

RESEARCH

Open Access



Consumers preferences and social sustainability: a discrete choice experiment on 'Quality Agricultural Work' ethical label in the Italian fruit sector

Eleonora Sofia Rossi¹, Luca Cacchiarelli^{2*} , Simone Severini³ and Alessandro Sorrentino²

*Correspondence:
cacchiarelli@unitus.it

¹ Department for Innovation in Biological, Agro-Food and Forest Systems, University of Tuscia, Via San Camillo de Lellis snc, 01100 Viterbo, Italy

² Department of Economics, Engineering, Society and Business, University of Tuscia, Via del Paradiso 47, 01100 Viterbo, Italy

³ Department of Agriculture and Forest Sciences, University of Tuscia, Via San Camillo de Lellis snc, 01100 Viterbo, Italy

Abstract

The Italian legislator has adopted several instruments to discourage undeclared work and exploitative labour in agriculture, mostly of a penal-repressive nature. Among the direct and indirect policy measures, the 'Quality Agricultural Work Network' represents an interesting approach to producing a 'whitelist' of farmers compliant with labour regulations. A law proposal intends to establish the 'Quality Agricultural Work' (QAW) ethical label to incentivise farmers to join the network, to which a limited percentage of farms have signed up. This study aims to investigate consumer preferences for the QAW label in the Italian fruit sector. We conducted a choice experiment on a sample of 324 consumers. Willingness to pay for ethical labels was estimated before and after information treatment was administered to evaluate the prospective effects of promotional and information campaigns. The information treatment conveyed a clear and concise message about the QAW project and its ethical label. The results show that consumers would pay a high price premium for fruit produced under fair working conditions, indicating that there may be a market space for the QAW label. Moreover, consumers perceive environmental and social sustainability claims as complementary contexts where both dimensions of sustainability are relevant.

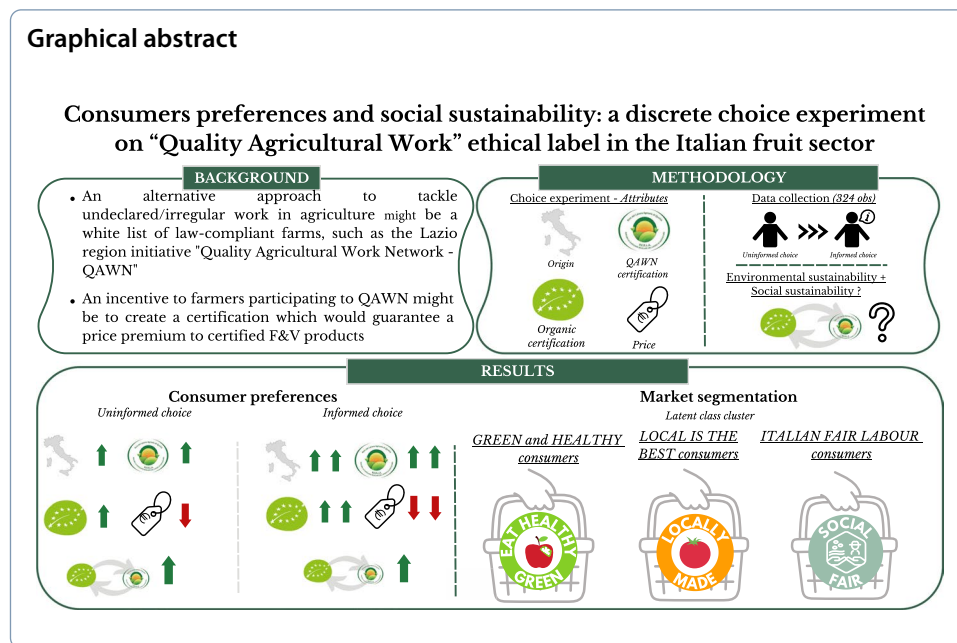
Key points

- A law proposal intends to establish a 'Quality Agricultural Work' (QAW) ethical label to incentivise farmers to join the 'Quality Agricultural Work Network'.
- We conducted a choice experiment to investigate consumer preferences for the QAW label in the Italian fruit sector.
- The results show that consumers would pay a high price premium for fruit produced under fair working conditions.

