

# When less isn't more and more isn't less: is there an overlap between “protected designation of origin”, “mountain product” and “organic” in Italy?

Consumers' WTP for EU multiple quality labels

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## Abstract

**Purpose** – Using a generic cheese as an anchor product, in this study consumers' preferences for different EU quality schemes have been investigated. Specifically, the study aims to understand whether “Protected Designation of Origin” (PDO), “Organic” and “Mountain Product” labels are independent or if there are some synergies existing between them, questioning – at the same time – whether this alleged exchange of value plays a positive or negative role in terms of consumers' willingness to pay.

**Design/methodology/approach** – A discrete choice experiment (DCE) was conducted on 600 Italian consumers performing a random parameter logit model. The respondents were representative of the Italian population in terms of age, gender and geographical distribution. Consumers' preferences for the presence of “Organic” and “Mountain product” labels were assessed in the DCE, together with the effect of price, for both PDO and generic cheeses.

**Findings** – Consumers are willing to pay a premium in price for “Organic” and “Mountain Product” *per se*, for cheese with and without the PDO denomination. Considering the interaction effects, results showed that the combined use of “Organic” and “Mountain Product” labels do not decrease consumers' intention to buy. However, when applied on a PDO product, these attributes generate a lower consumers' willingness to pay in comparison with the generic ones, highlighting a possible overlapping between them.

**Originality/value** – Despite the abundant literature on EU quality schemes in many food categories, this study represents one of the first attempts to measure the interaction effect between different EU quality schemes.

**Keywords** Organic, Consumer choice, DCE, PDO, EU quality Schemes, Mountain product

**Paper type** Research paper

## 1. Introduction

Quality is widely recognized as the *sine qua non* of purchasing choices. However, the multifaceted nature of food quality makes it difficult to understand and measure this concept. From a consumers' perspective, quality is mostly attributable to taste and convenience, as well as to credence attributes such origin, healthiness and production methods (Grunert, 2005). However, these qualities are not verifiable blindly (Steenkamp, 1990). Thus, to overcome this uncertainty, consumers need to find some strategies to infer food quality before buying. Traditionally, in direct sales, producers had to fill the information gap, providing consumers with all the information they need. However, industrialization carried a drastic twisting in consumption habits, pushing towards a solution able to guarantee easy and fast



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choices. Due to the increasing feeling of time scarcity (Lloyd *et al.*, 2014) and effective time constraints when shopping (Grunert *et al.*, 2010), consumers are nowadays demanding ready-to-eat products (Stiletto *et al.*, 2020). To better follow the path of time saving, they prefer shopping in malls rather than in retailers shops (Lloyd *et al.*, 2014). With these new purchasing patterns, producers are no longer able to directly communicate with consumers during purchase.

Commercially speaking, this structural change represents a hurdle for producers, who have always taken advantage of consumers' bent in seeking information at the time of purchase to communicate their values, thus improving the attractiveness of their goods. This is particularly true for those producers who offer goods of high quality, which reasonably lose their value without adequate communication (Akerlof, 1970). The European Commission, within the EU quality policies, has adopted different strategies to protect high quality products through the implementation of quality labels that can be awarded to products produced in defined areas or with specific methods (Regulation (EU) No 1151/2012; Reg. (EU) No 848/18). These schemes aim to add value to traditional products, allowing producers to communicate their higher quality attributes to consumers and get higher market prices as a reward for the greater efforts and expenses linked to the production of high-quality goods. This applies especially to rural areas, where agriculture is strictly ground to traditional production methods and the farming sector has greater economic relevance (Gragnani, 2013). However, being multifunctional instruments, EU quality schemes are not only actively involved in the economic and commercial development of rural areas, but, at the same time, foster local values such as environmental stewardship, culture and tradition (Gragnani, 2013).

Given this framework, it is easy to understand why the EU quality policies are recognized as a hot topic, which has gained remarkable interest among producers, consumers and researchers. From the producer's side, the awareness of quality schemes is currently increased all over Europe. However, it should be stressed that not all of these schemes are adopted to an equal extent (Grunert and Aachmann, 2016) and that the distribution of the number of registrations is skewed towards Southern Europe countries (Ceï *et al.*, 2021). Similarly, differences are observed also in consumers' knowledge of these schemes across the EU (European Commission, 2020).

