

Article

Consumer Behaviour Regarding Certified Food

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Abstract: The consumer decision-making process for buying food products is based on various factors. One of these is the perceived value that the consumer acquires upon seeing a certification label, such as “Protected Designation of Origin” (PDO) and “Protected Geographical Indication” (PGI), which is an indicator of product quality and the degree of sustainability of the supply chain. The aim of the study is to identify the main factors influencing the behaviour and purchasing intentions of Italian consumers through the divulgation of a survey and the application of a statistical approach. The results were elaborated upon using a conceptual model, estimated following the partial least squares approach to structural equation modelling. As a result, the perception of quality influences purchasing decisions and food patterns, as labels play an increasing role in contemporary society, thus making quality standards relevant for the buying outcome. This research contributes to supporting studies on the importance of certifications of origin, as well as highlighting that food safety is a major determinant in the purchasing of certified food products.

Keywords: food quality; consumer perception; purchasing intentions; food certification; social sustainability



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1. Introduction

On an international level, a transformation of consumer preference is taking place towards increasingly “smart”, more efficient, ready-to-eat, healthier food options and nutraceutical products. The new objectives of food production are no longer just involving food security, but also satisfying consumers’ nutritional needs and preferences, as well as adopting more sustainable production processes. Thanks to this occurrence, consumers identify certification as an attribute of quality products [1,2]. Through specific production-regulatory frameworks established by business cooperatives, the growth of certified brands, such as the PDO and PGI labels, is promoted. Additionally, the first position in Europe regarding certified agricultural products and alcoholic beverages is occupied by Italy [3]. Each Italian region has peculiar qualitative, sensorial, and organoleptic characteristics, which determine the incrementation of the “Made in Italy” food excellence sector. In 2022, there was a significant increase (+6.4%) in terms of production value. The number of PDO and PGI Italian-branded products was 853, with a total production value of 20% of the Italian agri-food sector, totalling EUR 20.2 billion. Global exports in the same sector increased by 8.3% with respect to 2022, exceeding EUR 4.7 billion.

The wine sector is the most productive category, comprising 527 different types of wine, with a total production value of EUR 11.3 billion and involving around 110 thousand supply chain actors. Northern Italy (Veneto, Piedmont, and Tuscany) is the area with the highest production level. Among the certified food products, the most profitable categories are the cheese sector, meat-based products, fruit, vegetables, and cereal sector, and finally the olive oil sector, with a production value of EUR 85 million [4]. The increased globalisation of markets has also affected the agri-food sector, considerably accentuating the level of competition based on prices. The purchasing power of consumers as well as

their knowledge of consumption has increased due to economic development, increased competition, and an explosion of market information [5–7].

Today, the application of a product differentiation strategy is necessary to achieve a competitive advantage and to make the business more economically sustainable, but it must be associated with the offer of a superior benefit for the consumer to enhance their willingness to pay (WTP) a premium price. Many small agri-food companies are using PDO and PGI certifications as tools of differentiation to enhance the geographical traditional significance, to diversify their product offering, and to contribute to building and strengthening the company's reputation. However, obtaining a PDO or PGI brand is only a starting point, and can lead to an excessive increase in costs and bureaucratic processes, which may not correspond to a favourable response from the market. Beyond the boundaries of the local geographical area, traditional products are exposed to strong competitive pressure based on prices, which derives from the high substitutability between producers, production areas, and countries of origin. However, being produced locally means that the supply chain of these typical products offers job opportunities even for the populations of rural areas in which specific traditional foods are usually produced. Thus, PDO and PGI products are more socially sustainable as opposed to conventional alternatives, as they favour rural development and protect the biocultural heritage of local territories [8]. The consumer's own understanding of and connection with the product and its geographical origin greatly influence the market for PDO and PGI food products.

The concept of quality possesses a strong abstract and subjective nature which is linked to the perception of the consumer. Several aspects contribute to defining the degree of food quality, such as taste and other organoleptic properties, as well as origin and labelling [8–11]. The consumer-perceived quality value is a predictor of customer satisfaction and also of positive purchasing intention (PI) [12]. Food labels and certificates can act as quality cues, but only if they are available, are understood by the consumer, and are considered trustworthy [13,14]. In fact, purchasing habits are also influenced by wellness, traceability, attention towards fair trade, social sustainability, environmental impact, and brand image [15–17]. This article focuses on exploring the main factors that influence the consumer's decision-making process regarding purchasing by applying a methodology based on research hypotheses, identified through a survey and the statistical models used to validate them. The research question is "What factors influence the purchasing intentions of consumers in terms of certified products?".

