review &  
402 editing, Validation, Project administration. **Stefano Massaglia:** Writing – review & editing. All  
403 authors have read and agree to a published version of the final version of the manuscript.

404           **Funding.** This research did not receive any specific grant from funding agencies in the  
405 public, commercial, or not-for-profit sectors.

406           **Conflict of interest.** The authors declare no conflict of interest

407

Journal Pre-proof



408 **References**

- 409 Alberts, H. J. E. M., Thewissen, R., & Raes, L. (2012). Dealing with problematic eating behaviour. The  
410 effects of a mindfulness-based intervention on eating behaviour, food cravings, dichotomous  
411 thinking and body image concern. *Appetite*, 58, 847–851.  
412 <https://doi.org/10.1016/j.appet.2012.01.009>
- 413 Al-Thubaity, A., Alharbi, M., Alqahtani, S., & Aljandal, A. (2018). A saudi dialect twitter corpus for  
414 sentiment and emotion analysis. *2018 21st Saudi Computer Society National Computer  
415 Conference (NCC)*, 1–6.
- 416 Aprile, M.C., Caputo, V., & Nayga Jr, R.M. (2016). Consumers' preferences and attitudes toward local  
417 food products. *Journal of food products marketing*, 22(1),19-42.
- 418 Ares, G., & Jaeger, S. R. (2015). Check-all-that-apply (CATA) questions with consumers in practice:  
419 Experimental considerations and impact on outcome. In *Rapid sensory profiling techniques* (pp.  
420 227-245). Woodhead Publishing.
- 421 Atlante del cibo. (2017). *Il distretto piemontese del cioccolato – Atlante del Cibo*.  
422 <https://atlantedelcibo.it/2017/05/27/il-distretto-piemontese-del-cioccolato/>
- 423 Baptista, I., Valentin, D., Saldaña, E., & Behrens, J. (2021). Effects of packaging color on expected  
424 flavor, texture and liking of chocolate in Brazil and France. *International Journal of Gastronomy  
425 and Food Science*, 100340.
- 426 Baresani, C. (Ed.). (2011). *Alla ricerca del cacao perduto. In viaggio con Gianluca Franzoni per svelare  
427 la magia del cioccolato*. Edition Gribaudo.
- 428 Becker-Asano, C., & Wachsmuth, I. (2009). Affective computing with primary and secondary emotions  
429 in a virtual human. *Autonomous Agents and Multi-Agent Systems*, 20, 32.  
430 <https://doi.org/10.1007/s10458-009-9094-9>

- 431 Bernardi, R. (2016). In the Italian shop, the target group is women (in Italian). Fresh Plaza.  
432 <https://www.freshplaza.it/article/4083109/nel-punto-vendita-italiano-il-target-e-donna/>. Accessed  
433 on 27/05/2021.
- 434 Bongers, P., & Jansen, A. (2017). Emotional eating and Pavlovian learning: Evidence for conditioned  
435 appetitive responding to negative emotional states. *Cognition and Emotion*, *31*, 284–297.  
436 <https://doi.org/10.1080/02699931.2015.1108903>
- 437 Braden, A., Musher-Eizenman, D., Watford, T., & Emley, E. (2018). Eating when depressed, anxious,  
438 bored, or happy: Are emotional eating types associated with unique psychological and physical  
439 health correlates?. *Appetite*, *125*, 410–417.  
440 <https://doi.org/10.1016/j.appet.2018.02.022>
- 441 Bruinsma, K., & Taren, D. L. (1999). Chocolate: Food or drug? *Journal of the American Dietetic*  
442 *Association*, *99*, 1249–1256. [https://doi.org/10.1016/S0002-8223\(99\)00307-7](https://doi.org/10.1016/S0002-8223(99)00307-7)
- 443 Cartwright, F., Stritzke, W. G. K., Durkin, K., Houghton, S., Burke, V., & Beilin, L. J. (2007). Chocolate  
444 craving among children: Implications for disordered eating patterns. *Appetite*, *48*, 87–95.  
445 <https://doi.org/10.1016/j.appet.2006.07.081>
- 446 Centre for the Promotion of Imports from developing countries (CBI). (2020). The Italian market  
447 potential for cocoa. Retrieved October 8, 2020, from [https://www.cbi.eu/market-](https://www.cbi.eu/market-information/cocoa-cocoa-products/italy/market-potential)  
448 [information/cocoa-cocoa-products/italy/market-potential](https://www.cbi.eu/market-information/cocoa-cocoa-products/italy/market-potential)
- 449 Centre for the Promotion of Imports from developing countries (CBI). (2020). What is the demand for  
450 cocoa on the European market? Retrieved October 7, 2020, from [https://www.cbi.eu/market-](https://www.cbi.eu/market-information/cocoa/trade-statistics)  
451 [information/cocoa/trade-statistics](https://www.cbi.eu/market-information/cocoa/trade-statistics)
- 452 Chen, J.-L., Chen, M.-C., Chen, C.-W., & Chang, Y.-C. (2007). Architecture design and performance  
453 evaluation of RFID object tracking systems. *Computer Communications*, *30*, 2070–2086.  
454 <https://doi.org/10.1016/j.comcom.2007.04.003>