With respect to consumers, given the relevance of the topic, the literature has stressed the need to investigate their preferences for EU quality schemes more in depth (Albuquerque *et al.*, 2018). Besides, Truong *et al.* (2022) highlighted some other gaps in the literature, linked to the relationship between consumers' trust in certifications (at different levels) and their consumption behaviour. Although consumers generally attach a positive role to EU quality labels (de-Magistris and López-Galán, 2016; Glogoveţan *et al.*, 2022), opinions on the effect of multiple quality schemes on the same product are still controversial. For this reason, this paper aims to firstly understand what consumers' preferences are for different EU quality schemes through a Discrete Choice Experiment conducted among 600 consumers in Italy. Estimating the consumers' willingness to pay (WTP) for "Mountain Product" and "Organic" labels on cheeses which bear the PDO certification or not, we are able to understand what the interplay is of different EU quality schemes on Italian consumers' preferences. Then, considering the interaction effect between all these quality attributes, we aim at determining whether the values associated by consumers to each attribute are overlapping or perceived as separate. The paper is organised as follows: in the next section a brief policy contextualization and an overview of consumers' perception about EU quality schemes are provided. Then, the third section discusses the design and implementation of the DCE. Sections 4 and 5 report the results and discussion. Conclusions are drawn in the last section.

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## 2. Background

### 2.1 *The policy framework*

EU quality schemes are rooted in the EU's Common Agricultural Policy (CAP). With the reform of agricultural policy of 1992, the focus of the CAP turned upside down, shifting from "quantity" (first pillar) to "quality" (second pillar) (Becker, 2009). To better communicate quality, Organic products (Reg. (EU) No 848/18), Geographical Indications and Mountain Products (Reg. (EU) no 1151/2012; Delegated Act (EU) No 665/14) fall under the EU quality policy. Products protected by these EU quality schemes have double benefits, because they are both legally protected and receive financial aids from the EU. Besides, they support the development of rural areas and their communities, helping producers to better market their products, both in Europe and abroad. At the same time, they help consumers to recognize high quality products and enjoy their unique characteristics.

Specifically, a food product can boast a Geographical Indication (GI) if it has a specific link between the place where it is made and its quality. Among GIs, products bearing the Protected Designation of Origin (PDO) certification have the strongest link to the place in which they are made, since every part of the process must take place in a specific area. Since the quality of a PDO product is essentially or exclusively due to its geographical origin and production method, PDO products must follow a particular product specification to bear the indication.

Conversely, the "Mountain Products" scheme aims to protect the products made in difficult natural areas, such as mountains. Specifically, this scheme guarantees that a specific good is made in a mountain area, with raw materials and animal feed coming from this area as well. According to Bentivoglio *et al.* (2019), using the "Mountain product" label as a tracing method assures the authenticity of the origin of these products, consumer's loyalty towards these goods could increase, thus boosting the sustainable development of such marginal rural areas.

When it comes to products of animal origin, the term "Mountain product" can be applied to goods made from animals that are reared for at least two-thirds of their life and processed in mountain areas. By way of derogation from Article 31(1) (b) of Regulation 1151/2012, processing operations (for milk and milk products), the slaughtering and pressing of olive oil may take place outside mountain areas within 30 km [1].

Regarding the Organic certification, the initial regulation (Regulation EEC No. 2092/91) has been amended on several occasions, passing from providing indications for agricultural products and foodstuffs in 1991 through the extension of 1999, which also concerns livestock production. The original aim of the CAP of increasing agricultural productivity having been achieved, the objectives of the policy have therefore moved towards rural development and promotion of quality products, together with the integration of environmental conservation in agriculture (Becker, 2009). A product can bear the organic certification if its production respects the rules of organic farming, namely prohibition of the use of GMOs, hormones and ionising radiation, as well as a limitation on the use of artificial fertilisers, herbicides, pesticides and antibiotics.

### 2.2 *Consumers' perception of EU quality schemes*

The renewed consumers' interest in traditional foods (Almli *et al.*, 2011) has strengthened the role of EU quality labels of decision-aid to consumers, filling the information asymmetry related to the production process and reducing the uncertainty associated with desirable product characteristics, such as taste. However, EU quality schemes play an effective role in guiding purchasing choices only if consumers are aware of them (Grunert and Aachmann, 2016). The literature stressed the weak consumers' awareness of quality labels, especially in Northern (London Economics, 2008) and Eastern countries (Kos Skubic *et al.*, 2018). Indeed,

different studies proved that consumers generally have a low level of objective understanding of EU quality schemes, all over Europe (Aarset *et al.*, 2004; Fotopoulos *et al.*, 2011). However, Cilla *et al.* (2016) found that consumers are generally able to infer food quality from EU labels even if they don't fully understand them. Indeed, they consider EU schemes as a cue of quality in broader terms, associating the labels with concepts such as support of local producers or superior quality goods for GIs and mountain products (van Ittersum *et al.*, 2007; Zuliani *et al.*, 2018), or the naturalness and healthiness of food in the case of organic and mountain products (Verhoog *et al.*, 2003; Zuliani *et al.*, 2018).