Keywords: Agricultural labour, Fair working conditions, Quality Agricultural Work Network, Ethical consumption, Social sustainability

JEL Classification: D12, J43, Q18





Introduction

The agricultural sector is more vulnerable to the use of undeclared labour than other economic activities. In the EU, around 25% of the agricultural labour force are irregular workers, with remarkably high levels in Portugal (60%), Bulgaria (50%), and Italy (30%) (Williams and Horodnic 2019). Vulnerability factors include both the structural characteristics of the agricultural system (e.g. in the fruits and vegetable sector), characterised by seasonal activities, production peaks at certain times of the year, and unbalanced bargaining power along the agro-food chain which often leads farmers to receive an ‘unfairly low’ share of food value (Augère-Granier 2021; Cangemi and Pettinelli 2021; Sorrentino et al. 2018; Russo et al. 2023). Therefore, farmers use informal workers, such as unpaid family members and unskilled labour, and employ irregular labour relations to decrease production costs and to overcome the problem of recruiting workers in seasonality peaks (Barberis et al. 2018; Antonioli et al. 2023). Illegal intermediation (e.g. the ‘caporalato’ system) is sometimes used to employ temporary workers in the agricultural sector (Osservatorio Placido Rizzotto and Flai GCIL 2018). It takes advantage of the vulnerability of exploited workers, who are often subjected to degrading labour in terms of working time, pay, social contributions (paid by employers for their employees’ insurance), and health and safety at work (Costantini 2018; Leccese and Schiuma 2018).

Either direct or indirect policy measures can be used to tackle undeclared work in agriculture. Tools such as higher penalties, increasing the perceived or actual risk of detection, written contracts on the first day of work, and certified cash registers are employed to deter irregular work (Williams and Horodnic 2019). A relevant indirect approach, recently introduced in CAP 2023–2028, is represented by the social conditionality of CAP payments based on compliance with tax, social security, and labour laws. The Italian legislature has adopted several instruments to discourage the use of irregular labour, mostly of a penal-repressive nature, such as criminalising illegal intermediation and labour exploitation (Leccese and Schiuma 2018). However,

simplifying compliance might be a key strategy of governments, making it easier and more beneficial for employers, the self-employed, and workers to operate on a declared basis (Williams and Horodnic 2019). In Italy, two policy initiatives are part of this approach: joint recruitment in the agricultural sector and the 'Quality Agricultural Work Network' (QAWN) project. The former, through the mutual sharing of workers, aims to stimulate aggregation processes and ensure greater stability of the employment relationship (Cangemi and Pettinelli 2021). The latter tackles undeclared work and exploitative labour in agriculture through 'whitelists' of farms based on their degree of compliance with the rules (fiscal law, labour law, and social security provisions). The current configuration of the Quality Agricultural Work Network presents some issues related to the voluntary nature of membership and the lack of real incentives to participate, which has led to scarce adhesion (Cangemi and Pettinelli 2021). Italian policymakers (Ministero del Lavoro e delle Politiche Sociali 2020) have recently planned to i) revise the admissions requirements, ii) establish a system of membership incentives, and iii) review the territorial organisation of the network. A plausible incentive for farmers participating in the network might be to create an ethical label that would guarantee a price premium to products certified with fair labour claims, deriving from the reputational advantage of participation in the ethical circuit (Rossi et al. 2022). The first regulatory attempt to establish a 'Quality Agricultural Work' (QAW) ethical label certifying respect for workers' rights was interrupted by the early end of the XVIII legislature (Senato della Repubblica 2021). The Italian Senate initiated a new legislative process in May 2023 (Senato della Repubblica 2023). The law proposal states that i) participation in the Quality Agricultural Work Network is a prerequisite for joining the scheme; ii) farms which adhere to the scheme will benefit from fiscal incentives, advantages in public calls for tenders and promotion and information campaigns about the new label (Senato della Repubblica 2023).

Agrifood markets have rapidly changed, with both vertical and horizontal differentiations playing a role in defining the market (Cacchiarelli et al. 2018). Differentiation claims include credence attributes related to environmental and other social outcomes, which are associated with consumers' willingness to pay (Caswell and Padberg 1992; Moser et al. 2011). Although certifications in the agrifood sector have mainly focused on environmental sustainability and product origin (Borrello et al. 2022; Delmas and Gergaud 2021), there have been few recent studies in EU contexts that have analysed consumer preferences for certifications indicating respect for workers' rights. For example, Drichoutis et al. (2017) and Piracci et al. (2022) found that consumers would pay a substantial premium, respectively, for strawberries in Greece and wine in Italy produced under fair working conditions. In the past, social labels in the EU context were mainly related to fair trade for products imported from developing countries, such as bananas, coffee, and chocolate (Akaichi et al. 2016; Blackman and Naranjo 2012; De Pelsmacker et al. 2005; Loureiro and Lotade 2005; Poelmans and Rousseau 2016). Environmental certifications (e.g. organic production) and certifications of origin (e.g. Protected Designation of Origin) are associated with higher price premiums compared to social labels (Poelmans and Rousseau 2016). Consumers associate specific attributes with organic products, such as healthiness, food safety, and environmental protection (Rizzo et al. 2020; Seo et al. 2016; Schleenbecker and Hamm 2013).

Since various labels (environmental, social, and origin) have a simultaneous presence in the market, it is worthwhile to investigate how interactions between certifications affect consumers' willingness to pay (WTP). It would provide relevant implications for producer decision-making and policymaking analysis concerning certifications. Previous studies have shown conflicting results, demonstrating complement and accumulation effects in some cases (e.g. Onozaka and McFadden 2011), while in other cases (e.g. Zhu et al. 2023), substitution effects among certifications were identified.