2. Materials and Methods

2.1. Research Hypotheses

In line with recent studies [18–20], five factors were extrapolated among the factors that influence consumers' intention to buy, which are listed and described in Table 1.

Table 1. Hypotheses associated with specific factors.

Factors	Research Hypotheses
Purchasing intention	H1: The presence of certification on food products influences the PI of consumers.
Perceived quality of certified food	H2: Consumers associate certified food products with being of higher quality than those without certification.
Food safety	H3: Consumers consider certified food products safer than those without certification.
Price Sensitivity (WTP)	H4: Consumers are willing to pay a premium price for PDO/PGI products.
Knowledge and awareness	H5: Consumers are well informed regarding PDO/PGI certifications.

H1: Purchasers have access to a lot of information from brands and labels, which can influence their buying preferences, but only if they take it into consideration when shopping. Decision making regarding food purchasing has become a highly complex and elaborate process because customers have access to multiple market options when selecting from the imported and local stock available [20]. Moreover, consumer buying behaviour and choices depend upon their preferences, attitudes, lifestyle, motivations, and perceptions, as each consumer belongs to a different culture, nationality, region, and ethnicity [21,22]. The individual attitude of the consumer is particularly influential to their purchasing decisions [23–25]. Many studies have shown that the availability of products of improved quality and better value does not necessarily imply that customers will certainly purchase said goods. The buying intentions of consumers are also influenced by market competition and political factors; thus, purchasing behaviour also varies across countries for this reason. Consequently, in many cases, purchasers are encouraged to avoid foreign products and endorse the buying of homegrown commodities through ethnocentric and nationalistic movements. This is intended to favour the development of local businesses and to boost the local economy and employment rate [26].

H2: Product quality is a key factor for consumer decision making. It refers to the attributes and characteristics of a product that are in dynamic interrelation and give it reliability and high performance to make its functions satisfy consumer needs. Researchers have suggested that quality perception is based on cognitive evaluations of product attributes [27,28]. The consumer's evaluation of the degree of quality attributed to a certified food product occurs in two stages. The first stage takes place before buying the product, while the second arises during the consumption of the food [29]. Labelling signals the level of quality of a product and favours the information flow between the producer and the consumer. However, in many cases, consumer-perceived quality generates barriers to the recognition of objective quality attributes of food products, either attributing high quality status to products that are unworthy or not giving genuinely high-quality products sufficient recognition. Consequently, different perceptions of food quality emerge at different times and in different places.

H3: Safety and hygiene are characteristics that consumers are increasingly looking for in food products. Geographical origin, raw materials used, production process, and traceability are aspects that guarantee food safety and quality. In fact, consumers tend to associate a certain degree of quality with a specific level of security. The awareness of food products' impacts on human health leads consumers to be more demanding in their choices.

H4: Price is very often a key component of the PI, as many consumers believe that a high price is associated with a high product quality and vice versa. The WTP is the premium price that consumers are prepared to pay for a product or service when different attributes (ethical characteristics, nutritional components, benefits) are recognized [30–32]. Therefore, the WTP is a measure of PI and can be considered as a variable that influences consumer behaviour and varies due to differences between the individuals who make up a target population or market [33–36].

One of the questions that we asked ourselves was whether consumers are willing to pay a premium price for a certified product while having available a similar alternative without certification [3].

H5: In recent years, the understanding and knowledge of the concepts of quality marks and product certification has increased among consumers. At the same time, certification is also recognized as a key success factor for product development in the market. The presence of information asymmetries can be ascribed to the lack of proper policies and enforcement, the non-conformity of producers with current legislative requirements, the inability of consumers to understand available information, and unclear marketing strategies [37]. Consumer PI can be positively influenced by providing them with more detailed product information (e.g., health benefits, environmental sustainability, etc.) to decrease the knowledge gap between producers and consumers, thus increasing consumer

trust in a specific brand [29]. Recent studies have revealed that, when the PGI and PDO labels are described to consumers, this greatly impacts their PI, demonstrating the crucial importance of knowledge regarding label systems and quality certification schemes [38].