- 455 Cherry, K. (2020). The 6 Types of Basic Emotions and Their Effect on Human Behavior. Verywellmind.  
456 <https://www.verywellmind.com/an-overview-of-the-types-of-emotions-4163976#citation-1>
- 457 Cicia, G., Cembalo, L., Giudice, T. D., & Verneau, F. (2012). Il sistema agroalimentare ed il consumatore  
458 postmoderno: Nuove sfide per la ricerca e per il mercato. *Economia agro-alimentare*, 117-142.  
459 <https://doi.org/10.3280/ECAG2012-001006>
- 460 Crawley, M.J. (2007). The R book. John Wiley and Sons, Ltd., West Sussex, England .
- 461 Codeluppi, V. (2003). La sociologia dei consumi. Teorie classiche e prospettive contemporanee. *Carocci*,  
462 1-195. ISBN: 8843020951
- 463 Corriere Etneo. (2018, July 8). In Sicilia boom del cioccolato, consumi + 230% a Catania: Il cannolo nella  
464 top ten. *Corriere Etneo*. [https://www.corrieretneo.it/2018/07/08/in-sicilia-boom-del-cioccolato-](https://www.corrieretneo.it/2018/07/08/in-sicilia-boom-del-cioccolato-consumi-230-a-catania-il-cannolo-nella-top-ten/)  
465 [consumi-230-a-catania-il-cannolo-nella-top-ten/](https://www.corrieretneo.it/2018/07/08/in-sicilia-boom-del-cioccolato-consumi-230-a-catania-il-cannolo-nella-top-ten/)
- 466 de Andrade Silva, A. R., Bioto, A. S., Efraim, P., & de Castilho Queiroz, G. (2017). Impact of  
467 sustainability labeling in the perception of sensory quality and purchase intention of chocolate  
468 consumers. *Journal of Cleaner Production*, 141, 11–21.  
469 <https://doi.org/10.1016/j.jclepro.2016.09.024>
- 470 Del Prete, M., & Samoggia, A. (2020). Chocolate consumption and purchasing behaviour review:  
471 Research issues and insights for future research. *Sustainability*, 12, 5586.  
472 <https://doi.org/10.3390/su12145586>
- 473 Drewnowski, A., Mennella, J. A., Johnson, S. L., & Bellisle, F. (2012). Sweetness and food preference.  
474 *The Journal of Nutrition*, 142, 1142S-1148S. <https://doi.org/10.3945/jn.111.149575>
- 475 Dubé, L., LeBel, J. L., & Lu, J. (2005). Affect asymmetry and comfort food consumption. *Physiology &*  
476 *Behavior*, 86, 559–567. <https://doi.org/10.1016/j.physbeh.2005.08.023>
- 477 Ekman, P. (1999). Basic emotions. *Handbook of Cognition and Emotion*, 98(45–60), 16.
- 478 Else-Quest, N. M., Higgins, A., Allison, C., & Morton, L. C. (2012). Gender differences in self-conscious  
479 emotional experience: A meta-analysis. *Psychological Bulletin*, 138, 947.  
480 <https://doi.org/10.1037/a0027930>

- 481 Exline, J. J., Zell, A. L., Bratslavsky, E., Hamilton, M., & Swenson, A. (2012). People-pleasing through  
482 eating: Sociotropy predicts greater eating in response to perceived social pressure. *Journal of*  
483 *Social and Clinical Psychology, 31*, 169–193. <https://doi.org/10.1521/jscp.2012.31.2.169>
- 484 Finlayson, G., King, N., & Blundell, J. E. (2007). Is it possible to dissociate ‘liking’ and ‘wanting’ for  
485 foods in humans? A novel experimental procedure. *Physiology & Behavior, 90*, 36–42.  
486 <https://doi.org/10.1016/j.physbeh.2006.08.020>
- 487 Franco, R., Oñatibia-Astibia, A., & Martínez-Pinilla, E. (2013). Health benefits of methylxanthines in  
488 cacao and chocolate. *Nutrients, 5*, 4159–4173. <https://doi.org/10.3390/nu5104159>
- 489 Gabrielli, V., & Baghi, I. (2016). Online brand community within the integrated marketing  
490 communication system: When chocolate becomes seductive like a person. *Journal of Marketing*  
491 *Communications, 22*, 385–402. <https://doi.org/10.1080/13527266.2014.894932>
- 492 Galimberti, I. (2018). *DolciSalati e Consumi Speciale Cioccolato*. Fairtrade.it.  
493 [https://www.fairtrade.it/wp-](https://www.fairtrade.it/wp-content/uploads/2018/10/DolciSalati_e_Consumi_Speciale_Cioccolato.pdf)  
494 [content/uploads/2018/10/DolciSalati\\_e\\_Consumi\\_Speciale\\_Cioccolato.pdf](https://www.fairtrade.it/wp-content/uploads/2018/10/DolciSalati_e_Consumi_Speciale_Cioccolato.pdf)
- 495 Gearhardt, A. N., Rizk, M. T., & Treat, T. A. (2014). The association of food characteristics and  
496 individual differences with ratings of craving and liking. *Appetite, 79*, 166–173.  
497 <https://doi.org/10.1016/j.appet.2014.04.013>
- 498 Grogan, S. C., Bell, R., & Conner, M. (1997). Eating sweet snacks: Gender differences in attitudes and  
499 behaviour. *Appetite, 28*, 19–31. <https://doi.org/10.1006/appe.1996.0067>
- 500 Gruber, J., Moskowitz, J.T. (2014). Positive emotion, integrating the light sides and dark sides. Oxford:  
501 Oxford university press, USA. doi:10.1093/acprof:oso/9780199926725.001.0001
- 502 Harwood, M. L., Loquasto, J. R., Roberts, R. F., Ziegler, G. R., & Hayes, J. E. (2013). Explaining  
503 tolerance for bitterness in chocolate ice cream using solid chocolate preferences. *Journal of Dairy*  
504 *Science, 96*, 4938–4944. <https://doi.org/10.3168/jds.2013-6715>