With this work, we intend to provide new evidence of consumers' preferences concerning socially sustainable F&V consumption in Italy and the relevant policy implications. Specifically, we perform a discrete choice experiment to estimate the WTP for a hypothetical QAW ethical label in the Italian watermelon market. The respondents were provided with some essential information on the QAW label to enable us to compare consumers' preferences before and after an information treatment. We also tested the interaction effect between two labels belonging to two different domains (social and environmental). By using a latent class model, we identified subgroups in the sample's preferences. Despite the analysis not allowing for generalisation to the entire population, exploratory analyses on new labels are crucial for understanding how the market could potentially divide, determining consumer acceptability and defining preliminary insights, both political and marketing-related.

We focus on the Italian fruit and vegetable sector for two reasons. Firstly, because the per capita consumption of F&V in Italy is the highest in Europe, it represents a key component of the diet of Italians, and the EU's F&V production is concentrated in Spain, Italy, France, and Greece (Baselice et al. 2017; Nomisma 2021). Secondly, the structural and production characteristics of the F&V sector, in which farm work is less mechanised, require more workers for specific and short periods of the year, which makes these workers more vulnerable to labour exploitation and illegal recruiting.

We make original contributions to the existing literature. First, our analysis focuses on consumer preferences for ethical labels certifying respect for workers' rights in the Italian F&V sector. Second, we estimate Italian consumers' willingness to pay for an ethical label for which Italian policymakers have initiated the regulatory path to establish its introduction. Third, collecting respondents' choices after providing information on the QAW label enables us to estimate consumers' preferences before and after an information treatment, providing further useful hints on the prospective effects of promotion and information campaigns about the new label.

The paper is organised as follows: Sect. 2 describes the experimental design and the data analysis procedure, Sect. 3 presents the results and discusses findings, and Sect. 4 presents conclusions and considers study limitations and future research perspectives.

Materials and methods

The discrete choice experiment methodology

A discrete choice experiment was used to investigate consumer preferences regarding a hypothetical 'Quality Agricultural Work' label. According to the literature, the CE attributes chosen are significant in consumers' F&V purchasing processes. The analysis will take into account characteristics like geographical origin and price (Bond et al. 2008; Meas et al. 2015; Onozaka and McFadden 2011; Tikkanen 2014). The 'organic' label is

Table 1 Choice experiment attributes

Attribute	Explanation	Levels
Geographical origin	Geographical origin of the product	Local Italy Foreign origin
Organic certification	Products compliant with organic production methods	Certification NO certification
'Quality Agricultural Work' label	Products from farms distinguished by compliance with labour regulations, social legislation, and income and value-added taxes	Ethical label NO ethical label
Price	Price €/Kg	0.45 €/Kg 0.90 €/Kg 1.35 €/Kg

included among the attributes due to its importance and recognisability. This will enable comparisons between the two (social and environmental) labels (De Magistris and Gracia 2008; Gorton et al. 2021; Van Loo et al. 2015).

Table 1 describes the attributes used in the choice experiment and their levels. The paper focuses on watermelon, a product often involving informal labour due to the limited mechanisation of agricultural activities, requiring more seasonal workers in specific and short periods of the year. Italian watermelon production ranks fifth among European countries, with a total of 669,950 tonnes in 2022. The Lazio region is the biggest producer, consisting of more than 20% of the total Italian watermelon production area and harvesting 103,950 tonnes a year, an increase of 9% from 2018 to 2022 (I.Stat 2023). Although a QAW label does not currently exist, we addressed this research gap by performing a hypothetical experiment. Discrete choice experiments are consistent with the Lancaster theory of consumer demand (Lancaster 1966) and random utility theory (McFadden 1974) and are one of the most popular stated preference methods used in applied economics (Piracci et al. 2022). This method is used extensively in researching consumer preferences in the valuation of public and private goods (Alcon et al. 2020).

We created a fractional D-efficient design consisting of eight choice sets with two options each and a 'no choice' alternative. The design was divided into two sections so that each respondent faced four choice sets at a time. An example of a choice set is presented in Fig. 1.

A graphic summary of the experimental design, which consists of two consecutive phases with different information levels, is shown in Fig. 2. In the first phase, declared preferences for watermelon without preliminary information were collected, while in the second phase, the interviewees were informed. The information given to respondents included a clear and concise message on the QAW project and the resulting ethical label.¹ Other studies have used the informative method to compare pre- and post-information results or to reduce the potential bias of not knowing or

¹ "The Italian region encourages agricultural and agrifood businesses to register with the "Quality Agricultural Work" network, established by the INPS in reaction to the phenomenon of caporalato in our country's agricultural sector. The issue of undeclared and irregular work could be addressed by creating a "whitelist" of QAW-registered companies. By providing quality/ethical labels due to the non-use of undeclared work, the network aims to give companies a privileged perspective, even in large distribution networks."