2.2. Data Collection

An online survey was carried out on the attitudes towards the factors described in Table 1 and was distributed via Facebook and Whatsapp randomly. The questionnaire included a section on the description of the characteristics of the sample (i.e., gender, age, educational level, geographic region) and another on the role that the factors play in determining consumer choices. Table 2 shows the correspondence between the chosen factors and the questions used to measure them. In most of the questions, the possible answers referred to an ordered scale.

Table 2. Factors and corresponding questions of the survey.

Factors	Questions (Variables)
Purchasing Intention	1. How much importance do you give to certification for a food product?
	2. In front of a PGI product with a part of the ingredients of foreign origin, how would you react?
Perceived quality of certified food	1. Do certifications assume an important requirement in choosing a product?
	2. Can Italian products certified with PGI or PDO contain EU or non-EU ingredients?
Food safety	1. Do you consider a product that bears PDO or PGI certifications as being safer?
	2. How much safer do you consider a certified product than one without certification?
Price sensitivity	1. Would you be willing to pay more for a certified food product?
	2. If you have two similar products, which one would you choose: the one with certification but more expensive or the other without certification but cheaper?
	3. How much more would you be willing to spend on a certified product?
	4. How do you consider the current prices of quality certified products?
Knowledge and awareness	1. Do you know the meaning of PDO certification?
	2. Do you know the meaning of PGI certification?
	3. Do PDO/PGI have the same meaning for you?

Data were collected over a period of almost two years, precisely from May 2021 to May 2023, via cloud storage, which allowed for an online evaluation of the answers in real time. The study was restricted to residents of Italian regions only; thus, the data were screened to eliminate any irrelevant responses.

2.3. Statistical Analysis

The particular structure of the questionnaire and then of the data suggested using a latent variable model to estimate the relationships between the considered factors. Within this family of models, structural equation modelling (SEM) plays a central role and is one of the most commonly used, thanks to its properties and interpretability, among other things. SEM is a multivariate statistical methodology used to investigate the causal relationships among a set of constructs (or latent variables, LV) which cannot be observed directly and are, therefore, measured through a set of indicators (or manifest variables, MV) related to them. More formally, given a data matrix X , partitioned by columns into J blocks $X_1, \dots, X_j, \dots, X_J$, a causal model can be defined considering each block X_j ($j = 1, \dots, J$) as the subset

of MVs which are an expression of the latent variable j . To estimate the model, we followed the partial least squares approach to SEM [39–43], which, together with LISREL [44], is one of the most used estimation methods for latent variable models. Unlike LISREL, the PLS-SEM pursues a predictive aim that is preferable for our research scope. In addition, although all the relationships specified in the model are supposed to be linear, a non-metric PLS function is available to estimate non-linear relationships [45], typically arising when dealing with ordinal data, like in this study.

The PLS-SEM algorithm is based on alternating, until convergence, an external and internal estimate of the LVs based on sets of linear regressions [40,41]. The algorithm provides an estimation of both the path coefficients (or inner weights), measuring the relationship between the LVs, and the outer weights, measuring the relationship between a LV and the related MVs. It also provides estimates of the latent variables' scores, i.e., individual values of the (unobserved) LV. This feature is particularly useful when, like in this study, the researcher is interested in estimating the value of a response LV at the individual level. Based on the main findings from the analysis of the literature, as well as on the structure of the survey and the data obtained, a model was specified considering the factors listed in Tables 1 and 2. The LVs (constructs) in the structural model are each described by the answers provided by the survey respondents to the corresponding set of questions listed in Table 2, playing the role of MVs.

3. Results and Discussion

3.1. Answers of Survey

The study involved 306 respondents aged 18 years and above from urban areas in Italy: 43.5% were male and 56.5% were female. The age group of 50–59 (11.1%), followed by the group of under 20 years old (9.2%), had the lowest numbers of representatives. Most of the consumers (62.7%) had completed higher education (bachelor and postgraduate studies), and some were students attending a university course (10.8%). These numbers and percentages are similar to those reported by Sampalean et al. [46], whose study focused on Italian consumers' awareness, perception, and knowledge of European quality certifications.

