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Quality Factors Influencing Consumer Demand for Small Fruit by Focus Group and Sensory Test

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ABSTRACT

The market of berries is a niche of high value in Italy. Small fruit's healthy properties are well known in the international market, but little is known about the reason for a low commercialization rate of fresh small fruit in Italy. The objective of this study was to assess consumer preferences in Italy for selected berry species. Moreover, the study aims to identify the relevant attributes of berries that affect the demand for this produce according to consumers and to compare these attributes. We assessed relevant attributes affecting the demand for fresh berries for different consumers' profiles and compared berries' attributes rankings. The results reveal high concordance between blackberries and raspberries; price is the attribute that constrains more purchases because it is deemed too high. Consumers prefer small fruit because of the rising interest in their nutraceutical value, and they have a higher willingness to pay because of this important attribute.

KEYWORDS

Consumer segmentation; focus group; niche market; sensory quality; Spearman coefficient

Introduction

Small red fruit is universally known as a produce characterized by small shrubs, which reach a limited development also in the phase of maximum growth (Bounous, 1996). These fruits, within the genus *Vaccinum*, *Rubus*, *Ribes*, and *Fragaria*, naturally grow in the undergrowth of mountain and hill areas (Darrow G., 1996). This produce now is widely grown in greenhouses located in temperate zones, thanks to the introduction of new varieties (and genotypes) from other countries (Hancock et al., 2002) and the developing of cultivars that successfully meet the needs of the marketplace (Hall, Stephens, Stanley, Fin, & Yorgey, 2002). Several papers describe the healthy value of berries, given their high nutraceutical value and nutritional properties, which justifies a rising interest of the pharmaceutical and agro-food industry worldwide and, at the same time, a need for better cultivars (Finn, Moore, & Kempler, 2008; Wang & Lin, 2000).

However, berries are one of the most fragile and perishable fruits, both in harvesting and post-harvest, having a very short shelf life of 2–3 days, for

some species, or up to 5 days for others, which can be greatly reduced by storage temperatures above 0°C (Seglina, Krasnova, Heidemane, Kampuse, & Dukalska, 2010). In Italy, small fruits include the following species of berries: blueberries (*Vaccinium myrtillus* L.), blackberries (*Rubus fruticosus* L.), raspberries (*Rubus idaeus* L.), black currant (*Ribes brunum* L.), gooseberries (*Ribes uva-crispa* L.), and, occasionally, strawberries (*Fragaria vesca*) and brambles (*Rubus ulmifolius*) (Ciesielska & Malusà, 2000).

The most recent official domestic statistics state that (ISTAT, 2011) 402 hectares of land in Italy are cultivated with berries, and total production is 27,900 tons (72% of this is raspberries), with an increase of 28.2% from 2005 to 2010.

Although it is no longer a unique heritage of mountain areas (Beccaro et al., 2002), within the Italian sector of fruit production, small fruits are a niche produce. Nevertheless, in recent years, consumption of fresh berries has continuously increased, and official statistics demonstrate that Italy imports some varieties from other countries (INEA, 2013).

Moreover, despite berry perishability and short shelf life, which may cause high production costs and limitations for marketability, local farmers could introduce this crop to gain extra income by diversification (Marengoni, 1989), especially in some rural areas of southern Italy that are economically disadvantaged (such as the Sicily region).

However, small fruit is still poorly commercialized in Italy, compared to other countries, notwithstanding the increasing interest of consumers in this produce. Therefore, this research has the aim to assess consumer(s) preferences regarding small fruits in Italy and to find out key variables (i.e., intrinsic and extrinsic attributes) that may influence consumers' purchasing behavior in the domestic market.

Over the last few years, some studies have been conducted to know Italian consumers' behavior concerning small fruits' consumption (Crescimanno, Farruggia, Galati, Ingrassia, & Siggia, 2014), but a comprehensive approach to assess the preferences of Italian consumers in regard to small fruits and to know the reasons of their purchasing choices is still lacking. Certainly, surveys can be developed later to assess correlation between preferences of a larger sample of consumers, and this study is just a first part of a larger study that aims to find solutions to increased demand for small fruits and to improve supply in Italy.