	Product A	Product B	None of these
<i>Geographical origin</i>	Italy	Foreign origin	
<i>Organic Certification</i>	 NO certification	 Certification	
<i>Quality Agricultural Work Label</i>	 NO certification	 Certification	
<i>Price (€/Kg)</i>	0,90 €	1,35€	

Fig. 1 Choice set example

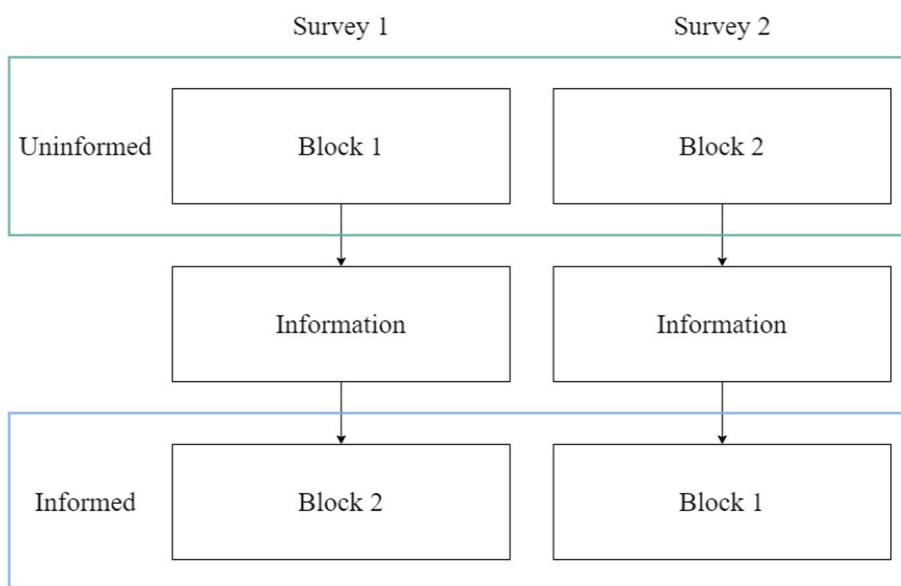


Fig. 2 Experimental design

understanding some CE attributes (e.g. Alcon, et al. 2020; Blasi et al. 2023; Natali et al. 2022; Onozaka and McFadden 2011).

The survey consisted of four sections. In the first section, the respondents indicated their preferences for each of the four choice sets without having received any preliminary information. The second section contained questions aimed at understanding the importance of some attributes in purchasing processes and the interviewees’ frequency of fruit and vegetable consumption. In the third section, the respondents were provided with QAW label information and again indicated their preferences in the CE. Socio-demographic data were collected in the fourth section. The two blocks

obtained through the D-efficient design were alternated in Survey 1 and Survey 2 so that the respondents did not answer the same questions twice.

Sample characteristics and fruit/vegetable consumption preferences

Data were collected using a convenience sample of Italian F&V consumers through a web-based survey from June 2022 to April 2023. This sampling is not a probabilistic approach, and the study is not representative of the Italian population. The total sample includes 324 responses. The descriptive statistics of the main socio-demographic and attitudinal variables are shown in Table 2.

Slightly more than half of the respondents are female, as is the case with the Italian population. The sample represents all socio-demographic categories well, with a slight predominance of younger and well-educated respondents. 52% of the respondents are employees, while around 15% are either freelancers or students. Almost 80% of the sample belongs to a household with 2–4 members. In purchasing F&V, they are mainly influenced by the healthiness and origin of the product, while the certifications have a value slightly higher than the average value of the Likert scale. Over 90% of the sample buys fruit and vegetables weekly, confirming the high propensity of Italian consumers to consume F&V (Nomisma 2021). It is interesting to note that the interviewees show knowledge of unfair working conditions (UWC) in the agricultural sector, as demonstrated by the average value of the related demand.

Empirical approach

For the purposes of the study and to analyse consumer preferences in F&V consumption considering heterogeneity, two models were developed: the mixed logit model (MXL) and the latent class logit model (LCLM). Therefore, the choice experiment data were analysed within a random utility framework, wherein an individual *i* is assumed to choose the alternative that gives the highest utility among *j* alternatives at a given choice occasion *t*. The utility function takes the following form:

$$U_{ijt} = V_{ijt} + \varepsilon_{ijt} \tag{1}$$

where V_{ijt} is the deterministic component, and ε_{ijt} is the random component. The random term ε is assumed to have an independent, identically distributed extreme value distribution.