- 505 Harwood, M. L., Ziegler, G. R., & Hayes, J. E. (2012). Rejection thresholds in chocolate milk: Evidence  
506 for segmentation. *Food Quality and Preference*, *26*, 128–133.  
507 <https://doi.org/10.1016/j.foodqual.2012.04.009>
- 508 Hill, A. J., Weaver, C. F., & Blundell, J. E. (1991). Food craving, dietary restraint and mood. *Appetite*,  
509 *17*, 187–197. [https://doi.org/10.1016/0195-6663\(91\)90021-J](https://doi.org/10.1016/0195-6663(91)90021-J)
- 510 Hussain, M., Egan, H., Keyte, R., & Mantzios, M. (2020). Exploring the effects of mindfulness and self-  
511 distancing on chocolate intake after a negative state affect. *Journal of Cognitive Enhancement*, 1–  
512 10.
- 513 Istituto Nazionale di Statistica (ISTAT). (2020). Dati statistici per il territorio.  
514 <https://www.istat.it/it/archivio/243448>
- 515 Kakoschke, N., Kemps, E., & Tiggemann, M. (2014). Attentional bias modification encourages healthy  
516 eating. *Eating Behaviors*, *15*, 120–124. <https://doi.org/10.1016/j.eatbeh.2013.11.001>
- 517 Kandiah, J., Yake, M., Jones, J., & Meyer, M. (2006). Stress influences appetite and comfort food  
518 preferences in college women. *Nutrition Research*, *26*, 118–123.  
519 <https://doi.org/10.1016/j.nutres.2005.11.010>
- 520 Kempen, E., Kasambala, J., Christie, L., Symington, E., Jooste, L., & Van Eeden, T. (2017). Expectancy-  
521 value theory contributes to understanding consumer attitudes towards cow's milk alternatives and  
522 variants. *International Journal of Consumer Studies*, *41*, 245–252.  
523 <https://doi.org/10.1111/ijcs.12331>
- 524 Kiefer, I., Rathmanner, T., & Kunze, M. (2005). Eating and dieting differences in men and women.  
525 *Journal of Men's Health and Gender*, *2*, 194–201. <http://doi.org/10.1016/j.jmhg.2005.04.010>
- 526 Klatzkin, R. R., Gaffney, S., Cyrus, K., Bigus, E., & Brownley, K. A. (2018). Stress-induced eating in  
527 women with binge-eating disorder and obesity. *Biological Psychology*, *131*, 96–106.  
528 <https://doi.org/10.1016/j.biopsycho.2016.11.002>

- 529 Krieger, J.-P., Pestoni, G., Cabaset, S., Brombach, C., Sych, J., Schader, C., Faeh, D., & Rohrmann, S.  
530 (2019). Dietary patterns and their sociodemographic and lifestyle determinants in Switzerland:  
531 Results from the National Nutrition Survey menuch. *Nutrients*, *11*, 62.  
532 <https://doi.org/10.3390/nu11010062>
- 533 Lagast, S., De Steur, H., Schouteten, J. J., & Gellynck, X. (2018). A comparison of two low-calorie  
534 sweeteners and sugar in dark chocolate on sensory attributes and emotional conceptualisations.  
535 *International Journal of Food Sciences and Nutrition*, *69*, 344–357.  
536 <https://doi.org/10.1080/09637486.2017.1362689>
- 537 Lake, E. (2015). “Two things I like, maths and chocolate”: Exploring ethical hedonism in secondary  
538 mathematics teaching. CERME 9 - Ninth Congress of the European Society for Research in  
539 Mathematics Education, Charles University in Prague, Faculty of Education; ERME, Feb 2015,  
540 Prague, Czech Republic. pp.1209-1215.
- 541 Lanza, C. M., Mazzaglia, A., & Pagliarini, E. (2011). Sensory profile of a specialty Sicilian chocolate.  
542 *Italian Journal of Food Science*, *23*(1), 36–44.
- 543 Leyens, J.-P., RodriguezPerez, A., RodriguezTorres, R., Gaunt, R., Paladino, M.-P., Vaes, J., &  
544 Demoulin, S. (2001). Psychological essentialism and the differential attribution of uniquely  
545 human emotions to ingroups and outgroups. *European Journal of Social Psychology*, *31*, 395–  
546 411. <https://doi.org/10.1002/ejsp.50>
- 547 Liao, L. X., Corsi, A. M., Chrysochou, P., & Lockshin, L. (2015). Emotional responses towards food  
548 packaging: A joint application of self-report and physiological measures of emotion. *Food*  
549 *Quality and Preference*, *42*, 48–55. <https://doi.org/10.1016/j.foodqual.2015.01.009>
- 550 Lombardo, M., Aulisa, G., Padua, E., Annino, G., Iellamo, F., Pratesi, A., Caprio, M., & Bellia, A.  
551 (2019). Gender differences in taste and foods habits. *Nutrition & Food Science*, *50*, 229–239.  
552 <https://doi.org/10.1108/NFS-04-2019-0132>