According to the above premise, the first hypothesis of this study (H1) is that Italian consumption is poor because of low consumer acceptance of intrinsic quality attributes of small fruits (such as sensory and nutritional attributes). The second hypothesis (contrary hypothesis: H2) is that, despite adequate consumer acceptance of the intrinsic attributes of berries, consumption in Italy is poor for other reasons that should be verified, such as high price, scarce availability in the market, short shelf life, and origin of product (i.e., country of production).

Following these assumptions, the objectives of this study are: (1) to assess consumer preferences for some selected small fruits, based on quality attributes of berries; (2) to know the most relevant factors that affect, positively or adversely, berries' demand; and (3) to measure association between rankings of quality attributes for the selected berries. These objectives may help to have a first understanding of berries' market demand and consumption dynamics in Italy.

Materials and methods

A focus group (FG) research method was used to develop an understanding of consumers' preferences influencing purchasing behavior. Qualitative research methodology has proven to be an effective method for gathering information about food choice processes among adults (Falk, Bisogni, & Sobal, 1996; Newmark-Sztainer et al., 1999). According to Morgan (1988), FG is the most appropriate methodology for qualitative studies, as it gives consumers the opportunity to see and to try a product; moreover, FG allows consumers to simultaneously discuss a product (Hennink, 2007). FG provides instant feedback in terms of consumer perceptions, opinions, and beliefs as well as in terms of purchasing behavior. FG is used for data collection to promote idea generation via group interaction (Betts, Baranowski, & Hoerr, 1996; Krueger, 1998). FG structure must be well defined; although participants do not know each other, they must have some common interests to interact on the topics of discussion (Chironi & Ingrassia, 2010). Because of the above, FG was applied in this study with some variations to the ordinary model, to assess, besides consumer preferences, the possibility to modify consumers' hedonic evaluation of small fruits by the use of communication and to increase their acceptance.

Study design

Segmentation criteria

For this study we focused on specific profiles of consumers. For obtaining the profiles one of the most used model for segmentation of consumers was applied (see segmentation criteria (Table 1), according to illustrious literature (Kotler & Keller, 2009). Precisely, according to Kotler and Keller (2009), target marketing requires that marketers (at first step) identify and profile distinct groups of buyers who differ in their needs and preferences (market segmentation). A market segment consists of a group of customers who share a similar set of needs and wants; we can characterize market segments in different ways. One way is to identify *preference segments*. Homogeneous preferences exist when all consumers have roughly the same preferences (the market shows no natural segments). At the other extreme, there are consumers with diffused preferences, who vary greatly in their preferences. The

Table 1. Segmentation variables selected and criteria applied.

Variable type	Description	Var select	Criteria applied
Geographic variables	Different geographic units (nations, states, regions, countries, cities, density, etc.)	1. Geog. Region; 2. City size; 3. Density; 4. Climate;	1. North, Central, South and Islands; 2. City over 400,000 3. Urban; 4. Northern, Central, Southern;
Demographic variables	Age, life-cycle stage, gender, income, generation, social class, education, etc.	1. Age; 2. Family size; 3. Family life cycle; 4. Gender; 5. Income; 6. Occupation; 7. Education; 8. Social class.	1. (20 - 29), (30 - 39), (40 - 49), (50 - 59), (60 - 69), (70 - 79); 2. 1, 1 - 2, 3 - 4, 5 and more; 3. Young single; young, married, no children, children; older, married, single; 4. Female, Male; 5. 10.000 - 20.000, 20.000 - 30.000, 30.000 - 40.000, over. 6. Professional, managers, officials, proprietors, operatives, retired, students, homemakers, unemployed; 7. High school graduate, college graduate, over; 8. Upper lowers, working class, middle class, upper middles, lower uppers, upper uppers.
Psychographic variables	Psychological/personality traits, lifestyle, values, etc.	1. Psychographic lifestyle; 2. Personality.	1. Culture-oriented, sports-oriented, outdoor-oriented; 2. Compulsive, gregarious, authoritarian, ambitious.
Behavioral variables	Decision role, occasions, benefits, user status, usage rate, attitude, etc..	1. Behavioral occasions; 2. Benefits; 3. User status.	1. Regular occasion, Special occasion; 2. Quality, economy, usage rate; 3. Fruit consumer.

base for segmenting consumer markets is to look at characteristics (Wedel & Kamakura, 1997). For explaining fruit consumption many characteristics (variables) may play an important role—for example, descriptive (geographic, demographic, and psychographic) and behavioral (responses to benefits, use occasions, brand, etc.). Then, *association* between characteristics or consumer responses may be searched (Dillon & Mukherjee, 2006). Basing on this segmentation we found six profiles of consumers, which were identified with fancy names; see profile categories in Table 2.