Despite such studies identifying the major drivers of purchase, a key limitation is that the effect of the different EU quality schemes on consumers' preferences have been investigated separately, under the assumption that these products are alternative goods which meet different consumer needs (Roselli *et al.*, 2018). Moreover, even in the case where authors have jointly investigated consumers' preferences for a product bearing more than one EU quality label (see for instance Aprile *et al.*, 2012), it is not well known to what extent there is an overlap between these labels. Shedding some light on this issue could have important implications for the marketing sector. Indeed, empirical evidence on consumers' attitudes towards a simultaneous labelling provides useful insights, as it clarifies to what extent an additional EU quality scheme increases the overall value of the food, as found by Roselli *et al.* (2018) for extra-virgin olive oil (EVO). In that study, the authors found a profitable use of both organic and GI labels on EVO for producers, considering the potential to increase the market penetration among those consumers who are actually willing to pay a premium price to have both. On the contrary, Ankamah-Yeboah *et al.* (2019) studied the interaction effect between organic and environmental schemes on consumers preferences, questioning the informative effectiveness of multiple labels. Results from their study pointed out that an environmental label adds no extra value to the organic scheme since this environmental cue is perceived as already paid with the organic label. This study aims to expand the body of knowledge in this field, assessing the impact of different EU quality schemes on consumer preferences, as well as estimating the overlapping of different labels.

### 3. Data and method

Data were collected during April and May of 2021 through an online survey, administered by an external agency, of 600 Italian consumers aged over 18. The sample was representative of the Italian population in terms of gender, age and geographical distribution (Table 1). The questionnaire investigated consumers' knowledge and consumption habits of "Organic" products, "Geographical Indication" and "Mountain product(s)". Yet, the fulcrum of the survey was to gather consumers' stated preferences for EU quality. As widely reported in the literature, Discrete Choice Experiments (DCE) represent a useful instrument to achieve this objective (see for instance Ryan *et al.* (2001)). Among the methodologies used to elicit preferences (e.g. Contingent Valuation and Preference-Based and Choice-Based approaches) Choice-Based approaches are currently widely used, being the most realistic. Indeed, in DCEs consumers are asked to select one (or more) product(s) within a series of competing goods, as they would normally do in a purchasing situation (Merino-Castello, 2011).

Against this background, a DCE was performed in the present study, through implementation of a Random Parameter Logit Model (RPL). Being a random utility maximization (RUM) model, it is assumed that the decision-maker adopts a utility-maximizing behaviour (Marschak, 1950). Under this hypothesis, consumers maximize their utility when purchasing, and utility is modelled as a function of preference weights and attribute levels of the product (Traets *et al.*, 2019).

The attributes and levels used in DCE are reported in Table 2. Specifically, "Organic label" is considered as a dummy variable, taking value 1 if the product bears the organic

Variable	Levels	Piave PDO Sample (N = 300)		Generic Cheese Sample (N = 300)		Italian population %
		N. obs	%	N. obs	%	
Age (years)	18–24	24	8.0	24	8.0	8.00
	25–34	38	12.7	38	12.7	12.7
	35–44	46	15.3	46	15.3	15.3
	45–54	58	19.3	58	19.3	19.3
	55–64	50	16.7	50	16.7	16.7
Gender	over 65	84	28.0	84	28.0	28.0
	female	154	51.3	154	51.0	51.3
Education level	male	147	49.0	147	49.0	48.7
	compulsory school	20	6.67	32	10.7	56.0 <sup>†</sup>
	upper secondary school	190	63.3	167	55.7	26.3*
	university degree	69	23.0	77	25.7	17.4*
Family income (€/month)	post-university degree	21	7	24	8.0	0.3*
	less than 2,500	106	35.3	118	39.3	<i>Mean</i> 1627.33* €/month
	about 2,500	173	57.7	145	48.3	
more than 2,500	21	7.0	37	12.3		
Number of household members		<i>Mean ± St. Dev.</i>		<i>Mean ± St. Dev.</i>		<i>Weighted mean</i> 2.35
		2.90	1.23	2.76	1.43	

**Note(s):** <sup>†</sup> In Italy, compulsory schooling is currently not defined by a school cycle, but by reaching the age of 16. Data on compulsory education in Italy is not available on the Eurostat database. Values are estimated \* Eurostat (2020)

