



## Italian consumers' awareness, preferences and attitudes about Sicilian blood oranges (Arancia Rossa di Sicilia PGI)

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### ABSTRACT

The objective of the paper is describing the results of a survey on the consumer's awareness, preferences and attitudes of certified quality products such as fruit and vegetable, and in particular of Sicilian Blood Oranges (Arancia Rossa di Sicilia) which is PGI product. A total of 26 participants with heterogenous socio-demographic background took part in the study. The aim of the study was achieved using focus groups (FGs). Three sessions of FGs were held in September 2021 in three Italian cities chosen as a convenience sample to represent the entire Italian territory. The results show that fruit and vegetables have a particularly relevant role in the eating habits of the sample. For the interviewees, the quality label of food products is a guarantee of being Italian, of compliance with production norms and standards, of natural and genuine products and of a more intense and good taste and flavour. For the whole target, Arancia Rossa di Sicilia PGI is a premium product of reliable excellence and whose quality can be assured because it is certified, as long as the consumer recognizes the certification logo on the product.

### 1. Introduction

In the last decades, consumers concern about food safety, food quality [1] and their consciousness about environmental sustainability issues have triggered various practical consequences in consumers' preferences and attitudes. In particular, new system of values raised that guide consumer choices, whose distinctive features consist in three main profiles: sustainability, food safety and quality.

Regarding the first profile, to date, food systems are responsible for a number of environmental problems, such as anthropogenic greenhouse gas emissions, environmental and biodiversity degradation, soil erosion, water scarcity, resource depletion, and others [2,3] that determine the phenomena of pollution and global warming, well known to consumers today [4]. Consumers, in fact, pay attention whether manufacturers follow the sustainable food production patterns [5].

Regarding food safety, the awareness that the type of food impacts human health [6] steers consumers increasingly demanding in their choices. The number of food scandals and incidents that are continuously happening without any sign of decrease [7,8] raise food-borne illnesses worries. EU attention about this topic is great. There are several regulatory measures and among them Regulation 178/2002 has

set the general principles and requirements of food law and procedures in matters of food safety and it serves as a cornerstone. Among other things, it has established the European Food Safety Authority (EFSA) which provides scientific advice and scientific and technical support in all fields with a direct or indirect impact on food safety.

Besides, the interest in staying healthy constitutes, for adults, a driver for fruit and vegetable consumption preferences [9]. In particular, consumers have high health and nutritional benefits expectation when consuming fruit [10].

The third profile, quality, is related to the second. In fact, serious concerns about food safety increase demands for quality assurance [11]. Consumers require precise information about product origin, valuing it a useful quality cue [1].

The specific characteristics of certified quality products meet the outlined three consumer needs having a strong regional identity influencing their attitude [12,13]. In fact, management conditions for certified quality food products meets all three environmental, safety and quality standards involving strict rules such as prescribed methods and techniques strongly linked to a certain place [14,15]. The fact that quality labelled products may respond to consumer demands in order that the supply side dedicates more attention to environmental, safety

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and food quality issues, suggests a possible predisposition of consumers towards such products and a possible increase in the relative demand. This assumption made it appropriate and interesting to develop an explanatory study on a particular quality product recognized by a specific brand, Arancia Rossa di Sicilia PGI, to investigate, through the qualitative analysis technique of the focus group (FG), awareness, preferences of consumers for specific attributes [16,17] and attitudes of consumers to draw useful information in the field of scientific literature and for professionals. This could be to the advantage of both the scientific literature and for workers in the sector. Hence, quality products may constitute a benchmark for consumers to ensure higher levels of traceability and food safety than other products [18] lacking information about their origin especially, in case of products processed and prepared in a particular geographical and environmental area. Some authors, in fact, have found that the guarantee of place of origin and production reduce consumers perception of risk involved in consuming the product [19] and that ethnocentrism is a factor that have influence on consumers' behaviour [20].

Such circumstances may lead to an increase in the consumption of products of recognized quality [21]. For this to happen, the knowledge of the quality mark of a food product and its characteristics by consumers is a prerequisite.

The choice to focus this research on Arancia Rossa di Sicilia PGI depends on the importance of this product within PGI scenario; in fact, it represents the 19% of the total economic value produced by quality labelled products in Sicily [22].

## 2. Quality schemes

### 2.1. Normative aspects

A quality scheme product is the result of a territorial specificity and it is a resource bearer of cultural and symbolic values that identify the product with the territory [23,24]. It helps the economy of the territory in a direct way through the profitability of the specific productive sector of the agri-food system, given its added competitiveness in the global market [25–27], but also indirectly through the activation of connected production segments.