- 553 Macdiarmid, J. I., & Hetherington, M. M. (1995). Mood modulation by food: An exploration of affect and  
554 cravings in 'chocolate addicts.' *British Journal of Clinical Psychology*, *34*, 129–138.  
555 <https://doi.org/10.1111/j.2044-8260.1995.tb01445.x>
- 556 Macht, M., & Dettmer, D. (2006). Everyday mood and emotions after eating a chocolate bar or an apple.  
557 *Appetite*, *46*, 332–336. <https://doi.org/10.1016/j.appet.2006.01.014>
- 558 Magli, F., & Nobolo, A. (2016). Piemonte, the most famous Italian chocolate 'District.' *Accounting and*  
559 *Food: Some Italian Experiences*, 118.
- 560 Maleki, S., Amiri Aghdaie, S. F., Shahin, A., & Ansari, A. (2020). Investigating the relationship among  
561 the Kansei-based design of chocolate packaging, consumer perception, and willingness to buy.  
562 *Journal of Marketing Communications*, *26*, 836–855.  
563 <https://doi.org/10.1080/13527266.2019.1590855>
- 564 MarketWatch. (2020). *Fairtrade Organic Chocolate Market 2020—Global Industry Growth Rate, Share,*  
565 *Size, Price, Prospect, Developments and Forecast till 2026*. MarketWatch.  
566 [https://www.marketwatch.com/press-release/fairtrade-organic-chocolate-market-2020---global-](https://www.marketwatch.com/press-release/fairtrade-organic-chocolate-market-2020---global-industry-growth-rate-share-size-price-prospect-developments-and-forecast-till-2026-2020-08-10)  
567 [industry-growth-rate-share-size-price-prospect-developments-and-forecast-till-2026-2020-08-10](https://www.marketwatch.com/press-release/fairtrade-organic-chocolate-market-2020---global-industry-growth-rate-share-size-price-prospect-developments-and-forecast-till-2026-2020-08-10)
- 568 Massaglia, S., Merlino, V. M., Borra, D., Bargetto, A., Sottile, F., & Peano, C. (2019). Consumer  
569 Attitudes and Preference Exploration towards Fresh-Cut Salads Using Best–Worst Scaling and  
570 Latent Class Analysis. *Foods*, *8*(11), 568.
- 571 Massaglia, S., Merlino, V., & Borra, D. (2018). Marketing strategies for animal welfare meat  
572 identification: Comparison of preferences between millennial and conventional consumers.  
573 *Quality- Access to success* *19*, 305–311.
- 574 Merlino, V. M., Borra, D., Girgenti, V., Dal Vecchio, A., & Massaglia, S. (2018). Beef meat preferences  
575 of consumers from Northwest Italy: Analysis of choice attributes. *Meat Science*, *143*, 119–128.  
576 <https://doi.org/10.1016/j.meatsci.2018.04.023>

- 577 Merlino, V. M. , Blanc, S., Massaglia, S., & Borra, D. (2020). Innovation in craft beer packaging:  
578 Evaluation of consumer perception and acceptance. *AIMS Agriculture and Food*, 5, 422.  
579 <https://doi.org/10.3934/agrfood.2020.3.422>
- 580 Metcalf, K. L., & Vickers, Z. M. (2002). Taste intensities of oil-in-water emulsions with varying fat  
581 content. *Journal of Sensory Studies*, 17, 379–390. [https://doi.org/10.1111/j.1745-](https://doi.org/10.1111/j.1745-459X.2002.tb00354.x)  
582 [459X.2002.tb00354.x](https://doi.org/10.1111/j.1745-459X.2002.tb00354.x)
- 583 Naik, D., Gorojanam, N. B., & Ramesh, D. (2020). Community based emotional behaviour using  
584 ekman’s emotional scale. *International Conference on Innovations for Community Services*, 63–  
585 82.
- 586 Nasser, J. A., Bradley, L. E., Leitzsch, J. B., Chohan, O., Fasulo, K., Haller, J., Jaeger, K., Szulanczyk,  
587 B., & Del Parigi, A. (2011). Psychoactive effects of tasting chocolate and desire for more  
588 chocolate. *Physiology & Behavior*, 104, 117–121. <https://doi.org/10.1016/j.physbeh.2011.04.040>
- 589 News.italianfood.net. (2016, March 25). *Mintel, in Europe it’s chocolate mania*. Italianfood.Net.  
590 <https://news.italianfood.net/2016/03/25/mintel-in-europe-its-chocolate-mania/>
- 591 Pay, E. (2009). The market for organic and fair-trade cocoa. *Study Prepared in the Framework of FAO*  
592 *Project GCP/RAF/404/GER. Increasing Incomes and Food Security of Small Farmers in West*  
593 *and Central Africa through Exports of Organic and Fair-Trade Tropical Products*.
- 594 Petrenya, N., Rylander, C., & Brustad, M. (2019). Dietary patterns of adults and their associations with  
595 Sami ethnicity, sociodemographic factors, and lifestyle factors in a rural multiethnic population of  
596 northern Norway—The SAMINOR 2 clinical survey. *BMC Public Health*, 19, 1632.  
597 <https://doi.org/10.1186/s12889-019-7776-z>
- 598 Plutchik, R. (1994). *The psychology and biology of emotion*. New York: HarperCollins College  
599 Publishers.
- 600 Rebonato, L. F. (2020). *Italia del cioccolato*. Italianomadrelingua.  
601 <http://www.italianomadrelingua.com/italia-cioccolato.html>



- 602 Rozin, P., Levine, E., & Stoess, C. (1991). Chocolate craving and liking. *Appetite*, *17*(3), 199–212.
- 603 Sauter, D. A., Eisner, F., Ekman, P., & Scott, S. K. (2010). Cross-cultural recognition of basic emotions  
604 through nonverbal emotional vocalizations. *Proceedings of the National Academy of Sciences*,  
605 *107*, 2408–2412. <https://doi.org/10.1073/pnas.0908239106>
- 606 Scherer, K. R. (2005). Unconscious Processes in Emotion: The Bulk of the Iceberg. In *Emotion and*  
607 *consciousness* (pp. 312–334). The Guilford Press.
- 608 Schumacher, S. E., Kemps, E., & Tiggemann, M. (2016). Bias modification training can alter approach  
609 bias and chocolate consumption. *Appetite*, *96*, 219–224.  
610 <https://doi.org/10.1016/j.appet.2015.09.014>
- 611 Smit, H. J., Gaffan, E. A., & Rogers, P. J. (2004). Methylxanthines are the psycho-pharmacologically  
612 active constituents of chocolate. *Psychopharmacology*, *176*, 412–419.
- 613 Spence, C. (2017). Comfort food: A review. *International journal of gastronomy and food science*, *9*,  
614 105-109. <https://doi.org/10.1016/j.ijgfs.2017.07.001>
- 615 Steinsbekk, S., Barker, E. D., Llewellyn, C., Fildes, A., & Wichstrøm, L. (2018). Emotional feeding and  
616 emotional eating: Reciprocal processes and the influence of negative affectivity. *Child*  
617 *Development*, *89*, 1234–1246. <https://doi.org/10.1111/cdev.12756>
- 618 Sultson, H., Kukk, K., & Akkermann, K. (2017). Positive and negative emotional eating have different  
619 associations with overeating and binge eating: Construction and validation of the positive-  
620 negative emotional eating scale. *Appetite*, *116*, 423–430.  
621 <https://doi.org/10.1016/j.appet.2017.05.035>
- 622 Timms, R. & Berger, K. (2003). Chocolate, chocolate fats and the EU chocolate directive. *Journal of the*  
623 *Science of Food and Agriculture*, *83*(15), 1539-1540.
- 624 Wansink, B., Cheney, M. M., & Chan, N. (2003). Exploring comfort food preferences across age and  
625 gender. *Physiology & Behavior*, *79*, 739–747. [https://doi.org/10.1016/S0031-9384\(03\)00203-8](https://doi.org/10.1016/S0031-9384(03)00203-8)