Furthermore, many authors include the distribution of questionnaires as part of their research methodology, in certain cases concentrating only on specific demographic groups [30,47,48]. For example, Gultekin and Veuphuteh [49] created an online questionnaire for Canadian and Turkish university students to investigate the relationships between price sensitivity, perceived quality, and buying intention of fast-food products.

Regarding the knowledge of PDO and PGI marks, 90% and 81%, respectively, of the total participants in this study confirmed that they knew the meaning and the difference between these certifications.

The percentage of respondents that believed that certified products are safer was 87.6%. A question was subsequently proposed to better understand the PI, and whether certification is an important requirement for choosing a specific product. For 35% of the participants, certification was important, but they could also do without it, while for 54.6% of the remainder, certification was significant at the time of purchase. This can be explained by the broad meaning of the term, which, in the minds of consumers, is associated with local food, traditions, typical products, and food safety.

The value of the specific origin and reputation of local products is widely documented in the literature [2]. In fact, traceability and food safety are two of the most discussed topics among the analysed articles. Concerning the issue of ingredients coming from other countries, 26.8% of respondents preferred only Italian ingredients; 25% were indifferent to the origin of ingredients; 30% stated that it depends on which foreign country the ingredients come from; and the remaining 19% replied that they would buy the product only if there were no other substitutes of Italian provenance available. The origin of the product seems to be quite an important factor for food purchasing decisions. Furthermore, 86.7% of consumers were willing to pay more for a certified product, and 79.3% of the population would choose products with certification, even though they are more expensive.

The relationship between perceived quality and WTP at a premium price was also highlighted. The possible answers to the question regarding the consideration of the current prices of quality certified products were as follows: too high, high but a safer product, correct, or low. Based on the percentages obtained, 51% of the participants believed that safety justified the high price, while for about 10%, the price was too high, and 37% of participants believed it was the correct price.

Regarding perceived quality, the focus was on two main questions to be presented to the consumers: the first based on the meaning of the concept of quality and the second on the requirements that a product must have in order to be considered of quality. The definition of the concept of quality for the survey participants was linked to greater safety of the product (62.0%), attention to the origin of the ingredients (18.2%), and consumer satisfaction towards specific needs (15.8%), and for the remainder, it was a premium price. In the last case, we asked the respondents to choose two answers among the five proposals, with respect to nutritional value, belonging to a brand, possession of certification, food safety, and origin and production chain.

From the responses of consumers, it emerged that they were very attentive to safety and health requirements, which ranked first in the rating scale (40.1%). More than likely, membership and possession of a certified trademark are synonymous to food safety (29.6%), as they can guarantee protection and quality control. Next comes the importance of having an adequate nutritional value (16.2%), origin (13.3%) and famous brand membership. In fact, possible contamination worried consumers, and for this reason, their attention was directed towards healthy and safe products.

3.2. The SEM Estimations

The interest of this study focuses more on the sets of coefficients measuring the relationships between variables and on the individual scores of the LVs than on model assessment measures, i.e., we are interested in these results given the model. However, an overall good fit was detected, supporting the adequacy of the model to explain the relationships' structure generating data.

Figure 1 shows the typical graphical representation of an SEM based on ellipses (here depicted as hexagons) representing the LVs, rectangles representing the MVs, and arrows representing the relationships between them. In our model, Food Safety and Knowledge and Awareness are exogenous constructs, while perceived quality of certified food (PQCF), price sensitivity (WTP), and PI are endogenous constructs. We consider the PI as a response variable, and we aim at exploring to what extent it is affected by the other LVs. In the measurement model, the relationships between the MVs and their corresponding LVs are supposed to be formative, i.e., supposing that each MV affects the latent factor it is related to. Such a model was estimated using the R packages *semnr* and *plspm*.

Particular focus was placed on two aspects: the first regarding the dependence of PI on selected factors, and secondly, the dependence of PI on the socio-demographic characteristics of the population.

In Figure 1, the influence of the LVs food safety, knowledge and awareness, perceived quality of certified food, and price sensitivity (WTP) on the PI can be noted. This influence was measured by the so-called inner weights (or path coefficients), i.e., the estimated coefficients β_j measuring the relationships between two latent variables in the structural model (also called inner model), also shown in Table 3.