**Source(s):** ISTAT (Italian National Statistics Institute) and Eurostat

**Table 1.** Descriptive statistics of the sample

Attributes	Piave PDO Levels	Generic Cheese Levels	Code
Organic label	Presence	Presence (level D)	(1)
	Absence	Absence	(0)
Mountain product label	Presence	Presence	(1)
	Absence	Absence	(0)
Price	4.34 €/300 g	4.34 €/300 g	
	5.29 €/300 g	5.29 €/300 g	
	6.25 €/300 g	6.25 €/300 g	

**Source(s):** Our elaboration

**Table 2.** Description of the CE attributes and levels

certification and 0 otherwise. The same goes for the “Mountain product” label. The price attribute is considered as a continuous variable and its levels reflect the real retail prices for the selected cases. In this study, a between sample design was applied, using two different cheeses. Specifically, 300 consumers assessed Piave PDO, an Italian PDO cheese produced in a mountain area, and 300 consumers assessed a generic cheese that does not bear any PDO name. The selected generic cheese differs from Piave PDO cheese only for the lack of Geographical Indication name and certification. This allows consumers’ WTP to be estimated for “Mountain Product” label and “Organic” certification on products which bear the PDO certification or not, thus deducing the role of Geographical Indication in purchasing choices.

The choice experiment design was built on a statistically optimal design. As stressed in the literature, this methodology currently plays a predominant role in the design of discrete choice experiments since it allows the information gained from each choice set (Johnson *et al.*, 2013) to be maximized. Indeed, when setting a DCE, researchers have to limit the number of choice sets presented to respondents (Traets *et al.*, 2019), due to their limited ability to concentrate when too much information is provided (Zwerina *et al.*, 1996). Among the different methodologies currently adopted (e.g. orthogonal design, utility balance and statistical efficiency, as reported in Rose *et al.*, 2008), we implemented the statistically efficient design. This method, selecting the choice sets that force respondents to make a trade-off, allows the confidence ellipsoids around the parameter estimates to be minimized (Traets *et al.*, 2019).

Indeed, this choice design is based on the identification of alleged values of the parameters included in the model. To gather prior information for constructing the efficient design, a pilot study on 40 consumers was conducted in March 2021. For the pilot study, an efficient design assuming zero parameters was built using the *R* Idefix package, proposed by Traets *et al.* (2019). Results of the pilot study, estimated through a Conditional Logit Model (McFadden, 1973) using STATA 17, suggested that consumers generally attached a statistically significant positive value for both Organic and Mountain Product attributes. These results are coherent with evidence in the literature. As regards the price variable, we found—as expected—a negative value attached: the lower the price, the greater the utility that consumers derive from the purchase of the good.

Once a prior distribution of the preference parameters  $\pi(\beta)$  for the consumers in the pilot study had been defined, a statistically efficient design was drawn. Through calculation of the DB-error of the design (1), the generalized variance of the parameter estimates was minimized, thus maximizing the determinant of the information matrix ( $\Omega$ ) (Kessels *et al.*, 2006). Given  $p$  as the number of parameters the model contains, the DB-error of the design (1) is expressed as follows:

$$DB - error = \int \det(\Omega)^{1/p} \pi(\beta) d\beta \quad (1)$$

Based on the efficiency design of the DCE, 18 choice sets for each type of product (generic and PDO) were obtained and divided into two blocks within each treatment sample. Therefore, each respondent had to make 9 choices. For each choice task, respondents were asked to indicate their preferences among two multi-attributes alternatives and a no choice option, to make the choice task more realistic (Hensher *et al.*, 2005).

A random parameter logit model was then implemented to assess the consumer preferences expressed in the DCE. This model allows the restriction to be overcome of assuming homogeneity in consumers' preferences typical of the McFadden Multinomial Logit (MNL) (traditionally applied in DCE). Indeed, a specific utility function was considered for each individual, and it can be defined as:

$$U_{njt} = \beta_n x_{njt} + \varepsilon_{njt} \quad (2)$$

where  $\beta_n$  is a vector of coefficients specific to the individual  $n$  and  $x_{njt}$  is a vector of observed attributes that are related both to respondent  $n$  and alternative  $j$  on choice set  $t$ . The error term  $\varepsilon_{njt}$  is iid distributed and is independent of  $\beta_n$  and  $x_{njt}$ . Considering the  $\beta_n$  and  $x_{njt}$  vectors expressed in (2), the probability that consumer  $n$  chooses alternative  $i$ , conditional on knowing  $\beta$ , is given by:

$$P_{mit}(\beta_n) = \frac{\exp(\beta_n x_{mit})}{\sum_{j=1}^J \exp(\beta_n x_{njt})} \quad (3)$$

however,  $\beta_n$  is unobserved and it is not possible to condition  $\beta$ . Considering that  $\beta$  has a distribution  $f(\beta|\theta)$ , where  $\theta$  are the true parameters of the distribution (Train, 2009), the unconditional probability of the observed sequence of choices is the conditional probability (3) integrated over the distribution of  $\beta$  on  $\beta_n$  (i.e. the random parameter logit probability) and can be expressed as:

$$P_{ni} = \int \frac{\exp(\beta' x_{ni})}{\sum_j \exp(\beta' x_{nj})} f(\beta|\theta) d\beta \quad (4)$$