- 626 Willem, C., Gandolphe, M.-C., Doba, K., Roussel, M., Verkindt, H., Pattou, F., & Nandrino, J.-L. (2020).  
627 Eating in case of emotion dys-regulation, depression and anxiety: Different pathways to  
628 emotional eating in moderate and severe obesity. *Clinical Obesity*, e12388.  
629 <https://doi.org/10.1111/cob.12388>
- 630 Wood, I., McCrae, J. P., Andryushechkin, V., & Buitelaar, P. (2018). A comparison of emotion  
631 annotation schemes and a new annotated data set. *Proceedings of the Eleventh International  
632 Conference on Language Resources and Evaluation (LREC 2018)*.
- 633 Yanovski, S. (2003). Sugar and fat: Cravings and aversions. *The Journal of Nutrition*, 133, 835S–837S.  
634 <https://doi.org/10.1093/jn/133.3.835S>
- 635 Yoshinaka, M., Ikebe, K., Uota, M., Ogawa, T., Okada, T., Inomata, C., Takeshita, H., Mihara, Y.,  
636 Gondo, Y., Masui, Y., Kamide, K., Arai, Y., Takahashi, R., & Maeda, Y. (2016). Age and sex  
637 differences in the taste sensitivity of young adult, young-old and old-old Japanese. *Geriatrics &  
638 Gerontology International*, 16, 1281–1288. <https://doi.org/10.1111/ggi.12638>
- 639 Zarantonello, L., & Luomala, H. T. (2011). Dear Mr Chocolate. Constructing a typology of  
640 contextualized chocolate consumption experiences through qualitative diary research. *Qualitative  
641 Market Research: An International Journal*. DOI 10.1108/13522751111099328  
642  
643

644 **TABLE LEGENDS**645 **Table 1.** Socio-demographic characteristics of participants646 **Table 2.** Chocolate categories provided to the interviewee to investigate the preferences

647 of individuals

648 **Table 3.** The prevalence of chocolate preference of Italian consumers649 **Table 4.** Consumer awareness of chocolate labelling expressed as a percentage

650 **FIGURE LEGENDS**

651 **Figure 1.** Correspondence analysis (CA) of the chocolate preferences of Italian  
652 consumers. Dimensional space showing the similarities and dissimilarities of the different types  
653 and kinds of chocolate preferred by Italian consumers is shown. Consumer groups based on  
654 gender and location are represented in red numbers: 1 represents women from Piedmont (WP); 2  
655 women from Sicily (WS); 3 men from Piedmont (MP) and 4 men from Sicily (MS).

656 **Figure 2.** Correspondence analysis (CA) of the chocolate preferences and attitudes  
657 towards chocolate from Italian consumers. Panel **A)** Attitudes before consumption of chocolate  
658 and **B)** Attitudes after consumption of chocolate. Dimensional space showing the similarities and  
659 dissimilarities of the attitudes towards chocolate consumption. Consumer groups based on  
660 gender and location are represented in red numbers: 1 represents women from Piedmont (WP); 2  
661 women from Sicily (WS); 3 men from Piedmont (MP) and 4 men from Sicily (MS).

662 **Figure 3.** Correlation plot showing Spearman's correlation between attitudes before and  
663 after chocolate consumption. Samples are labelled according to the type of consumer **A)** Women  
664 from Piedmont, **B)** Women from Sicily and **C)** Men from Piedmont. Significant correlations  
665 between chocolate attitudes are only shown ( $P < 0.05$ ). The intensity of the colours represents  
666 the degree of correlation between attitudes reported before and after chocolate consumption, as  
667 measured by Spearman's correlation, where the colour blue represents a positive degree of  
668 correlation and red a negative correlation between attitudes.