Reference population

To select participants for FGs, it was chosen as reference population the members of nautical clubs and cultural associations in Milano, Roma, and Palermo, this population being suitable for our study because inhomogeneous by geographic, demographic, psychographic, and behavioral characteristics of people. The Chamber of Commerce provided the list of all nautical clubs and cultural associations in each of the selected cities. From these lists we extracted one club and one association for each city, using the probabilistic sampling method (Imbens & Lancaster, 1996). We contacted the extracted clubs and

Table 2. Profile characteristics.

Name	Demographic	Psychographic	Behavioral
Sapphire	age (20–30), male, living with parents, young single, low income, unemployed, Ph. D, upper lowers	sports-oriented, ambitious	healthy/probiotic feeding
Diamond	age (30–40); one female, one male, living alone, single, middle income, freelance and public servant, college graduate, working class	one sports-oriented and one outdoor-oriented, authoritarian	buyer, regular food feeding
Pearl	age (40–50), one female, one male, married living with family (children), middle income, freelance and housewife, some college, middle class	one sports-oriented and one culture-oriented, authoritarian and gregarious	buyer, healthy food feeding
Emerald	age (50–60), one female, one man married, living with family (children), college graduate, business owner and manager of public administration, high income, upper middles	one sports-oriented and one culture-oriented, gregarious and compulsive	buyer, regular food feeding
Amethyst	age (60–70), male, married, living with wife, over graduate, retired, high income, lower uppers	sport-oriented and culture-oriented, ambitious.	buyer, healthy/probiotic food feeding.
Ruby	age (70–80), female, living alone, graduate, retired, high income, upper uppers	culture-oriented, ambitious	buyer, regular food feeding

Sample size: $n = 54$ participants. Feeding: Healthy, Ordinary, Probiotic.

associations and explained the purpose of this research, finally obtaining permission to contact their members for the FG (if the club or the association refused to participate in this study, we extracted randomly another one from the list). Because of the inhomogeneous population, we divided it into six homogeneous strata based on the predefined segmentation criteria (Wilcock, Pun, Khanona, & Aung, 2004). Finally, we extracted the individuals (by probabilistic method) from each stratum of the population, excluding, from time to time, those who do not respect, simultaneously, all the predefined criteria (Trost, 1986) and who do not accept to be included in the FG. Therefore, the samples reflected the population composition and the predefined segmentation.

Selected attributes and fruits

In accordance with the literature (Espejel, Fandos, & Flavián, 2007) the concept of *quality* for fresh fruit can be analyzed under two different perspectives: *objective quality* and *subjective/perceived quality*. According to some authors (Bernués, Olaizolab, & Corcoranc, 2003; Oude Ophuis & Van Trijp, 1995; Steenkamp, 1997), it is possible to classify the subjective/perceived quality of a food product into two groups: quality of *intrinsic attributes* (e.g., visual appearance, color, flavor, taste), and quality of *extrinsic attributes* (e.g., price, packaging, country of origin). Table 3 shows the intrinsic and extrinsic attributes selected for this study (including sensory attributes). The small fruits chosen for this study were blueberries, blackberries, raspberries, and wild strawberries because they are the most commercialized in Italy.

Table 3. Variables.

Intrinsic variables			Extrinsic variables
Sensory variables	Objective variables		
1. Visual appearance	5. Nutritional value		6. Rate of usage
2. Odor			7. Price
3. Texture			8. Country of production
4. Taste/Flavor			

Description of Focus Group

FG was designed with a number of nine individuals. We focused our study on three very different cities in order to investigate differences in behaviors among geographic zones (northern, central, and southern Italy) in two different times (May and June 2014). Six FGs were carried out in three Italian cities: Milano, Roma, and Palermo. The first three FGs were organized in May 2014 (one in each city) and the other three in July 2014. We selected nine persons for each focus group; therefore, we had a sample of 54 consumers.