As shown from the table above, the PI depends significantly (in decreasing order) on the perceived certified food quality, food safety, and knowledge and awareness variables. This result is in line with the hypothesis that safety, in terms of hygienic–sanitary quality, is the most strongly competing element in the perception of a quality food product, in accordance with the study of Purwanto and Sudargini [50], in which food safety was the most important predictor of consumer attitude. It is one of the factors that has attracted the greatest attention among Italian consumers, who are increasingly concerned about the origins of raw materials and the nutritional characteristics of food products.

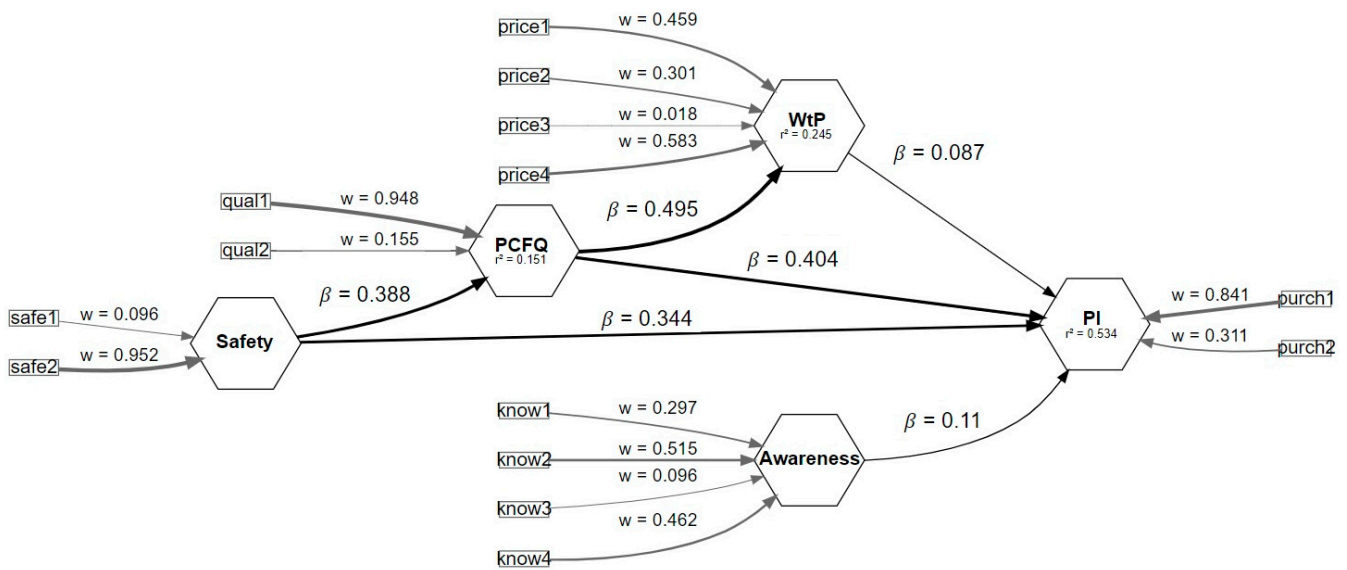


Figure 1. The estimated SEM.

Table 3. Path coefficient estimates.

Response variable: Perceived certified food quality				
	Estimate	Std. Error	t value	Pr(> t)
Food safety	0.39	0.05	8.00	0.00
Response variable: Willingness to pay				
	Estimate	Std. Error	t value	Pr(> t)
Perceived certified food quality	0.49	0.05	1.02	0.00
Response variable: Purchasing intention				
	Estimate	Std. Error	t value	Pr(> t)
Food safety	0.34	0.04	7.63	0.00
Knowledge and awareness	0.11	0.04	2.54	0.00
Perceived certified food quality	0.40	0.05	8.26	0.00
Willingness to pay	0.09	0.04	1.88	0.00

Hence, it can be deduced that, for these consumers, safety is recognized as a key factor in choosing food products and certifications representing guarantees of protection. Although consumers are aware of the meanings of both PDO and PGI certifications, from the weight attributed to the variable of knowledge, it seems that it does not have a significant influence on the propensity to purchase these products. On the other hand, consumer awareness and comprehension of certifications is crucial, because when consumers do not have knowledge of the certified product, they may not be willing to pay a higher price for it [38].