669 **Table 1**

	Piedmont		Sicily	
	Women	Men	Women	Men
<b>Participants</b>	n=141	n=54	n=143	n= 55
<b>Socioeconomics</b>				
<i>Age (average)</i>	36.69 y	31.65 y	37.33 y	33.95 y
<i>Education</i>				
· Lower secondary school	43.97%	50.00%	49.65%	38.18%
· Bachelor or master's degree	45.39%	40.74%	31.47%	45.15%
· Upper secondary School	7.80%	7.41%	17.48%	14.55%
· Master/PhD	2.84%	1.85%	1.40%	1.82%
<i>Status</i>				
· Single	8.51%	9.26%	4.90%	7.27%
· 2 family members	18.44%	14.81%	9.09%	7.27%
· 3 family members	21.99%	31.48%	25.87%	14.55%
· 4 family members	40.43%	29.63%	45.45%	52.73%
· More than 5 family members	10.64%	14.81%	14.69%	18.18%
<i>Household monthly income</i>				
· Less than 1,000 €	2.9%	5.1%	12.2%	12.2%
· Between 1,000 and 2,000 €	26.4%	22.0%	30.4%	28.6%
· Between 2,000 and 4,000 €	34.5%	39.0%	16.2%	18.4%
· Between 4,000 and 6,000 €	5.2%	11.9%	6.8%	4.1%
· More than 6,000 €	7.5%	6.8%	9.5%	8.2%
· Prefer not to answer	23.6%	15.3%	25.0%	28.6%
<b>Chocolate consumption</b>				
· Every day	15.63%	18.37%	10.32%	8.51%
· Once a week	15.63%	10.20%	15.08%	19.15%
· Two-three times per week	3.98%	12.25%	8.73%	12.77%
· More than four times per week	40.63%	46.94%	34.92%	36.17%
· Occasionally	18.75%	12.25%	30.95%	23.41%

670 **Source:** Authors' survey, 2019

671

672 **Table 2**

Type of chocolate	Description
Milk chocolate	It is obtained by adding at least 14% of powdered milk, no more than 55% of sucrose and no less than 25% of cocoa.
White chocolate	It is obtained by mixing 20% of cocoa butter, 14% of milk or derivatives, and no more than 55% of sucrose.
Extra-dark chocolate	The percentage of cocoa can exceed 45% of total weight.
Giandua chocolate	It contains about 32% of cocoa, 20-40 g of ground hazelnuts for every 100 g of product.
Dark chocolate	It contains cocoa paste, cocoa butter and sugar. The percentage of cocoa must be at least 43% and 28% of cocoa butter.
Aromatic	Chocolate with various flavourings, such as mint, vanilla, alcohol, etc.
Chocolate with added ingredients	Chocolate with dehydrated or dried fruits such as, oranges, strawberries, red fruits, etc. Chocolate with various cereals such as, puffed rice, oatmeal, etc. Chocolate with nuts such as hazelnuts, nuts, pistachio, etc

673 **Source:** Timms and Berger (2003); Baresani (2011)

674

675

676

677 **Table 3**

	Piedmont		Sicily	
	Women	Men	Women	Men
<b>Participants</b>	n=141	n=54	n=143	n= 55
<b>Chocolate preference</b>				
Milk chocolate	12.75	15.23	20.43	21.00
White chocolate	5.51	7.95	5.73	7.00
Extra-dark chocolate	15.36	17.22	15.77	23.00
Chocolate with nuts	17.97	9.93	18.28	19.00
Gianduia	16.13 <sub>A</sub>	15.89 <sub>A</sub>	15.94 <sub>B</sub>	11.00 <sub>B</sub>
Dark chocolate	14.20	16.56	8.24	9.00
Aromatic chocolate	2.90 <sub>A</sub>	3.97	0.72 <sub>B</sub>	1.00
Chocolate with dried fruit	4.93	4.64	3.58	2.00
Chocolate with cereals	10.43	7.95	10.39	7.00
<b>Chocolate formats</b>				
Bar	34.56	32.81	37.20	41.00
Assorted	17.43	17.19	15.70	13.00
Spreadable	16.21	17.97 <sub>A</sub>	18.77	13.00 <sub>B</sub>
Culinary preparations	6.12 <sub>B</sub>	7.03 <sub>A</sub>	7.85 <sub>aA</sub>	2.00 <sub>bB</sub>
Bakery confectionery	9.48	10.16	9.90	11.00
Fresh pastries	6.73	5.47	5.12 <sub>b</sub>	12.00 <sub>a</sub>
Ice cream	9.48 <sub>A</sub>	9.38	5.46 <sub>B</sub>	8.00

678 Values are expressed as percentages from frequency tables obtained from the survey. Different letters indicate statistical differences related to the  
679 genders from the same region (lower letter) and differences between regions within the gender (capital letter), using the least significant  
680 difference test ( $P < 0.05$ ).  $P$ -values were adjusted using Bonferroni's method.