However, specific studies doubt the contribution of PGIs to regional prosperity, because of certain harmful effects on rural development [28] and therefore PGI label alone does not seem to always lead to the success of a local initiative [29].

Some authors see in “traditional food” a producers' strategy for resisting competition from large corporations in the agro-food industry [30], in fact, in both national or export markets, local and typical products may be strong competitors [31]. The European Union has been attentive to these issues with the merit of creating a framework for quality certification, contributing over time to regulating and harmonizing the rules. A first normative act was Regulation (EEC) No 2081/92 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs. Subsequently Regulation (EC) No 510/2006 revised and repealed it on the same subject and then Regulation (EU) No 1151/2012, perfected and extended the whole quality schemes framework. Thus, for the protection of designations, the characteristics, the geographical origin of products and traditional production processes, the EU has identified the PDO (Protected Designation of Origin), PGI (Protected Geographical Indication) and TSG (Traditional Specialty Guaranteed) labels.

In order to provide tools to promote awareness and recognition of these schemes among consumers, Regulation (EU) No. 1151/2012 required that labels bear the European Union symbol and the product name (from 4 January 2016) for registered and marketed EU products.

Quality schemes' valorization may bring several advantages, including allowing to give relevance to the link between the quality attributes of the product, or its characteristics, and the geographical environment.

Quality product peculiarities result in a unique identity carrying an added value for agri-food products [32].

Certified goods are produced according to a specific Code of Practice, which specifies the production process for the good, its distinctive qualities, and the geographic boundaries of the production area, certifying that the product is “traditional” [33].

### 2.2. Consumers and quality products

The quality scheme system intrinsic value needs to be recognized by consumers to spread [34]. Some authors state that consumer awareness and comprehension of label information are crucial [18]. Since it seems that consumers generally tend to attribute higher quality to products with certification of origin [19,35] knowing quality labels may influence their decision-making process and their willingness to pay [36,37]. Thus, regarding PGI products, a research study found out that the impact on purchase intention only emerged when the relatively unrecognised PGI label was explained to consumers [38], reinforcing the crucial relevance of comprehension and awareness about the label system and the specific labelled products. Generally, quality labelled products have a higher price than conventional products. This circumstance may constitute a disincentive for some consumers to buy, while others may accept it because they recognize that the certification schemes involve many production and bureaucratic costs and, at the same time, they guarantee conformity to a socially responsible way of doing business [11]. However, this cannot be the case when consumers do not know the product [39] and, therefore, cannot correctly associate of certificated quality products characteristics to their respective labels [40]. It becomes compelling communicating the quality scheme value. Some studies confirmed that certain groups of consumers are willing to pay higher prices for local products [41,42] because of their numerous positive aspects including health profile, carbon footprint reduction and the experience of local culture, tastes and traditions [43–46].

The quality scheme branding may help increasing the market positioning of a food product to intercept new consumers interested in guaranteed and high-quality products. Within this context, this work aims to explore consumers' awareness, preferences and attitudes for Arancia Rossa di Sicilia PGI. Villari et al. [41] reported that the consumers in France recognize this Sicilian product as unique and inimitable because it is linked to a specific origin and so it results relevant to explore the Italian market.

This quality labelled food was recognized by the Commission Implementing Regulation (EU) n. 1117/2013 approving amendments to the specification of the name entered in the register of protected designation of origin and protected geographical indications. In particular, Arancia Rossa di Sicilia PGI is contained in Annex of this Regulation for the Italian category “Class 1.6 – Fruit, vegetables and cereals, fresh or processed”.

PGI is the label that identifies a product that originates in a specific place, region or country recognized for given quality, reputation or other essential characteristic attributable the geographical area where least one of the production steps taken place in the defined geographical area. So, the specific “production specification” (MIPAAF – Italian Ministry of Agriculture) [47] identifies the relative branding highlighting conditions, requirements, the production area and specific traditional quality characteristics. Thus, the sector has the potential to stimulate consumer's trust by the PGI guaranteed certification also thanks to the branding logo fixed directly on the oranges or on the packaging.

## 3. Materials and methods

### 3.1. Data collections

Qualitative research is considered a valuable approach for exploratory studies because it is flexible and adaptable to different contexts

[48]. It is a tool that can serve to explore a specific issue and its driving forces [49].