## 4. Results

### 4.1 Descriptive statistics

Figure 1 reports descriptive statistics of the respondents' consumption habits for products bearing the EU quality labels. We found that "Organic" and "PDO" goods are the most appreciated by Italian consumers. Indeed, 79.4% of interviewees have consumed "Organic" products at least once per month in the past year, 76.9% "PDO" products and only 27.9% "Mountain product(s)". Among the others, the food category with the highest consumption share for all three EU quality schemes is that of milk and dairy products. However, for this class, consumers seem to pay more attention to the PDO attribute. When it comes to fruits and vegetables and eggs, it emerged that Italians prefer "Organic" products to the others, whereas for olive oil, pasta and bakery goods, and meat consumers positively value both PDO and Organic products.

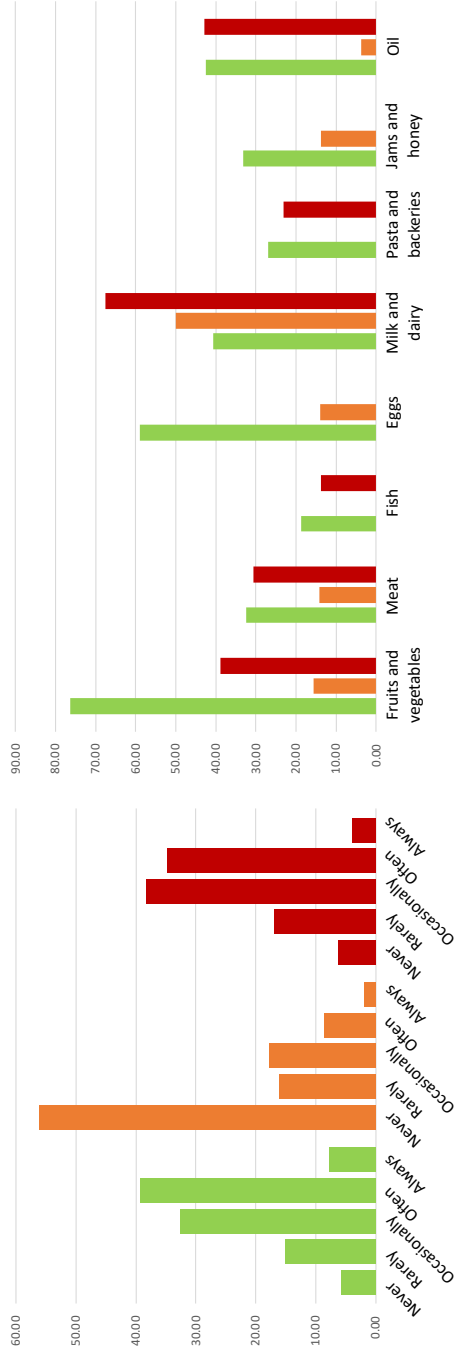
Italian consumers are, on average, aware of the meaning of the different EU quality schemes, as reported in Table 3. Indeed, 49.2% of the consumers in our sample define the Organic production as a method that avoids the use of GMO (Genetically Modified Organisms), 66.2% believe that artificial fertilisers, herbicides and pesticides are not used and 40.5% deem that it is more environmentally friendly. 68.2% of the sample define the "Mountain Product" as made exclusively in a mountain area and 41.2% feel that it is made with raw materials and feeds derived from mountain areas. When it comes to the PDO attribute, 73.5% of consumers properly recognized that PDO goods are produced exclusively in a specific area, 37.5% deem that the quality of these products is strictly due to the geographical origin, while 40.0% that they have to follow a certain product specification.

### 4.2 Choice experiment

The model estimates, reported in Table 4, show significant coefficients for all the main effects. The random parameters are assumed to be normally distributed. Price and interaction variables are considered as fixed (Ubilava and Foster, 2009).