681 **Table 4**

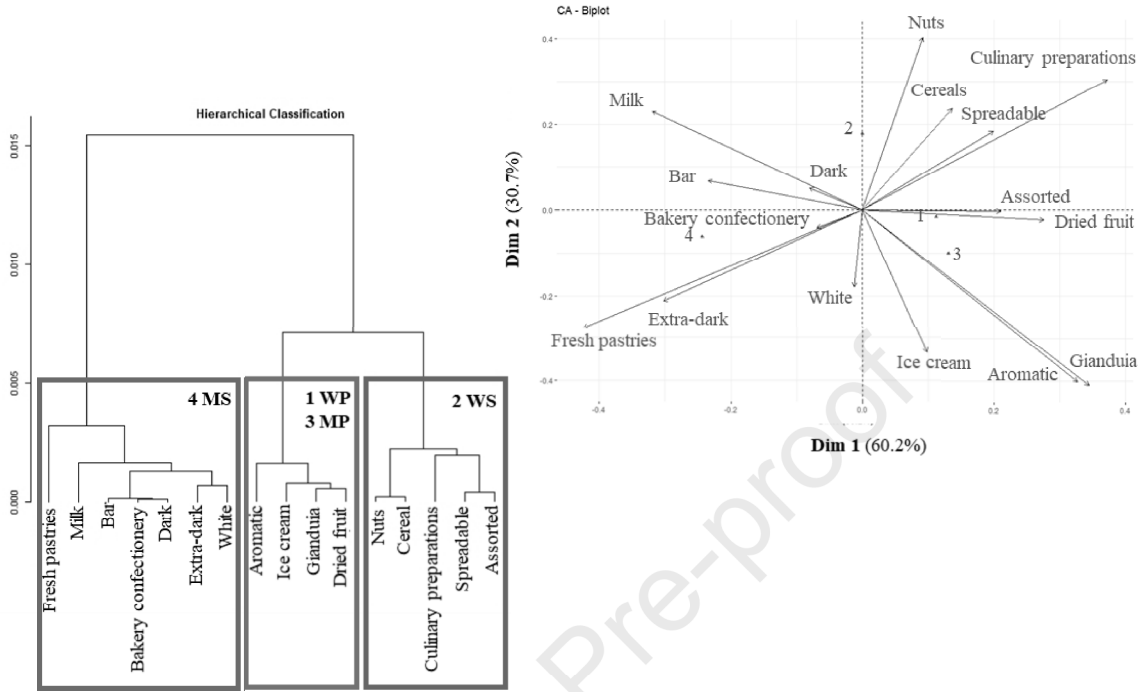
	<b>Women</b>		<b>Men</b>	
	Sicily	Piedmont	Sicily	Piedmont
<b>Frequency</b>				
Never	31.06	20.41	27.69	28.00
Sometimes	17.42	24.49	18.46	22.00
Rarely	24.24	18.37	26.15	32.00
Always	6.81	14.29	15.39	8.00
Often	20.35	22.45	12.31	10.00
<b>Items*</b>				
Cocoa quantity	43.36	41.84	49.09	51.85
Fair-trade certification	25.17	27.66	23.64	31.48
Environmental certification	5.59	11.35	9.09	14.81
Ethical disclosure	5.59	9.93	7.27	11.11
Nutritional facts	49.65	42.55	52.73	50.00
Precautionary allergens claim	11.19	6.38	10.91	11.11
Organic certification	4.20	3.55	5.45	3.70
Functional claim	2.10	1.42	3.64	5.56
Vegan statement	0.00	2.84	0.00	0.00