The qualitative approach has been widely adopted for research regarding the food sector. Numerous applications of this approach are reported in the bibliography in the preparatory analysis for the development of new food products [50], the study of consumer's perceptions [49] or the analysis of motivations related to food choices [51]. Focus Groups are a widely used tool by researchers using qualitative approaches, especially in food science [52]. In particular, among various qualitative research techniques, FGs are one of the most frequently used to develop the preliminary phases of a research study [53]. This technique is based on group dynamics guided by a principal investigator, whose mission is to encourage conversation through the exchange of views amongst the participants which eventually allows new ideas to emerge.

Krueger and Casey [54] defined the focus group as a carefully organized conversation to gain information about a specific topic. The participant is placed in a permissive, non-threatening environment and is encouraged to express reflections on personal experiences [55]. Participants are encouraged to converse with the principal investigator but may intervene and engage with other participants.

Thus, its main advantage over other more structured research methods, such as structured questionnaires, is that it allows and promotes greater freedom of expression amongst the attendees [49,56] and is a suitable technique for studies involving the identification of concerns and the development and application of new products or services [57,58].

Moreover, the focus group is a technique that facilitates the emergence of mindfulness as "a consciousness-raising exercise": interacting with other people on a topic that is part of everyday life facilitates focus on aspects that are often taken for granted and increases awareness, preferences or attitudes [59]. This condition makes the focus group instrument widely useable even for very familiar topics.

Within this context, three sessions of FGs were held in September 2021, in order to explore Italian consumers' awareness, preferences and attitudes about "Arancia Rossa di Sicilia PGI".

The number of sessions was defined when data saturation point was kept, defined as the point at which linking concepts of two consecutive focus groups revealed no additional information.

Each session was held in a different Italian city, by the same principal investigator and following the same procedure, according to the guidelines provided by the research team. The three cities involved are known to be useful samples for the representation of the Italian territory. The number of participants in each FG varied. First session was performed in Milan involving 8 participants. The other sessions were held in Rome and Bari involving respectively 9 participants for each city. So, the total sample was equals to 26 participants. As common for qualitative research, it was a convenience sample of participants available to carry out the FG [54,60]. They were accepted to participate through screening questions aimed at excluding from the sample those who do not consume oranges and do not know the quality brand products. All participants gave informed consent before taking part in the study.

### 3.2. Focus group structure

The focus group protocol consisted of open-ended questions that were designed to explore consumer preferences and attitudes for "Arancia Rossa di Sicilia PGI".

FG sessions lasted each approximately 2 h and the protocol used by principal investigator for all the session was subdivided into 5 sections (see Appendix A), including the first one for the "warm up" and the last one for the "conclusion".

The opening 5-min general conversation covered the introduction of the principal investigator, information about audio and video taping and GDPR compliance. The moderator reassures the participants and tells them that they must express their opinion: there are no right or wrong

answers.

The principal investigator started by explaining the framework of the research.

After the warm up, the other 4 sections were used to drive the discussion and fulfil the study objectives. The approach adopted was "from general to specific". In fact, the first question was about frequencies and criteria for purchasing all kind of fruits and vegetables. After that, quality label products were introduced generically to understand if participants knew their value and if they would choose them when they can.

It was not until the fourth section of the protocol that the principal investigator specifically mentioned "Blood Oranges" for the first time. This fourth section was subdivided into 4 sub-sections with specific aims to understand participants' attitudes and information. First of all, the principal investigator attempted to understand participants' purchasing habits for general Blood oranges and investigate their knowledge in reference to the quality labels associated with this product. After that, to help generate ideas, participants were shown the logo of "Arancia Rossa di Sicilia PGI" (Fig. 1) and prompted a specific discussion on this labelled product that was the subject of this exploratory study. Finally, in this same session an attempt was made to determine the value associated by participants to the PGI label in general and to determine a typical consumer profile for "Arancia Rossa di Sicilia PGI".

Lastly, before the conclusions, the principal investigator tried to understand possible advantages and disadvantages associated by participants to the consumption and purchase of "Arancia Rossa di Sicilia PGI".

To ensure credibility and accountability, at the end of each section, the principal investigator summarized the main points and asked participants to confirm or review this summary.

### 3.3. Focus group procedures

After defining the specific guiding protocol for the principal investigator, participants were invited to participate via a consumer database consisting of people who consume fruits and vegetables and consume and/or are familiar with PGI labelled products (not-rejecter).

When invited, the purpose of the qualitative research was not revealed to participants and the invitation was communicated as "discussing their attitudes for consuming and purchasing fruit and vegetables".

All sessions were conducted using the well-known Zoom platform, coordinated by the principal investigator of the session. Having to conduct the meeting online, participants were eligible to attend if they had an internet connection and their own device with a camera and microphone that would allow them to participate in the online meeting.