A moderator (a psychologist at the University of Palermo and expert in communication sciences) facilitated group discussion and monitored group interaction. A co-moderator participated in the FG; the co-moderator was an expert on nutritional and organoleptic properties of small fruit (PhD competences) with strong competences in post-harvest quality and minimal processing. The role of the co-moderator was to provide information about berries' nutritional qualities and eventually about their ability to provide extra health benefits (as, for example, a nutraceutical product) (Finn et al., 2008); moreover, he gave clarifications about any related questions. All moderators received training in focus-group implementation from the authors, following Krueger's (1998) advice for focus group research.

Each FG was carried out in a separate room of the extracted clubhouses, previously prepared, and run for 2 hours. Participants were invited to sit down at a round table so that no one had a leadership position that could influence the opinion of other participants. The topics of discussion were explored in an interactive setting group where participants were able to express their opinion spontaneously and freely. FGs were audiotaped, and tapes were transcribed verbatim to ensure systematic analysis of the discussion (Krueger, 1998). A *sensory test* was carried out during the first session of the focus groups.

Topics

Topics to be discussed by focus groups were developed by the research team (Newmark-Sztainer, Story, Resnick, & Blum, 1998). Members of other FG research teams, at the University of Palermo, reviewed questions for content and understandability. A semistructured questioning route was used in the focus groups to ensure consistency in questions asked across groups, yet to

allow for some flexibility in accordance with topics raised and level of participation within the group (Krueger, 1998). Questions were aimed primarily at assessing preferences for each small fruit and then their consumption behaviors. To help participants think about reasons influencing their preferences for small fruit and to help them give their responses with concrete examples, and also to encourage independent thinking before group discussion, participants were first asked to read cards, with pictures and written text, showing each berry, some characteristics (e.g., zone of production, maturing time), and potential ways to use and occasions of consumption (garnish dishes, confectionery and sweets, yogurt, mousses, etc.).

The lineup of FG included three steps by which to assess the following preferences or information, which are:

- (1) Sensory test, sensory preferences, and description of nutraceutical value of the berries;
- (2) Reasons for regular consumption or not;
- (3) Findings and suggestions.

At the end of each step, participants were required to fill in one part of a personal questionnaire (Type One questionnaire) properly prepared for this test, to note their opinion on the question/theme object of discussion. After the participants had carried out the three steps and filled in the three parts of the questionnaire (i.e., sensory attributes, consumption attributes, findings, and suggestions), the moderator asked them to share what they had written, focusing primarily on their selection and preferences. Finally, the moderator started the final FG discussion, and at the end of it, a leader, chosen by participants, filled in the group's questionnaire (Type Two questionnaire) with the unique preferences of the group.

Questionnaire

Two questionnaires were prepared for this study: Type One for single participant answers and Type Two for FG unique opinion. Each questionnaire was divided into two parts: the first part was structured to collect information about each respondent's opinion in regard to the sensory variables of small fruit selected, and the second part was structured to collect information about opinions with reference to other variables (i.e., extrinsic attributes: rate of usage, price, country of production) and intrinsic qualities (i.e., nutraceutical components).

In addition, both questionnaires were properly structured to collect information about all the topics discussed: respondents were requested to describe their purchasing behavior, to say reasons for buying and places of purchase, to declare their willingness to pay for this product (i.e., hedonic price), and

occasions of consumption and willingness to consume wild strawberries as a substitute of other berries. To help respondents easily provide homogeneous answers as fast as possible, questionnaires contained multiple-choice closed answers; for the hedonic price the questionnaire presented price ranges. Moreover, in both questionnaires it was required to rate six quality attributes (i.e., qualitative variables) using a 6-point Likert scale (where 1 is the lowest score and 6 is the highest score) according to expressed preferences. The chosen quality attributes for this test were (Sortino, G., Allegra, A., Inglese, P., Chironi, S. & Ingrassia, M. 2016):

- (1) Visual appearance;
- (2) Odor;
- (3) Texture;
- (4) Taste/flavor;
- (5) Occasion of consumption (i.e., ease of use);
- (6) Nutritional properties (Table 3).