As expected, results stressed the positive role of EU quality schemes in explaining consumers' preferences. For both models, we found that the "Mountain Product" label and "Organic" certification are positively evaluated by the consumers in our sample. Specifically, we found that consumers are willing to pay more for these quality attributes in the case of a generic cheese rather than in that of a PDO cheese. Without the Designation of Origin, consumers only rely on the "Mountain Product" and "Organic" attributes when choosing what to buy, thus attaching a higher value to these attributes. On the contrary, in the case of Piave PDO cheese, consumers are evaluating a product bearing the PDO sign. It follows that, when purchasing, also the Designation of Origin has an effect in explaining consumers' choices. As found by Roselli *et al.* (2018), organic and PDO certifications are not independent. It means that an overlap exists between PDO and organic certifications, which affects consumers' choices. This partially emerged also in our study, as we found that the consumers in our sample are willing to pay a premium price for the quality attributes. However, the WTP

**Figure 1.** General frequency (%) of purchase of “Organic”, “Mountain product(s)” and “PDO” products (a) and disaggregated frequency by food category (b)



**Note(s):** Green bars refer to “Organic” products; orange bars to “Mountain Product(s)” and red bars to “PDO” products. In (a), “Rarely” means “3–4 times per year”; “Occasionally” means “at least once per month”; “Often” means “at least once per week” and “Always” means “several times per week”.



	N	%	Consumers' WTP for EU multiple quality labels	
<i>A product which bears the "Mountain Product" label:</i>				
Is produced exclusively in mountain areas	409	68.17	<b>53</b>	
Is more genuine than conventional products	106	17.67		
Is produced with raw materials and feed coming from mountain areas	247	41.17		
Is devoid of GMO(s)	108	18.00		
Guarantees a higher level of food safety than conventional products	88	14.67		
Is more environmentally and animal friendly than conventional products	145	24.17		
<i>A product which bears the "Organic" certification:</i>				
Is devoid of GMO(s)	295	49.17		
The use of artificial fertilisers, herbicide and pesticides are forbidden	397	66.17		
Is more genuine than conventional products	152	25.33		
Guarantees a higher level of food safety than conventional products	166	27.67		
Is more environmentally and animal friendly than conventional products	243	40.50		
<i>A product which bears the "PDO" certification:</i>				
Is exclusively produced in the area designated by the denomination	441	73.50		
Is more genuine than conventional products	72	12.00		
Is devoid of GMO(s)	120	20.00		
It follows a certain product specification	246	41.00		
Is more environmentally and animal friendly than conventional products	80	13.33		
The quality of the product is due to the area of origin	225	37.50		
Supports local producers	167	27.83		
It has stricter controls	155	25.83		
It has a strong link with the territory	182	30.33		

**Source(s):** Our elaboration

**Table 3.**  
Descriptive statistics of consumers' understanding of the EU quality schemes

	Piave PDO		Generic cheese without PDO	
<i>Random parameter</i>				
Mountain product label	1.30 (0.09)	***	1.52 (0.11)	***
Organic certification	1.30 (0.08)	***	1.50 (0.09)	***
<i>Fixed Parameter</i>				
Price	-0.08 (0.01)	***	-0.03 (0.01)	**
Mountain*Organic	-0.19 (0.24)	n.s.	-0.13 (0.24)	n.s.
<i>SD</i>				
Mountain product label	1.45 (0.49)	***	1.88 (0.43)	***
Organic certification	0.18 (0.58)	n.s.	-0.19 (0.52)	n.s.
Number of respondents	300		300	
Number of Obs	8,100		8,100	
Log-likelihood	-2643.66		-2483.07	
McFadden pseudo R <sup>2</sup>	0.112		0.163	

**Note(s):** \* Significance at 10% level; \*\* Significance at 5% level; \*\*\* Significance at 1% level; n.s. Not significant. Standard errors in parentheses.

**Table 4.**  
Model estimates

(calculated as the ratio between the opposite of the attribute coefficient and the price) is on average 3.3 times more for the organic attribute in the case of a generic cheese than for the same attribute in the case of the PDO cheese. The same goes for the Mountain product label, as we found that the Mountain Product attribute loses importance in the case of a PDO product with respect to the generic cheese.

The mWTP estimates calculated diverge (i.e. exceed) from the average values found in the literature for both products. In this respect, it should be noticed that these WTP estimates do not reflect the monetary amount actually paid by consumers in a real purchasing scenario, as they represent an estimate of the consumer surplus linked to a specific type of cheese with specific features (Poelmans and Rousseau, 2016). Furthermore, consumers in both cases have attached almost zero value to the price ( $\beta_{\text{price}} = -0.08$  for Piave PDO;  $\beta_{\text{price}} = -0.03$  for a generic cheese) and therefore the value of the WTP estimates increased. This implies that, for both products, consumers do not use low price as a discriminating factor in their purchasing choices.