As common, in online mode, a focus group does not have the same constraints as in face-to-face: it is more challenging to keep the attention of participants in an online focus group [61].



Fig. 1. Logos of "Arancia Rossa di Sicilia PGI" and "Protected Geographical Indication".

We obtained good results by alternating individual presentations with shorter discussion periods.

Mesias, Martìn and Hernandez [49] report in the literature that for proper internal dynamics among participants in FGs a minimum of 6 people and a maximum of 12 people should participate in each session. In fact, other literature references report that if there are less than 6 people, group dynamics do not develop, while in groups with more than 12 people there are difficulties in conducting the conversation following the research objectives [56,62].

Moreover, we used an online platform with image and sound because we want to control also the bias due to the lower degree of interaction between the participants and the need for constant intervention by the moderator to guide the discussion. In fact, absence of physical contact, less perception of body language, potential distractions, constitute typical limitation for online groups) [63].

Fig. 2 shows the chart of the procedure followed to design and carry out the FGs.

Organizers contacted participants the day before their focus group session to confirm their attendance. Following the recommendations proposed by Tuttas [64] for focus groups conducted in a virtual environment, access keys to the Zoom platform were not sent to each participant until 1 h before the focus group session began.

People who do not know each other have been involved in the discussion to allow topics to be covered without any inhibitions due to previous encounters and/or relationships of daily interaction [54].

Three FGs were conducted in total and all of them were supervised by the same principal investigator. An observer was also present in each session to assist the principal investigator and manage the IT aspects of the online platform used.

All sessions were video recorded to accurately capture all responses. Subsequently, all info collected was promptly transcribed by the researchers to analyse the information provided for each session.

Prior to initiating registration, informed consent was obtained from

all participants. The principal investigator reassured participants by guaranteeing the anonymity of their answers and the impossibility of tracing the confidential information revealed by each participant. It is also important for the principal investigator to emphasize that, for the purpose of research, everyone's point of view is useful and that it is not necessary for everyone to agree.

The moderator, after asking the question, asks who wants to speak first and then asks the other participants to intervene in the discussion, going around the table.

At the end of the session, each participant told the principal investigator some socio-demographic information, such as age, education level, job, and number of family members.

To thank the participants, each of them was given an "Amazon voucher" worth EUR 25 as a reward for the cost of their time spent for the study.

### 3.4. Participant characteristics

Focus group recordings were first transcribed verbatim using the Microsoft Word® transcription function. Subsequently, all researchers listened to the recordings alongside the transcript file to ensure that Microsoft Word® accurately captured all the responses.

During the transcriptions, all personal identifiers, name or consumer interactions were removed from the transcripts to ensure participants' confidentiality.

A total of twenty-six participants took part in the FGs.

Following what has been reported in the literature, the number of participants involved in each session was between 6 and 12. In addition, an attempt was made to include a variety of people for each FG based on socio-demographic characteristics and their attitudes towards purchasing and consumption. Table 1 shows participants characteristics in the different FGs.

All FGs were balanced in gender. In total, about 54% of the sample were female. Participants' ages ranged from 27 to 66 y. o., although the

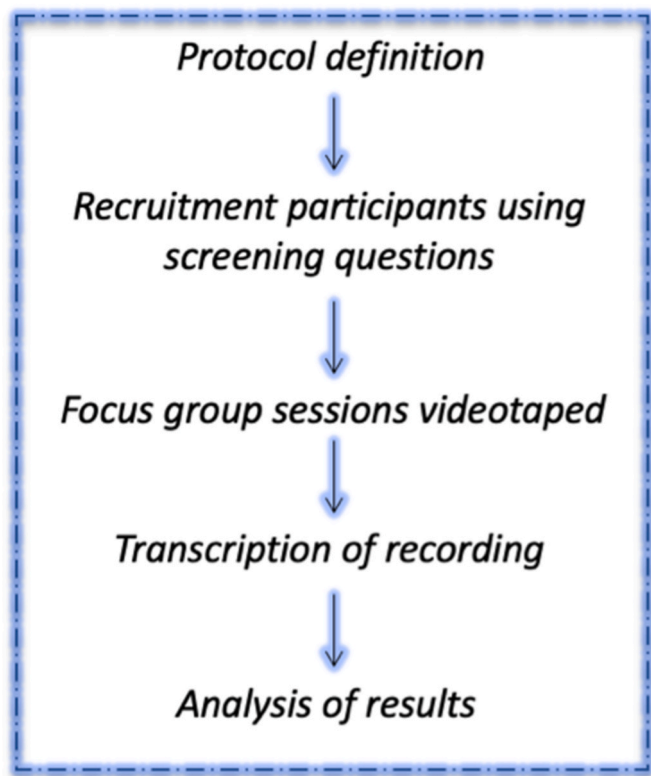


Fig. 2. Chart of the procedure followed to design and carry out the focus group. (Source: Our graphical elaboration of the chart)

Table 1

Characteristics of the participants in the different focus groups (between brackets, cities where sessions were carried out).