Mixed logit model

A mixed logit model was applied to estimate consumers’ preferences and willingness to pay. The MXL accounts for preference heterogeneity by allowing parameters to be distributed randomly among the sample population so that all individuals have their preferences. In applying the mixed logit model, we used a linear and additive utility function as follows:

$$U_{ijt} = ASC + \beta_{1i}Foreign_{ijt} + \beta_{2i}Local_{ijt} + \beta_{3i}QAW_{ijt} + \beta_{4i}Organic_{ijt} + \beta_{5i}QAW * Organic_{ijt} + \beta_{6i}QAW * Local_{ijt} + \beta_{7i}QAW * Foreign_{ijt} + \beta_{8i}Price_{ijt} + \varepsilon_{ijt} \tag{2}$$

Table 2 Descriptive and summary statistics of the variables ($n = 324$)

Variables	Categories	Sample	Italy (%)
<i>Demographic variables</i>			
Gender (%)	Female	52.78	51.30
	Male	47.22	48.70
Age (years) (%)	18–29	37.04	17.1
	30–49	24.69	30.9
	50–64	31.17	27.4
	64+	7.10	24.6
Education (%)	High school or lower	42.59	
	High education level	46.60	
Income (%)	Low (< 500–1499)	55.25	
	Medium (1500–2499)	33.95	
	High (> 2500)	10.80	
Work (%)	Freelance	14.51	
	Employee (public/private)	52.47	
	Retired	9.26	
	Household/wife	5.25	
	Unemployed	2.16	
	Student	16.36	
	HHsize (%)	1	7.72
	2	21.60	
	3	24.69	
	4	35.49	
	5 or more	10.50	
Children (0–12 years old) (%)	0	85.19	
	1	10.11	
	2	3.7	
	3	0.62	
	4 or more	0.93	
<i>Attitudinal variables</i>			
Purchasing habits ¹	Healthiness	3.78	
	Convenience	3.30	
	Provenience	3.57	
	Price	3.39	
	Certification presence	3.03	
Frequency of F&V consumption	Once a month or less	1.54	
	Once every 2 weeks	6.79	
	Once a week	52.47	
	Several times a week	39.20	
Person purchasing F&V	Interviewee	32.41	
	Interviewee + another family member	47.22	
	Other family member	20.37	
Purchasing place	Market	12.96	
	Fruit seller	29.54	
	Supermarket	51.85	
	Directly on the farm	4.32	
	Other	0.93	
UWC—How widespread do you think the problem of undeclared work in agriculture is? ¹		4.09	

Source: own elaborations

¹ Data are expressed as an average score on a Likert scale of 1–5 (1 = not at all–5 = at all)

where *ASC*, the ‘alternative specific constant’, is a dummy variable that takes the value 1 when the choice is the no-buy option. The origin attribute consists of three levels (foreign, Italian and local). In our model, Italian origin is taken as the base category. Therefore, *Local* is a dummy variable assuming the value 1 if the watermelon is produced in a local area and 0 otherwise, and *Foreign* is a dummy variable that takes the value 1 if the watermelon comes from abroad and 0 otherwise. *Organic* is a dummy variable that takes the value 1 for organic watermelon and 0 otherwise. *QAW* is a dummy variable that takes the value 1 if the product is produced by a labour-regulation-compliant farm and 0 otherwise. Price *Price* is the variable referred to as the price attribute. To further examine the potential accumulation or substitution effect between the social and environmental labels, we created an interaction between the *QAW* label and *Organic* certification. Since undeclared labour might be linked to place of origin, we also considered the interactions between the origin variables and the *QAW* label.

Once the parameters are estimated, it is possible to compute the marginal WTP for each considered attribute, that is, the marginal rate of substitution between the attribute and the price. The WTP was calculated by taking the ratio of the attributes’ coefficients (β_a) and the mean price coefficient (β_p):

$$WTP_a = -\beta_a / \beta_p \tag{3}$$

Latent class logit model

The latent class logit model represents an extension of the traditional conditional logit model that includes the estimate of the heterogeneity of preferences. In fact, starting from the sample, the LCL creates subgroups of individuals assuming a constant β vector within each, identical homogeneous coefficients, and heterogeneity between different groups of individuals, β , which varies between groups (Greene and Hensher 2003; Hess et al. 2008; Shen 2009). The model applies the expectation–maximisation algorithm for the maximum likelihood estimates (Bhat 1997), which renders the coefficient estimates without standard errors (Pacifico and Yoo 2013; Yoo 2020). An individual *i*, belonging to class *s*, has a probability of choosing alternative *j* in the set of choices *t* equal to:

$$P_{i/s} = \frac{\exp(\beta'_s x_{ijt})}{\sum_{k=1}^J \beta_s x_{ikt}} \quad s = 1, \dots, S \tag{4}$$

where *s* is the number of classes and β is the fixed parameter vector associated with class *s*. The optimal number for *s* is chosen by selecting the model that minimises the AIC and BIC indices (Shen 2009; Louviere et al. 2000).

Results and discussion

Mixed logit model results

The MXL estimates for uninformed and informed choices are shown in Table 3. There are some interesting differences between the choices of uninformed and informed consumers in terms of WTP.