Sensory test

Perfect visual appearance of produce has been the one of the major agronomic objectives of fruit growers until now (Mezzetti, Capocasa, & Scalzo, 2002). Undoubtedly, perishability is an important consideration in food choice, as people want to buy food that will last as needed (Morgan et al., 2016). Consumers expect fruit to look great and taste great because they use color and firmness to infer freshness and associate it with taste, perishability, and healthfulness (Morgan et al., 2016). Further, they are increasingly aware fruit should give health benefits (Sortino, Ingrassia, Allegra, & Inglese, 2015). Because of this, a guided tasting was carried out first to know participants' sensory preferences about the following *sensory attributes/parameters* (Table 3): (1) visual appearance; (2) odor; (3) texture; and (4) taste/flavor. Throughout the tasting, the comoderator explained, from time to time, organoleptic properties, nutritional value, and health benefits of each small fruit. Meanwhile, the moderator wrote down participants' opinions in regard to each small fruit, before and after having been informed about fruit characteristics, to assess communication's effectiveness on hedonic evaluations.

Statistical data analysis

A systematic analysis of the FG discussion was carried out following Krueger's instructions (Krueger, 1998) using tape transcriptions verbatim. Results of the FG discussion were described and discussed together with those coming out from data collected by the questionnaires. Moreover, as for the six qualitative variables to be rated by participants, the frequencies of scores given by consumers were calculated, and the total score of each

Table 4. Variables' Rankings for all berries.

N.	Variables	Berry varieties			
		Blueberry	Blackberry	Raspberry	Strawberry
1	Visual appearance	4	2	1	4
2	Odor	6	4	5	1
3	Texture	1	5	4	6
4	Taste and flavor	2	3	3	3
5	Occasions/Easiness of use	5	6	6	2
6	Nutritional value	3	1	2	5

attribute for each small fruit was calculated as the sum of all the ratings given by participants. These scores were compared to the maximum score obtainable (6 points \times 54 participants = 324 points) to highlight the order of preference among variables for each small fruit. In case of equal scores between two variables, the final ranking was based also on information obtained with the FG's discussion on the specific variables.

Having obtained the rankings of variables for each small fruit (Table 4), the association between couples of small fruits was measured using the rank correlation coefficient of Spearman. The coefficient ρ_s (*Rho*) of Spearman was applied because it is a robust and efficient estimator in case of ranks (Croux & Dehon, 2010; Zar, J. H., 2005), and it is one of the coefficients most commonly used to measure the association between two ranks of attributes (qualitative variables) and to know the direction of the association (Masson et al., 2003; Matthys et al., 2004). The measure and the direction of the association between ranks of attributes of couples of small fruits may provide information about similarities between fruits or dissimilarities, according to consumers, and therefore provide information about similarities of preferences for small fruits. The correlation of ranks introduced by Spearman is one of the oldest and best known of nonparametric procedures for studying ranks of preferences (in qualitative studies). The rank correlation coefficient, ρ_s (*Rho*), is generally expressed as $\rho_s = 1 - 6 (\sum d^2 / (n^3 - n))$, where n is the number of measurements in each of the two variates in the correlation, $\sum d^2 = \sum_{i=1}^n d_i^2$, and d_i is the ranked difference between the i th measurements for the two variates (Zar, J. H., 2005).

Results and discussion

Results

FG results showed a general consumer satisfaction with respect to the variables considered. The expert support contributed to enliven the discussion and to make consumers more aware in replying. The hypothesis H0, that he considered the nonacceptance of berries by consumers, was rejected. Consequently, H1 was accepted, and the reasons for small commercialization are the low quantities of product available and the high price.

Sensory test

Analysis of data showed the following results of preferences for each small fruit.

- (1) *Visual appearance*: Raspberries had 92.59% of the maximum score obtainable (max s.); blackberries 85.19% of the max s.; strawberries 74.07%; and blueberries 68.52%.
- (2) *Odor*: Strawberries had 98.15% of the max s.; blackberries 75.93% of the max s.; raspberries 74.07% of the max s.; blueberries 46.30% of the max.sc.
- (3) *Texture*: Blueberries had 88.89% of the max s.; raspberries 75.93% of the max s.; blackberries 70.37% of the max s.; strawberries 53.70% of the max s.
- (4) *Taste/flavor*: Blueberries 87.04%; blackberries 85.19%; raspberries 83.33%; strawberries 77.78%.