	Focus Group 1	Focus Group 2	Focus Group 3	Full sample	
	N = 8	N = 9	N = 9	N = 26	(%)
	(Milan)	(Rome)	(Bari)		
<b>Gender</b>					
Female	4	5	5	14	53.8
Male	4	4	4	12	46.2
<b>Age</b>					
18-30	1	2	1	4	15.4
31-50	4	5	6	15	57.7
> 50 y.o.	3	2	2	7	26.9
<b>Educational level</b>					
High school diploma	4	3	3	10	38.5
Bachelor's Degree	4	6	6	16	61.5
<b>Job</b>					
Unemployed	1	1	1	3	11.5
Freelancer	–	1	–	1	3.8
Part-time employee	3	4	3	10	38.5
Full-time employee	4	3	5	12	46.2
<b>Family members</b>					
1	3	–	5	8	30.8
2	2	3	–	5	19.2
> 2	3	6	4	13	50.0
<b>Role in fruit and vegetables consumption</b>					
Consumers	4	4	5	13	50.0
Non-rejecters	4	5	4	13	50.0

Source: Our elaborations of collect data

most represented age group was 31–50 y. o. (57.7%).

As regards the educational level, the convenience sample differs somewhat from the Italian population. Unfortunately, this discrepancy is a limitation of our research, probably determined by not having included a specific screening question, at the recruitment stage. In particular, participants' educational level was equally balanced for the focus group carried out in Milan. On the other hand, for the focus groups held in Rome and Bari, participants with a bachelor's degree (61.5%) prevailed over those with only a high school diploma (38.5%).

With regard to the jobs performed by the participants, the 3 groups were fairly balanced. In all groups there was a prevalence of employers (part-time or full-time) compared to the unemployed and freelancers.

The composition of the participants' households was heterogeneous. Exactly half of the participants have households consisting of more than 2 individuals, but there are also loners (30.8%) and nuclear families (19.2%), formed by only one more unit than the participant.

In addition, all participants reported a role in fruit and vegetable consumption. Due to the screening questions, the research involved only consumers and non-rejecters of fruits and vegetables. Their presence is balanced across the sample and across all groups.

## 4. Results

### 4.1. Customer journey

Fruits and vegetables category plays an important role in the mindset of respondents, regardless of geographic location and other characteristics, although it results in contrast with other affirmation in literature where other authors found out that the importance of the origin of fruits and vegetables [65].

In particular, fruit is consumed up to 5 times during the day. Almost the totality of the sample consumes it as a mid-morning or afternoon snack, especially at home but also outside the house, thanks to the possibility to slice it and take it with them. Furthermore, for a good part of the target, it also represents the closure of the main meal, both at lunch and at dinner.

For a minority, fruit is also the basis of their morning breakfast, together with milk and cereals.

Vegetables instead accompany the main meals, mainly as side dishes.

In fact, respondents report how they try to make their children consume as many vegetables and fruits as possible during the day proving, as Hartman et al. [9] stated, that adults believe that fruit and vegetable consumption constitutes a healthy source.

Specifically, for the target, fruit is the most natural and healthy alternative to any snack that children can consume as a snack at school as well as at home.

The importance of fresh fruit and vegetables in the diet of the interviewed sample and of their families determines for the target the need to buy food products with high frequency.

In fact, the target group buys fruit and vegetables from at least once a week up to 3 or 4 times a week in order to always have fresh products available.

### 4.2. Quality label

Thinking of products marked by quality brands and for this reason included in the register of quality products, the entire sample interviewed cites first of all the characteristics of these products, that is, the goodness, freshness and genuineness of the products themselves, and the certainty that they are excellent products of the national territory [16].

The emotions that the target associates with quality brand products are in fact positive, specifically safety, tranquillity and trust.

The images that the interviewees associate with quality brand products are relaxing and linked to nature, such as the earth and the sun. The cultivation recall of the land; the production in the most "natural" way possible, under natural sunlight rather than artificially in

greenhouses and less subject to industrial and chemical treatments. These factors respond to consumer concerns about environmental sustainability issues as Teuber [1], and requests Vermeir and Verbeke [5] affirmed.