As expected, the price coefficient is statistically significant and negative, meaning that the probability of choice decreases as the price increases. The negative coefficient of the

Table 3 Estimation results for mixed logit models

Variable	Pre-informative		Post-informative	
	Coeff	p value	Coeff	p value
<i>Mean</i>				
Price	− 0.95*** (0.19)	0.000	− 1.30***(0.23)	0.000
ASC	− 2.31**(0.25)	0.000	− 2.12*** (0.27)	0.000
<i>Origin</i>				
Foreign (base = Italy)	− 1.18*** (0.28)	0.000	− 1.25*** (0.33)	0.000
Local (base = Italy)	− 0.08 (0.23)	0.972	0.41* (0.25)	0.097
QAW label	0.53* (0.32)	0.094	1.47*** (0.35)	0.000
Organic label	0.56** (0.25)	0.026	0.72**(0.28)	0.010
<i>Interaction</i>				
QAW*organic	1.24*** (0.48)	0.009	1.23**(0.50)	0.014
QAW*local (base = Italy)	0.08 (0.41)	0.844	− 0.18 (0.44)	0.684
QAW*foreign (base = Italy)	− 0.89* (0.48)	0.055	− 0.66 (0.51)	0.189
<i>St. dev. of parameters</i>				
QAW label	1.28*** (0.19)	0.000	1.42*** (0.21)	0.000
Organic label	1.07*** (0.19)	0.000	1.40***(0.20)	0.000
QAW*organic	0.11 (0.64)	0.864	− 0.24 (0.50)	0.635
Local (base = Italy)	0.85** (0.34)	0.013	0.50 (0.46)	0.273
Foreign (base = Italy)	1.20*** (0.27)	0.000	1.73*** (0.29)	0.000
LR chi2(5)	44.60		74.45	

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The sign of the estimated standard deviations is irrelevant: interpret them as being positive

Source: own elaborations

ASC variable indicates the negative utility associated with not choosing either of the two watermelon options.

Considering the geographical origin and Italy as the base category, the results confirm that Italian consumers’ preferences tend towards local and Italian products that they associate with quality. It might derive from lesser confidence regarding food products from other countries as they may not have been subject to the same regulations as Italian products (Natali et al. 2022). Unexpectedly, the local origin variable is statistically significant and positive only in the post-informative session. This led us to investigate the place of origin through standard deviation analysis and the LCLM model to identify heterogeneity among consumers’ preferences.

The significant coefficients of both organic and social certifications indicate that consumers are generally more likely to purchase certified products (Aitken et al. 2020; Grunert et al. 2014; Van Loo et al. 2015). Since the multidimensional attributes, in terms of environmental sustainability, health and safety, are perceived by consumers for organic products, uniformed and informed consumers prefer products with an organic certification, demonstrating that this certification is established and successful for a significant share of consumers.

The results related to the QAW label provide useful insights into how markets and policy might evolve in response to social requests. Both models show that the QAW label’s positive and significant coefficient indicate that consumers, informed or uninformed, are more inclined to buy certified products (Aitken et al. 2020; Cecchini et al. 2018; Grunert

Table 4 WTP estimation results

	Pre-informative	Post-informative	Δ % (post/pre-info)
QAW label	0.56 (− 0.10–1.23)	1.13 (0.53–1.72)	+ 101.79
Organic certification	0.59 (0.04–1.14)	0.55 (0.1–0.98)	− 6.78
QAW*Organic	1.32 (0.29–2.34)	0.94 (0.19–1.70)	− 28.79

Lower and upper limits in parentheses

Source: own elaborations

2011; Williams and Horodnic 2019; Van Loo et al. 2015). The sign and significance of the organic label confirm it. Moreover, interaction terms between the QAW label and, respectively, organic certification and place of origin show further evidence. The positive and significant values of the interaction term between QAW and organic certifications demonstrate that the two selected labels are perceived as complementary in the F&V sector, applying to different aspects (social and environmental) of sustainability. This result contrasts with the substitution effect between organic and fair labour labelling found by Piracci et al. (2022) in the Italian wine sector. A plausible explanation for this difference might derive from various cases of labour exploitation in the Italian F&V sector that, drawing widespread attention from the Italian public and media, led consumers to perceive irregular work as a real issue, particularly in the fruit and vegetable sector.

Interaction terms between geographical origin and the QAW label variables are not significant, except for the foreign origin in the pre-informative model, which has a negative sign compared to our benchmark variable (interaction between Italian origin and social certification). Although the fair-trade issue is often considered relevant for products imported from developing countries (Akaichi et al. 2016; Poelmans and Rousseau 2016), respondents also acknowledge a higher price premium for national products with fair labour labels.

Most standard deviation parameters are statistically significant, indicating the presence of heterogeneity in the respondents’ preferences and the importance of using a mixed regression model.