As far as price sensitivity is concerned, consumers would generally be willing to spend more for certified food products, thus acknowledging their intrinsic value and recognizing the certification itself as an important, but not fundamental, requirement in choosing a good.

The WTP, according to Fernández-Ferrín et al. [34,51], is influenced by other elements, such as the type of product. In fact, between two similar food products, consumers tend to opt for the one with certification, even if it is more expensive, once again justifying a greater attention towards food safety. Compared to other research, it can be noted that the price and WTP are not the most influential elements in determining consumer PI. For example, the high price of organic food has been identified as the most relevant barrier to organic food purchasing and consumption in previous studies [18].

The data show that the attributes that most determine the PI of consumers are food safety and perceived quality, which are both guaranteed by the presence of the PDO/PGI-certified labels. Therefore, our initial hypothesis is confirmed, as the presence of certification on food products positively influences the PI of consumers who are willing to accept a justified premium price with respect to a higher perceived quality.

The individual PI scores, estimated by the previous step of the analysis, were further investigated through an analysis of variance (ANOVA) to test for differences among specific groups of respondents, depending on gender, age class, education level, and region of residence. In particular, the Welch one-way test was used for testing the effects of age, gender, and education, in combination with the Games–Howell post hoc test or pairwise t-tests to test for differences in all possible pairs of groups as an alternative to the standard one-way ANOVA, because the homoscedasticity hypothesis, required by the standard analysis, does not hold for these variables.

The results, shown in Table 4, revealed a significant effect (indicated by an asterisk) of Age and Education level on PI score.

Table 4. ANOVA test for the effect of age and education level on PI.

Groups	N	Test Statistic	DFn	DFd	p-Value	Method
Age	306	15.36	5	104.3	<0.001 *	Welch
Gender	306	1.27	1	266.3	0.261	Welch
Level of Education	306	4.99	3	71.0	0.003 *	Welch
Region	304	1.316	16	289	0.186	Standard

As shown in Figure 2, the PI tends to increase with age (a) and, although to a lesser extent, with education level (b).

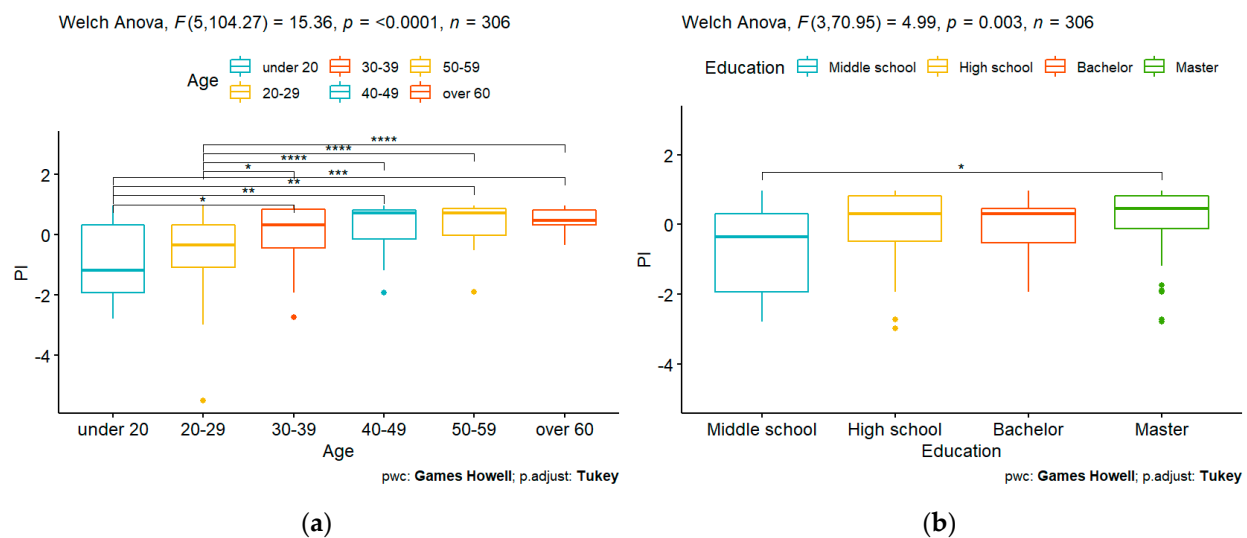


Figure 2. PI across (a) ages and (b) education levels. */**/**/* represent significance levels.