In particular, targets from Central and Southern Italy spontaneously mentioned some quality brand products they know and habitually consume, such as wines, cheeses (in particular, Parmigiano Reggiano), Porchetta di Ariccia and fruit. In this regard, some interviewees already mentioned in this section Arancia Rossa di Sicilia PGI.

Thinking about known quality brands, the whole target mentions: PGI (Protected Geographical Indication), PDO (Protected Designation of Origin), CDO (Controlled Designation of Origin) and CGDO (Controlled and Guaranteed Denomination of Origin), mostly known by chance during purchases and, for a minority, through product advertisements seen on TV or in newspapers.

A small minority mentions the brand "Bio", considering it a quality brand like the brands just mentioned, while the vast majority has in mind that it is a different certification from that of quality products and that the two certifications are not superimposable.

For those interviewees who regularly purchase quality branded products, the presence of the quality scheme is obviously a primary criterion of choice regardless of the price of the product [41]. In fact, they tend to look for reassurance [43–46] and a guarantee of a positive product experience.

On the other hand, respondents who are not rejecters of quality branded products or sporadic users are decidedly more focused on the price of the product and are also guided by the appearance of the product, that is, in a subjective and personal way they evaluate whether the product of interest has an appearance that is pleasing to them.

All this also has an effect on the main place of purchase. In fact, for users the purchase takes place mainly in specialized stores (e.g. greengrocers) and the advice of the seller assumes for them an important role ("I ask for advice", "I also let myself be guided by the advice that the greengrocer can give me about a product").

For the second target, on the other hand, the supermarket is the place where they are most likely to buy food products.

### 4.3. Blood oranges

Following the approach "from general to specific", the principal investigator began the interview on oranges, in general, instead of focusing directly on "Arancia Rossa di Sicilia PGI". The topics covered were the consumption and purchase habits of the red oranges of the participants, with specific reference to the times and frequency of purchase and consumption, as well as the place of purchase to identify the criteria that guide the choice at the time of purchase and the relative motivations.

Seasonality proved to be an important driver of choice for participants who rarely consume oranges outside the winter period, when these fruits are produced in greenhouses and, for this reason, they are often considered less good. Even the origin of the product is part of the criteria of purchase choices, in fact Italian oranges prevail over those coming from abroad.

The appearance of the product is another criterion although other authors verified differently [65]. If the purchase of oranges takes place for consumption in wedges, the choice falls on the thick-skinned type, while those with juicy segments are chosen to be squeezed.

The frequency of consumption ranges from two or three times a week and in some cases up to once a day. The purchase usually occurs during the week in the main sale points and in particular at the greengrocer's or at the market stall and in supermarkets. In the latter case, consumers focus on quantity and savings rather than quality. Half of the sample, on the other hand, does not consider the price a limit, but prefers to buy quality oranges, often even certified, that ensure a product experience.

Purchase and consumption preferences favour red varieties (Tarocco, Sanguinello, Arance di Ribera and Arance Rosse) over blondes

(Washington, Navel, Valencia, etc.).

#### 4.4. Arancia Rossa di Sicilia PGI and brand value

At this stage, the principal investigator carried out the “spontaneous associations” test. In the mindset of the interviewees, the associations concerned “Sicily Region”, “Winter”, “Vitamin C and Health”, “Sweetness and Juiciness” and “Juicing”.

The indication of the place of origin was among the most relevant associations, in fact, compared to other fruit and vegetable products, oranges have a strong connotation of territoriality and geographical origin identified with the “Region of Sicily”.

The association “Winter” refers the consumer to the ripening season of oranges, i.e. the period that can guarantee a greater naturalness and goodness of the product and therefore the availability to purchase it.

With reference to “Vitamin C and Health”, the association hints at the multiple health and well-being benefits that consumer expect to derive from the consumption of fresh and seasonal oranges, in particular, for the action of the product on raising the immune system for adults and even more particularly for children.

Lastly, sweetness and juiciness are the main organoleptic features participants associate to oranges specially to squeezed ones. Fresh orange juice is, in fact, for about half of the sample, the prevailing way of consumption for the interviewees.

Finished the phase on oranges in general, and before starting the specific phase of the interview on the aspects of consumer behaviour regarding the habits of purchase and consumption of “Arancia Rossa di Sicilia PGI”, the principal investigator has ascertained the knowledge of this product and the corresponding “communicative code”. The last is the logo that identifies the “quality label PGI” together with the “logo” that ascertains the relative Consortium of protection guarantor of the geographical indication of the typical orange of reference.

As for the yellow and blue logo, the notoriety was high, while the white and red logo of the protection consortium was assimilated to the “Arancia Rossa di Sicilia PGI” only by about half of the sample interviewed.