Moreover, we found that the interaction between “Organic” and “Mountain Product” is not significant for both generic and PDO cheeses. It follows that the presence of both labels does not alter the effect of the “Organic” or “Mountain Product” labels *per se*, which are positively evaluated by consumers in both cases. This could be partially explained by the fact that the consumers in our sample correctly distinguished the two labels. Since consumers are not confused about the meaning of the label, “Mountain Product” identity is clearly defined, thus reducing the possibility of overlapping with the Organic certifications among all the consumers.

In addition, to determine the interaction effects of EU quality schemes, from the magnitude of the standard deviation (Table 4) we can easily derive some additional information about consumers’ preferences for the quality labels *per se*. As the standard deviation of the organic parameter ( $\sigma_{\text{organic}}$ ) is not significantly different from zero, we can appreciate that the consumers in our sample positively evaluate the “Organic” attribute unanimously, in both cases (PDO and generic cheeses). On the contrary, it emerged that, in both cases, some consumers associated a negative WTP to the “Mountain Product” attribute, although the evaluation for this label is on average positive. Indeed, the standard deviation for the “Mountain Product” attribute is significantly different from zero for both the PDO cheese ( $\sigma_{\text{mountain\_product}} = 1.45$ ) and the generic one ( $\sigma_{\text{mountain\_product}} = 1.88$ ). Given  $\Phi$  the cumulative standard normal distribution, the percentage of consumers who are not willing to pay more for the “Mountain Product” quality scheme is given by  $100 \cdot \Phi\left(-\frac{b_k}{s_k}\right)$ , where  $b_k$  and  $s_k$  are the mean and standard deviation of the  $k$ th coefficient respectively (Hole, 2007). It means that 21 and 19% of consumers are actually willing to pay less for a having a cheese labelled as “Mountain Product” in the case of a generic cheese and in the case of the Piave PDO cheese.

## 5. Discussions

Results from the model estimates underline the positive role played by EU quality schemes in orienting consumers’ preferences. Indeed, consumers always show a positive willingness to pay for a cheese that has the “Mountain Product” label or “Organic” certification, independently of the presence of a PDO name. Our results find support in the literature, given that consumers are generally willing to pay more for a product which bears the “Mountain Product” label (Mazzocchi *et al.*, 2021; Mazzocchi and Sali, 2021). According to Mazzocchi *et al.* (2021), consumers perceive as valuable a good produced in mountain areas considering that the mountain origin is *per se* a symbol of naturalness, healthiness and environmental sustainability, although the “Mountain product” label does not have a process specification that really guarantees these aspects. This is confirmed by Bassi *et al.* (2021), who found that

consumers appreciate mountain products as they are able to embed characteristics and meanings that recall the place of production. Despite the consumers in our sample clearly recognizing the meaning of the labels, the “Mountain product” attribute could still have a halo effect (Medina-Molina and Pérez-González, 2020) in explaining consumers’ preferences by recalling idyllic images in their minds. The same goes for the organic attribute, which is widely recognized as a positive cue of the product (Cicia *et al.*, 2002). The literature stressed that consumers generally perceived organic goods as not only healthier and fresher than conventional ones, but also more environmentally-sustainable, as organic production has a role in mitigating GHG emissions and reducing the negative environmental impact of agriculture and food production (Canavari and Coderoni, 2020; De-Magistris and Gracia, 2016; Van Loo *et al.*, 2014). Since all these attributes have a positive meaning, the overall value of the organic product increases. Unsurprisingly, we found that nearly half of the consumers in our sample deem that an organic good is more environmentally and animal friendly than a conventional one. This partially explained why the WTP for this attribute is positive, independently of the coexistence of the PDO certification.

Contrary to what is found in the literature for other quality attributes, results from the DCE do not show an overlap between “Organic” and “Mountain” product attributes. Indeed, the interaction between these attributes is not significant, meaning that the presence of both EU quality schemes does not alter consumers’ perceptions of the labels *per se*. As stated before, this could be partly explained by the fact that Italian consumers have a clear idea of what the different quality schemes mean (Nomisma, 2018). This allows the labels to fulfil their role of reducing information asymmetry in an efficient way. Therefore, consumers are actually able to make informed choices.