FG topics

Analysis of data showed the following results for each small fruit. The FG discussion showed consumers' satisfaction with respect to the intrinsic attributes considered. It was noted that the presence of the expert who explained the nutritive and organoleptic characteristics of each fruit contributed to enliven the discussion and to make consumers more aware in replying.

In particular, as for point 1, sensory test, sensory preferences, and description of nutraceutical value (Finn et al., 2008) and nutritional characteristics of the berries, it was found that the raspberry was the most appreciated, both as regards the *visual appearance*, obtaining 92.5% of the maximum score attributed (max s.), the *nutritional properties*, obtaining 83.3% of max s.—participants were informed about the content of antioxidants and about the anti-inflammatory properties of the fruit (due to the presence of polyphenols and tannins)—and also the taste, 81.4% of max s. This opinion was expressed unanimously among participants.

The blackberry received 87% of the max s. for the variable *nutritional properties* because consumers were fully informed that this fruit contains the highest content of vitamins (C, E, and F) and minerals salts and that the color (dark red) depends on the content of anthocyanin (making it rich in anti-inflammatory properties). In addition, consumers have expressed very high ratings also with regard to *taste* and *visual scores*.

The strawberry was the fruit with the easiest occasion of using, getting 94% of the max s., because, according to the respondents, this fruit is easier to be found on the market at any time of year. In addition, the strawberry was the fruit with the most intense perfume, having obtained the variable *odor* the highest percentage of max s. (98%).

The blueberry was the fruit with the best sensory characteristics from the standpoint of *taste* and *texture*: the flesh is crisp and juicy, a balanced mix of sweet and sour flavors. But also *visual appearance*: the rounded shape and the deep blue color were particularly attractive. On the other hand, this fruit has received lower ratings on the variable *odor*.

No significant differences have been found between responses of members of defined profiles or between genders, except with regard to the topic of nutritional properties. In fact, the profiles of younger and sports-oriented consumers are similar to those of the more elderly consumers, more concerned in regard to food for health problems.

Concerning point 2, reason for consumption or non-consumption regularly, as for variable *rate of usage*, the strawberry was the fruit with the highest score, 94.44% of max.sc. for this variable; raspberry 72.22%; blueberry 66.67%; and blackberry 62.96%. With regard to issues related to the distribution, consumers emphasized the difficulty of finding in the market small fruits but especially blueberries and blackberries. The strawberry is the fruit always available on the market, for this reason it is considered by consumers as a substitute of berries at any time. Consumers said they buy, often, frozen small fruits to prepare pastries and sweets in place of fresh fruit. For the variable *price* observed a gap was observed between *hedonic price* and market price that is deemed too high.

Finally, as regards point 3, findings and suggestions, participants said that the country of production is very important; they think that small fruit produced in Italy or in Europe are preferred to those produced in non-European countries. Consumers say it is very difficult to find small fruit at supermarkets or retailers.

Spearman coefficient

The results of the focus group discussion were confirmed by the application of the Spearman correlation coefficient. In fact, comparison of ranks of variables for couples of small fruits revealed a low concordance between blackberry and blueberry (0.145) and between raspberry and blueberry (0.371). A strong concordance is found between blackberry and raspberry (0.886). Wild strawberry has an inverse association with all the other fruits: blueberry -0.829 , raspberry -0.543 , blackberry -0.314 , i.e., an inverse relation between scores given to variables for strawberries compared to other small fruits (Table 5).

Table 5. Spearman coefficients for couples of berries.

Berry varieties	Berry varieties		
	Blueberry	Blackberry	Raspberry
Blueberry	//	/	/
Blackberry	.143	//	/
Raspberry	.371	.886	//

Discussion

According to the six focus groups, consumers are aware of the health value of small fruits, but their knowledge is confused and generic. Thanks to the expert who explained differences among berry varieties, participants were able to distinguish different nutraceutical components of each fruit. More particularly, the content of mineral salts, anthocyanin, and vitamins (C, E, and F) were very appreciated for blackberries, but the content of antioxidants, polyphenols, tannins, and anti-inflammatory properties were appreciated for raspberries. The nutritional and organoleptic characteristics of blueberries, blackberries, and raspberries appeared the most important ones, because consumers ranked them very often in the first three places (Table 4). Moreover, consumers said the best way to eat berries would have been in a mix, to benefit from all their different taste and health components.