In the opinion of those interviewed, the typical organoleptic characteristics - that the specific climatic and soil conditions of cultivation of the geographical area of reference allow to achieve - such as reddish color, consistency, degree of sweetness, shape, size, etc. constitute the specific production standards that contributed to obtaining the PGI mark. Guarantor of the brand orange PGI is the Consortium of protection that through strict controls ensures the origin from certain geographical areas of Sicily, as well as the guarantee of authenticity and goodness of the product that the organoleptic characteristics make possible with the right degree of maturation made in its seasonal period.

All this inspires trust in the consumers interviewed who, for this reason, attribute a high value to the product “Arancia Rossa di Sicilia PGI” and consider it a premium, reliable and excellent product which allows a positive consumption experience and of quality deriving from its unique and distinctive organoleptic characteristics.

As opposed to these positive elements, some interviewees declared some disadvantages in terms of higher prize and difficult availability compared to other varieties of oranges. The participants who habitually consume “Arancia Rossa di Sicilia PGI” do not consider price to be a limiting element to purchase. While the others, who are not users, or who are only sporadic users, are willing to spend to purchase this product, on average and at most, 20% more than the unmarked oranges they habitually buy.

The ways in which the sample gained the knowledge of the product are various: the majority at points of sale which, in the specific case of quality products and therefore “Arancia Rossa di Sicilia PGI”, are stores specialized in the sale of fruit and vegetables and supermarkets, with the exclusion of market stalls. Another channel of knowledge is the advertising of the product in internet or magazines.

#### 4.5. Profile of the consumer of Arancia Rossa di Sicilia PGI

Italian consumers of “Arancia Rossa di Sicilia PGI” appreciate the set of values of which certified quality products are bearers, so much so that they are willing to pay a premium price in relation to the guarantee that strict production controls endow the product with a high food safety, and find the quality aspects related to the organoleptic characteristics.

Consumers, in fact, prefer “Arancia Rossa di Sicilia PGI”, on one hand, as an expression of genuineness and food safety, on the other, because they know and appreciate the value of the typical characteristics of the product itself.

### 5. Discussions

In accordance with what Peschel et al. [45] investigated, all participants consume fruits and vegetables with high frequency by as they offer a healthy and nutritious contribution to their diet. Moreover, they satisfy consumers’ tastes, given the wide variety of products available on the market.

Thus, this study confirms what Mesias et al. [49] stated in reference to the attribute “naturalness”. In fact, it resulted that this category of products are an important part of the diet of the target of participants, who consume these products on more than one occasion during the day, preferring fresh products as they are perceived as more “natural”.

For the whole sample involved, it is fundamental that fruit and vegetables are present not only in their own diet, but also in the diet of the whole family and of their children, especially for the youngest ones, in order to guarantee them a correct intake of all the nutrients, as explored by Baseline et al. [10], necessary for optimal development in the different phases of growth and to keep the body healthy. This confirms that consumers have high health and nutritional benefits expectation when consuming fruit [10].

The target feels reassured when thinking about these marked products as Van Ittersum et al. [35] and Rabadán et al. [19] affirmed. In fact, it emerged the awareness of the interviewees who know that the origin from the Italian territory is certified and guaranteed and reduce to encounter risks as observed by Rabadán et al. [19]. These last aspects constitute a fundamental criterion that guides the target in the purchase of fruit and vegetable products for themselves and their families, and the reliability of these products is guaranteed by the passing of strict quality controls in all phases of production [14,15].

For the entire target group interviewed, quality branded products are recognized as the top products in a given category, the best in terms of taste because they are better controlled and obtained using standardized production procedures specific to a given geographical area according with Loureiro and McCluskey [14] and Kelly et al. [15] studies.

When the principal investigator carried out the “spontaneous associations” test for the main peculiarities of “Arancia Rossa di Sicilia PGI”, the results of the comparison showed “definitely positive and differentiated” characteristics for orange PGI with reference to tastiness, freshness, juiciness, deep red color, medium size, sweetness, thin peel and suitability for juicing as already found out by Ref. [66].

Moreover, corroborating Villari et al. [41] results, the participants who habitually consume “Arancia Rossa di Sicilia PGI” do not consider price to be a limiting element to purchase.

The set of values that consumers recognize for certified quality products confirm was Rabadán et al. [19] stated recently according to quality aspects. In fact, as demonstrated also by Vecchio and Annunziata [37] this target of consumers is attentive to health and to the certainty/constancy of the specific quality aspects of the product that can be found with the quality standard that the PGI trademark guarantees allowing to avoid the risk of incurring disappointment or dissatisfaction even with regard to the ideal taste and degree of ripeness of the orange.