However, we found that when more than two labels are present on the package, namely not only “Organic” and “Mountain Product(s)”, but also “PDO”, consumers are willing to pay less for the quality attributes. Indeed, we found that WTP estimates of consumers in the “Piave PDO” group are significantly lower than those of the respondents in the “generic cheese” group. Since there are no statistically significant differences between respondents in the two groups in terms of socio-demographic characteristics, we hypothesise that those differences in the appreciation of the product are due to the presence of the “PDO” certification. Indeed, the products presented in the DCE in the two groups differ, *ceteris paribus*, only by the PDO denomination. The reasons behind these results could be sought in the possible overlap between “PDO” and “organic” attributes or between “PDO” and “Mountain Product” attributes. As found by Roselli *et al.* (2018), a correlation does exist between consumer behaviour when purchasing GIs products and when purchasing organic products. According to the authors, consumers who gain a positive WTP for both “organic” and “PDO” attributes are attracted by the same cues of the products. They search for experience attributes, such as taste and are sensitive to health and environmental concerns. Despite Italian consumers associating PDO products with more sustainable environmental practices only in 13.33% of the cases, the link between the Designation of Origin and the territory is recognized by most of the interviewees in our study. Therefore, consumers may not be willing to pay much more for a product that, although with different labels (“Organic”, “Mountain product” and “PDO”), certifies the “same” attention to the environment and the territory. Adding information about the sustainability of the environment through the PDO label could not add extra value to the organic label, since environmental protection is perceived to be already paid with the organic one, as found by Ankamah-Yeboah *et al.* (2019).

Another possible explanation for this decrease in WTP is linked to the fact that the presence of multiple labels could lead to a reduction of the total utility rather than the sum of each label taken individually (Barreiro-Hurle *et al.*, 2010; Drugova *et al.*, 2020; Heng *et al.*, 2016). Specifically, Heng *et al.* (2016) found that when the number of labels increases, consumers’ approval for label combination increases too, but with decreasing rate. This is due

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to the low ability of consumers to process a huge amount of information and to the rising costs of search for information.

Against this framework, it should be recalled that the WTP estimates are closely related to the value attached to the price. In both cases, we found that consumers attached an almost null value to the price attribute. Namely, we found that consumers did not choose one product over another because its price was lower. This could be due to the consumers' perceptions about the price levels presented in the choice sets, considered to be too low for the proposed product. However, the price levels in the experiment represent the actual price values for the selected cheeses. The mWTP for a specific characteristic being the ratio between the opposite of the coefficient of that characteristic over the coefficient of the price (Poelmans and Rousseau, 2016), the lower the price, the higher the value of the mWTP for that attribute.

## 6. Conclusions

Nowadays, producing and consuming high-quality agri-food products have become a priority across Europe. However, producers are increasingly struggling to communicate the quality of their products to consumers, due to the lifestyle changes imposed by the hectic modern society, which coerces consumers to make faster and faster purchasing choices and leads marginal areas into a slow decline. EU policies and, in particular, the Common Agricultural Policy (CAP), are actively involved in the enhancement of quality production and rural areas, which can lead European agriculture to a stronger position in the market. To this end, EU quality schemes are currently promoted and adopted at EU level as a proponent of agri-food quality, with a domino effect on the development of rural areas. However, to achieve the objectives that have been set, it is necessary to fully understand what consumers' perceptions of these EU quality schemes are.

Despite the relevance of this topic, while many studies have examined consumer WTP for "organic", "PDO" and "Mountain product" labels, studies that examine the interaction between these quality labels are scarce. In this article we have estimated consumers' preferences for "Organic" and "Mountain product" labels, investigating the impact of combining these labels on overall WTP for cheeses which bear the PDO indication or not. We found that consumers are willing to pay a premium in price for "Organic" and "Mountain Product", for cheese with and without the PDO denomination. When it comes to the interaction effects, we found that there is no overlapping between "Organic" and "Mountain Product", in the case of both generic and PDO cheeses. However, we found that consumers are willing to pay less for organic and mountain products quality schemes if the product also bears the PDO denomination. Our results have important marketing implications for the agri-food industry about the use of multiple labels on food products. Results stressed that providing more information is not always the best strategy for companies, as consumers may derive a lower utility from the combination of different types of information. "Organic" and "Mountain product" labels could be presented jointly on the package as they represent two clear and distinct concepts for consumers. However, in the case of PDO products, this combination may not be the most efficient and, as a result, producers may benefit more from using fewer quality claims.

Indeed, having different certifications on the same products involves higher production costs, which are balanced only if consumers are willing to pay more. The results of our study, providing producers with information about consumers' attitude (expressed in monetary terms) towards cheeses with multiple quality labels, allow them to understand if it makes sense to invest in these certification systems. Specifically, we found that a PDO product may no longer be attractive to consumers if it also boasts "Organic" and "Mountain product" certifications. Hence, GI manufacturers may not benefit from certifying their products with other quality schemes, as the certification costs may not be borne by the product price.

Further research needs to be conducted on this point, with the aim of investigating to what extent the interaction between different EU quality schemes affects consumers' willingness to pay.

#### Note

1. In Italy, this distance is reduced to 10 km for milk and milk products, according to Decree N. 57,167 of 26 July 2017.

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