Moreover, consumers' acceptance of sensory attributes of small fruits was high, and *taste* was rated as being a very important factor for small fresh fruits; this finding is very important, and it is consistent with existing literature that showed the high importance placed on taste has an influence on food choice (Biloukha & Utermohlen, 2001; Glanz, Basil, Maibach, Goldberg, & Snyder, 1998; Lennernäs et al., 1997; McCrory, Saltzman, Rolls, & Roberts, 2004). So FG participants said that berries might be also a substitute of local seasonal fruit.

More particularly, with regard to *sensory variables*, the raspberry has obtained the highest number of maximum scores with reference to *visual appearance* (92.59%), the strawberry with reference to *odor* (98.15%), and the blueberry with reference to *texture* (88.89%). These results are in line with previous research on fresh berries' postharvest quality and preservation that shows how, despite strawberries and raspberries being very perishable and having a very short postharvest life, color, appearance, and odor are the sensory qualities with slower decay, compared to the other parameters (Van der Steen, Jacxsens, Devlieghere, & Debevere, 2002; Han et al., 2005). Further, blueberries are also consistent with previous literature on sensory evaluations by panelists with regard to texture. In fact, though all fruits had the lowest scores for texture (Saftner, Polashock, Ehlenfeldt, & Vinyard, 2008), blueberries were the most appreciated fruits among all species tested for this parameter (Rodriguez & Zoffoli, 2016), having obtained the first position in the ranking (with 83.33% of maximum scores).

Particular attention requires variable *taste/flavor*: similarly, for all berries, results show high percentages of maximum scores (blueberry, 87.04% of maximum scores; blackberry, 85.19% of maximum scores; raspberry, lower scores for strawberry with 77.78% of max.sc.); these results are aligned with others of Almenar, Samsudin, Auras, Harte, and Rubino (2008) about shelf life of blueberries and confirm that taste is a primary driver of purchasing choices for food (Kourouniotis et al., 2016).

Although sensory attributes of small fruits vary according to species and varieties, a number of similar characteristics were found among the species chosen for this study, according to FG participants. Specifically, concerning all variables, consumers think that blackberries are very similar to raspberries—this is confirmed also by results of Spearman coefficient (very high association of 89% or 0.886). Other similarities were highlighted between raspberries and blueberries (association of 37%) because consumers evaluated with same scores *odor*, *taste*, and *nutritional properties* and between blueberries and blackberries (association of 14%) for *taste* and *nutritional properties*.

With regard to the market, the consumer highlighted the scarce quantity of berries commercialized at supermarkets and at fruit retailers. On the contrary, strawberries are frequently available, and their rate of usage is very high as fresh fruit or for confectionery. Participants said they often buy frozen berries, because of the lack of fresh product due to a limited supply.

These results highlight that, although perception of food quality is a very relevant factor in food choice, consumption is often mediated by availability and affordability, and, in accordance to other studies (Morgan et al., 2016), this research provides evidence that high price and scarce availability are important factors negatively influencing consumption, more particularly when perishability is very high, as in the case of berries.

Finally, results showed that communication and information about the product may influence consumers' preference (Morgan, 1988) because participants gave a positive feedback in regard to occasions and rate of use as well as willingness to pay for this product after discussion with the moderator and the co-moderator.

Conclusions

Assessed preferences demonstrate a high consumer acceptance for small fruit sensory attributes, especially for *taste*, and other intrinsic attributes. These findings contradict the first hypothesis and accepted the second hypothesis; in fact, the reasons for a scarce commercialization are the limited supply and the high price of small fruit in Italy. Short shelf life is affected strongly by these variables. Findings may suggest internal programs to sustain this production, especially in such territories where product diversification could be helpful for income expansions of local farmers. Marketing strategies and communication campaigns may be effective to increase consumer's interest to this product.

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