## 6. Conclusions

The findings contribute to find out about the awareness, preferences and attitudes of Italian consumers about fruit and vegetables, and more specifically about Arancia Rossa di Sicilia PGI.

Fruit and vegetables play a relevant role in the eating habits of the interviewed sample.

The target buys with high frequency fresh fruit and vegetables for personal consumption and for the whole family. They go mainly to local markets because they can find the highest quality products, or, alternately, to the supermarket for practical reasons, where, however, the quality of fruit and vegetables is perceived as not always high.

The main drivers of purchase of fruit and vegetables for the target are: seasonality of the product; "Italianness" certified by the presence of the quality brand that guarantees its origin; price; appearance of the product; advice from the trusted greengrocer.

Participants perceived labelled products (such as Arancia Rossa di Sicilia PGI) as the top of the category and a reliable product of excellence whose quality is guaranteed because it is certified by third parties.

However, it emerged that only half of the interviewees recognizes the white and red logo of the Consortium of protection guarantor of the PGI of Arancia Rossa di Sicilia PGI.

According to one of the assumptions of this study, the demand for quality labelled products may increase, giving all the benefits they guarantee. However, when consumers do not know the labelled product, and so its guarantees, they may be not willing to pay a higher price than conventional products. This aspect results particularly relevant not only for the PGI Consortium because it suggests that some marketing strategies should be intervened in, especially with regard to the communication of brand identity to spread the knowledge about the quality labelled brand.

## 7. Limitation of the study

The authors took into account the possible biases typical of qualitative analysis by implementing possible strategies to reduce or eliminate them. Nevertheless, this study has some important limitations typical of the qualitative approach adopted, such as its lack of external validity due to the convenience sample adopted. In fact, there is a chance of participant selection bias due to the consumer convenience sample and possible differences between the resultant consumer groups and general sociodemographic characteristics of the Italian society it represents.

Moreover, there is no guarantee that the artificiality of the encounter will not introduce distortions in the type of interaction that takes place between the participants and, therefore, in the process of information construction, as compared to attitudes and behaviours that occur in a "natural" setting.

The number of participants involved in the focus groups was small but related to the high degree of product awareness. In fact, the

researchers conducted an exploratory phase to be followed by a quantitative survey with thousands of participants throughout the country. Conducting a survey on a national representative sample is certainly a recommendation for future research. Studies with a greater number of consumers with different demographic and behavioural characteristics are also necessary in order to establish segments with different preferences. Moreover, quantitative research among a nationally representative sample of older adults is needed to confirm the results of this qualitative analysis.

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## Author statement

I affirm that the content of this manuscript is original. All authors of this paper have read and approved the final version submitted. The contents of this manuscript have not been copyrighted or published previously. The contents of this manuscript are not now under consideration for publication elsewhere.

## Author contributions

All authors have approved the final article.

R. Selvaggi contributes to conceptualization, data curation, formal analysis, methodology, writing - original draft, writing - review & editing and visualization. C. Zarbà contributes to conceptualization, data curation, formal analysis, writing - original draft and writing - review & editing. G. Pappalardo contributes to writing - original draft, writing - review & editing, validation and investigation. B. Pecorino contributes to supervision and visualization. G. Chinnici contributes to investigation, conceptualization, writing - original draft, writing - review & editing, validation, supervision and funding acquisition.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

Data will be made available on request.

## Appendix A

Scheme of the focus group protocol.

n.	Sections	Aims	Time
1	Warm up	Giving housekeeping rules and explain the purpose of the study.	5 min
2	Customer journey	Analyzing frequency and purchase criteria for fruits and vegetables.	15 min
3	Quality label	Understanding whether participants are familiar with quality-labelled products, whether they purchase them, and what value they place on these label products.	45 min
4	Blood oranges Arancia Rossa di Sicilia PGI	Understanding participants' blood orange consumption and purchasing habits Understanding participants' familiarity with "Arancia Rossa di Sicilia PGI" and their consumption and purchasing habits for this product.	50 min

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n.	Sections	Aims	Time
	<i>PGI brand value</i>	Understanding the value attributed or not to the PGI brand by consumers.	
	<i>Profile of the consumer of Arancia Rossa di Sicilia PGI</i>	Determining the profile of the typical consumer of "Arancia Rossa di Sicilia PGI" and understanding what stimulates and what stops its consumption and purchase.	
5	<i>Conclusions</i>	Thanking participants and closing the session by giving them last opportunity to add something.	5 min

Source: Our elaboration of the scheme

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