In the pre-informative and post-informative models, the standard deviation of the QAW label and organic certification denotes a high variability of the parameters’ distribution across the population, while interaction between the two variables is not statistically significant. This highlights the strong heterogeneity in consumers’ preferences for organic and social labels; however, the complement effect between the two certifications is unanimously perceived by Italian consumers. The variables related to the place of origin show moderate variability. Heterogeneity among respondents’ preferences will be investigated through latent class model estimates.

Willingness to pay results

The mixed logit model allowed us to calculate the WTP for each selected attribute, as reported in Table 4. It is worthwhile pointing out that, in the informed consumers’ sample, WTP for the organic certification slightly decreased by 6.78% (0.59 €/kg for

uninformed vs. 0.55 €/kg for informed), while the QAW label decisively increased WTP after the information treatment (0.56 €/kg for uninformed vs. 1.13 €/kg for informed). This result might indicate that: i) the information has been received as valid, and consumers have placed their trust in the ethical label; ii) respondents perceive informal work as a relevant issue in the agricultural system, and there is a potential interest in an ethical labour label. In addition, the interaction terms between organic and fair labour certifications decreased WTP by 28.79%. These results might derive from labour exploitation, which has drawn widespread attention from the Italian public and media in the last few years. Our findings confirm that the implementation of a social certification may prove effective, given growing public concern and consumer awareness (Piracci et al. 2022). The results of a latent class model are reported in the next section to identify potential market segments interested in QAW certification.

Latent class logit model results

The sample of informed respondents was used to perform a latent class model to identify homogeneous groups of consumers with the same characteristics. Akaike's information criterion (AIC) and the Bayesian information criterion (BIC) were used to determine K , the optimal number of classes (Yoo 2020). We compared the main statistics for the latent class model with two, three and four classes. The best fit was identified by subdividing the sample into three classes ($K=3$).

According to scientific evidence, the probability of belonging to each group can be defined by using socio-demographic variables (gender, age, education level, and income), as well as familiarity with the product/issue investigated in the research (Campbell et al. 2004; Natali et al. 2022; Palma et al. 2016; Rossi et al. 2022; Teuber et al. 2016). The research utilises the frequency of fruit and vegetable purchases and awareness of UWC as a proxy for familiarity. Heterogeneity for the ASC variables was not considered in the LCLM. Table 5 shows the latent class logit model estimations. Each class is characterised by a specific preference structure. The groups are labelled according to the most relevant characteristics that emerge within each group. Class 1 is the largest, as 46% of the respondents fall into this group. Based on the relevance of the different attributes for the members of Class 1, they might be called '*green and healthy*' consumers. In fact, respondents of this group show high interest in organic products, given that Class 1's coefficient for organic certification is the highest. It is well established in the literature that customers perceive an organic product as not only environmentally sustainable but also healthier than a conventional product (Apaolaza et al. 2017; Di Vita et al. 2021a; Piracci et al. 2022). This result is consistent with earlier studies that demonstrate Italian consumers are aware of production practices and environmental problems with regard to the F&V Italian market. (Cembalo et al. 2013; Di Vita et al. 2021a; Migliore et al. 2015b). Class 1 contains a higher proportion of male and more educated respondents, and its members prefer Italian and local products.

While the members of Groups 2 and 3 are primarily younger, less educated, and wealthier than those in Group 1, other factors also play a role in shaping their preferences.

Group 2 contains 45% of the sample. Compared to Group 1, they are younger, have higher incomes, and have a lower educational level. This group's results allow us to define

Table 5 Estimation results for latent class logit models

Variables	Group 1 'Green and healthy' consumers		Group 2 'Local is the best' consumers		Group 3 'Italian fair labour' consumers	
	Coeff (SD)	p value	Coeff (SD)	p value	Coeff (SD)	p value
Price	− 1.069 (0.312)	0.001	− 0.651 (0.253)	0.010	− 4.045 (0.633)	0.000
Foreign	− 1.637 (0.404)	0.000	− 0.155 (0.250)	0.536	− 5.758 (2.084)	0.006
Local	− 0.007 (0.259)	0.977	0.537 (0.290)	0.064	− 1.013 (0.517)	0.050
QAW label	0.640 (0.223)	0.004	1.812 (0.282)	0.000	2.922 (0.675)	0.000
Organic certification	1.763 (0.395)	0.000	− 0.240 (0.257)	0.351	0.263 (0.444)	0.553
ASC	− 2.336 (0.217)	0.000	− 2.336 (0.217)	0.000	− 2.336 (0.217)	0.000
<i>Covariates</i>						
Female	0		0.134 (0.567)	0.813	0.275 (0.572)	0.631
Age	0		− 0.056 (0.023)	0.013	− 0.076 (0.023)	0.001
Educational level	0		− 1.448 (0.502)	0.004	− 1.506 (0.515)	0.003
Income	0		0.589 (0.199)	0.003	0.694 (0.205)	0.001
F&V purchasing frequency	0		− 0.016 (0.377)	0.966	0.014 (0.381)	0.970
UWC	0		− 0.482 (0.356)	0.175	+ 0.462 (0.359)	0.068
Constant	0		9.209 (3.515)	0.009	9.442 (3.540)	0.008
π	0.463		0.454		0.083	

Standard errors in parentheses

Source: own elaborations

it as the 'local is the best' consumers. Consumers in this group pay particular attention to local products and also consider social certification, which might be strictly related to the consumers' emphasis upon the locality of production, to which health and food security and social connection elements are added (Gilg and Battershill 1998; Di Vita et al. 2021b; Meyerding et al. 2019; Naspetti and Bodini 2008). Sentiments such as trust, respect, and sociality generate obligations and responsibilities among farmers and consumers, leading to local products being seen as 'authentic' (Conner et al. 2010; Migliore et al. 2015a; Yue and Tong 2009).