The various aspects that emerged from this study were confronted with national and international literature. From the results obtained, one in every two participants (48.7%) believes that the consumer is a key stakeholder of the supply chain and obtains more information about the product from the certification. In second place, and of equal value, came the production area that obtains more attention and the producer that acquires more credibility and competitiveness in their own brand. These findings are in line with national research, which is mostly concentrated on quality and the market of niche food products. Most of Italian research is centred around sustainable consumption; the purchasing behaviour of Italian consumers; and consumer knowledge of specific certified food products,

such as Sicilian blood oranges, local wine, Parmigiano Reggiano cheese, tomatoes, honey, and novel food products [2,38,52–56].

At an international level, European and Asian research focuses mainly on consumer perceptions regarding safety and hygiene. China has increased its concern regarding issues of social welfare and health conditions in recent decades due to various environmental and ecological problems [12]. Some authors studied the change in consumer behaviour during the COVID-19 pandemic in terms of price sensitivity and perceived quality [6,49,57]. During emergencies, the attention of consumers towards food quality and their concerns regarding food security increase, posing a critical demand shock on the food market as consumers become more willing to pay a premium for quality food products. Consequently, the number of certified products purchased increased post-pandemic [49].

Furthermore, in their study, it was observed that Cui et al. [58] refer to the influence of food safety information on the PIs of Chinese consumers, while Wang et al. [20] and Wang and Tsai [59] evaluate the traceability system of fresh food products, the perceived health and safety benefits, and the repurchasing intentions of these products.

Other countries, such as Indonesia, Vietnam, India, and Turkey, are also becoming more interested in food quality and nutrition, signifying that attention to human health is increasing [60]. Hoque et al. [61] state that the beliefs of consumers in Bangladesh affect their PIs positively, while health consciousness, on the other hand, does not. Additionally, Wang and Tsai [59] found that Japanese consumers are significantly more concerned about food safety than American and Romanian consumers, for whom price is a more important factor. In fact, consumers belonging to different countries have different views regarding food health and safety issues. Southern European cultures (e.g., Spain, Italy, and Greece) tend to be more concerned with the quality of certified food, while Northern European cultures (e.g., the UK, Scandinavia, and Germany) place more emphasis on food security [3,59]. Therefore, people may have different requirements regarding food safety depending on their cultural background, and this determines their need for more detailed information on traceability.

4. Conclusions

Quality assurance manifests itself through means of certification, which in turn confer trust in producers and justify attributing a premium price to certified food products. The presence of certification, regulated by precise control standards, gives the consumer a guarantee of food safety, authenticity, respect for tradition, and a sustainable supply chain.

The contribution of this work consists of providing support to the studies relating to the importance of certifications of origin, as well as defining the key variables which guide the intentions to purchase certified products. The data collected show that consumers are increasingly concerned about food safety, they perceive the objective quality of PDO and PGI food products, and they pay attention to information on traceability and geographical origin. Indeed, from our analysis, it emerges that consumers are willing to pay a premium price for PDO and PGI products, as they are aware of the production costs and bureaucratic procedures that are involved in certification systems, which guarantee a socially and sustainably responsible production chain. The methodological approach chosen allowed for the obtainment of useful information; however, the study could be improved by conducting further research with a larger and more representative sample to extend and generalise the results. The main limitation is that information regarding household management was not asked of the participants. Thus, a further investigation could be conducted regarding the shopping responsibilities of the household and who is responsible for payment for food products. Additionally, new variables could be considered to evaluate the impact of psychophysical factors that also guide consumer PI.

These results have practical implications for the production, marketing, and promotion of nationally and internationally certified food products. There is a strong need for a policy that guarantees PDO and PGI products, and that invests in agriculture and livestock in order to ensure food safety and sustainability, to assist producers and to support local economies.

The results of this study can be of aid for managers of national and foreign food companies in the decision-making process and implementation of better policies in the European food market to ensure the availability, accessibility, and quality of agri-food products.

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