682 **Source:** Authors' survey, 2019. \* Multiple choice responses were allowed

683

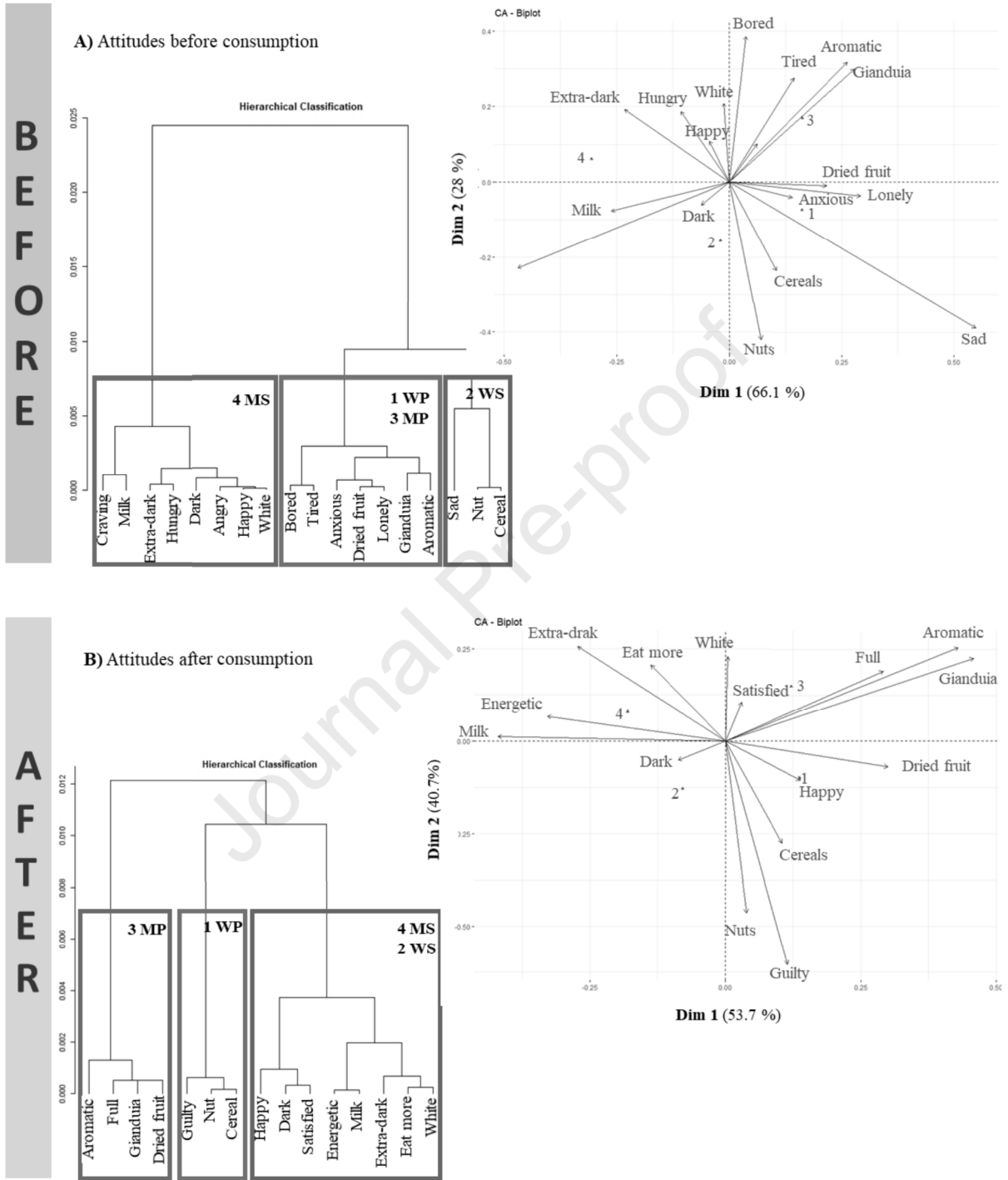


684 **Figure 1**



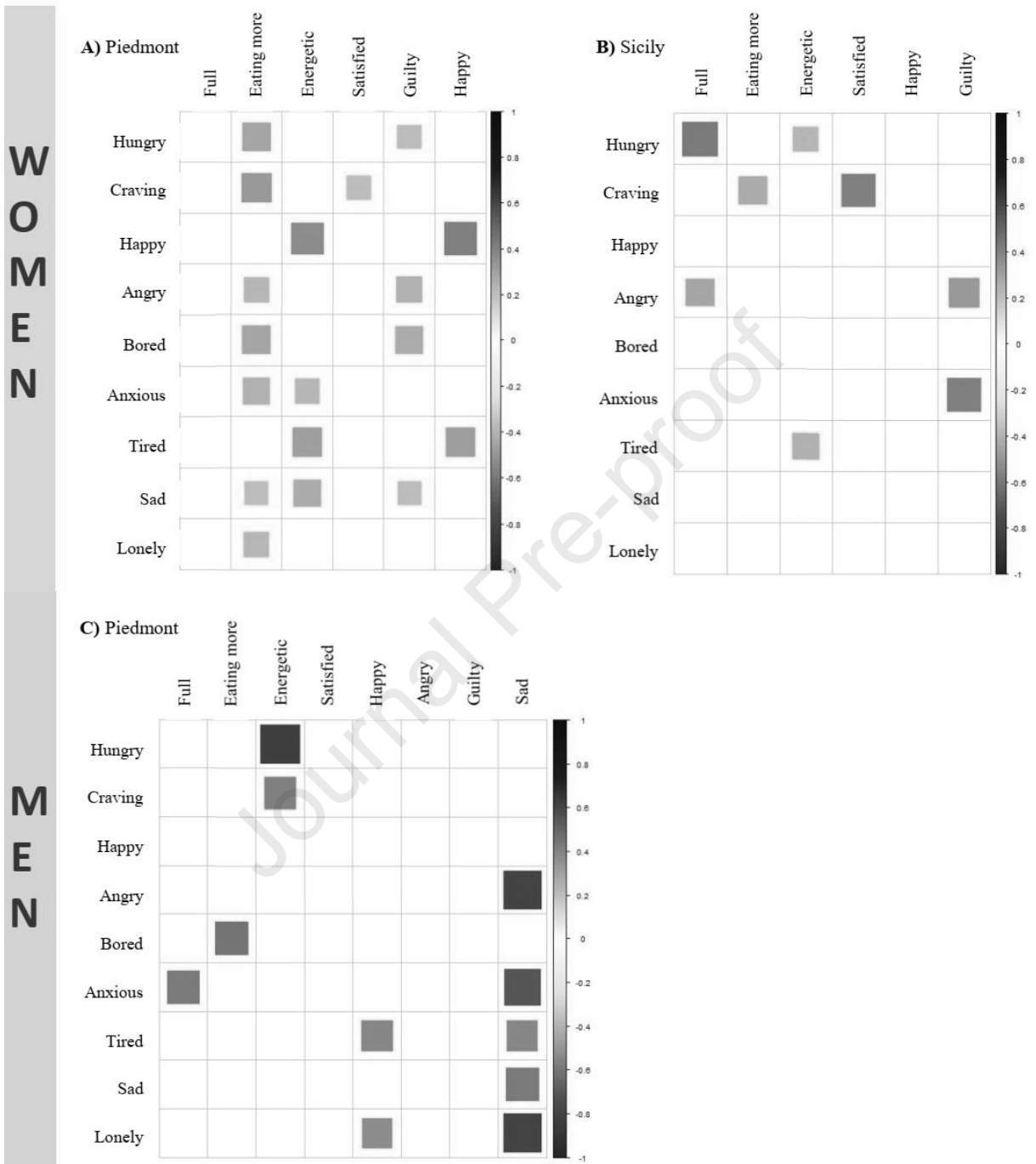
685

686 **Figure 2**



687  
688

689 **Figure 3**



690

Journal Pre-proof

## Highlights

- The most highly preferred chocolates in Italy are dark and extra dark
- Chocolate induces different pre- and post-consumption emotional states
- Emotional connotations emerged depending on individual's gender and origin
- Geographical affiliation and gender influence chocolate choices
- The emotional connotation of male' chocolate consumption merits further assessment

## **Chocolate culture: Preferences, emotional implications and awareness of Italian consumers**

### *Implications for gastronomy*

The chocolate market in Europe is constantly growing, and the offer is characterized by a widely differentiation of products on the market. Socio-demographic and lifestyle factors have been shown to influence the motivations for choosing emotional foods, such as chocolate desserts, and the composition of individuals' dietary plans. This paper analyzes the preferences and emotional connotations of Italian consumers towards different chocolate types and assesses which information on the label the consumers consider in the purchasing process. The results were based on a choice experiment comparing two geographical areas and woman and men in the chocolate consumption preferences, behavior and emotional experiences. Our results showed how the individuals' characteristics, in particular the gender, previous purchasing, motivation and consumption experiences are factors that influence chocolate consumption. In addition, the emotions that encourage and result from chocolate consumption depend of consumers' gender and the geographical area. In general, also the attention towards label claims depends by individuals' features that, however, were shared by a higher attention to the cocoa quantity and nutritional information followed by the fair-trade certification in the chocolate label. Our findings provide an empirical basis to inform the chocolate industry about the consumer attitudes towards chocolate, raise awareness of the social dimension in food labeling and provide a baseline for choosing a marketing communication strategy considering emotional claims. In addition, this research addresses the question of how the chocolate distribution (Ho.re.ca, large retail chains and producers) can create a sensory and emotional experience considering the individuals characteristics.