The third group is the smallest of the sample (8.3%) and consists of consumers who are strongly interested in the QAW label and price and prefer Italian products. They could be defined as 'Italian fair labour' consumers. Its members are more aware of unfair working conditions in the agricultural sector. This evidence is consistent with other studies, such as that of Teuber et al. (2016), who point to familiarity as an important proxy that can influence the degree of participation in surveys. Although the social responsibility of farms appears to play a relevant role in food purchasing choices of Italian consumers (e.g. Cembalo et al. 2012), our findings are consistent with market segmentation conducted by Piracci et al. (2022), in which the smallest consumers class reported the

highest propensity to choose the fair labour label. This might imply that a higher interest for QAW label concerns mainly consumers who give more importance to public values such as fairness of the production systems (Maaya et al. 2018).

Limitations

Our paper has some significant limitations that need to be pointed out. Due to the non-probability quota sampling approach, our sample cannot be taken as representative of the entire Italian population. Our research acts as a starting point, offering preliminary insights to policymakers to introduce the new QAW label successfully in the F&V sector. As suggested by Grunert et al. (2014), the numerous labels in the market might cause confusion, hesitation, and mistrust among consumers. As a consequence, the stated preference methods used in our experimental design may produce either overestimations or underestimations of the declared WTP values (Blasi et al. 2023; Iliyasu and Etikan 2021; Loomis 2014; Natali et al. 2022). We implemented some mitigation strategies to handle this hypothetical bias (Haghani et al. 2021). We developed a cheap-talk script to make our respondents aware of the hypothetical bias and included a solemn oath at the beginning of the survey, binding consumers to give us honest answers throughout the interview. We also introduced an opt-out option in our experimental design to avoid forcing respondents to choose between two unwanted products. Despite our efforts to reduce hypothetical biases, they cannot be completely excluded (Carlsson et al. 2005; Haghani et al. 2021; Tonsor and Shupp 2011). It is important to highlight that WTP estimates aim to identify plausible trends, not precise numbers. Our findings for a single product can be improved and enriched by examining how consumers' attitudes towards ethical labels could vary depending on the product investigated. Finally, market segmentation analysis, which is based on respondents' socio-demographic characteristics of a non-representative sample, is merely an attempt to better understand the source of preferences heterogeneity of our sample for a potential fair labour certification and compare it with the findings present in the literature. However, it is critical to emphasize that it is not representative of the Italian population preferences.

Conclusions and policy implications

Conclusions

Among the direct and indirect policy measures employed to tackle undeclared work in Italian agriculture, the 'Quality Agricultural Work Network' represents an interesting approach to producing a 'whitelist' of farmers compliant with labour conditions and offering incentives for those on this 'whitelist'. Although the current configuration of the network presents some problems related to the voluntary nature of membership, Italian policymakers aim to establish a system of real incentives. Introducing a QAW ethical label to guarantee a price premium for products certified with fair labour claims might represent a relevant encouragement to participate in the Quality Agricultural Work Network.

We contribute to this debate by investigating Italian consumers' preferences for a hypothetical QAW label in the watermelon sector. Our objective was to estimate, in terms of willingness to pay, the extent to which social sustainability influences consumer decisions, the potential (complement or substitute) interaction with environmental

sustainability certification, and the market segmentation mechanisms of the QAW label on WTP. In addition, we provided the respondents with essential information on the QAW label to enable us to compare the model results before and after an information treatment.

The results indicate that consumers are generally more likely to purchase certified products from domestic and local sources. Consumers' preference towards organic products confirms that 'organic' is an established and successful certification for a significant share of consumers. The hypothetical QAW label received a similar price premium to organic certification from pre-informed respondents. After administration of the information treatment on the Quality Agricultural Work label, WTP for fair labour certification decisively increases, indicating that the QAW label is a response to social requests and that there may be a market space for it.

The positive and statistically significant value of the interaction term between the QAW label and organic certification implies that environmental and social sustainability claims are perceived as complementary by Italian consumers in contexts where both dimensions of sustainability are relevant.

Standard deviation analysis and latent class model estimates indicate a wide range in the distribution of WTP for organic and social labels and place of origin, which illustrates the heterogeneity in consumer preferences. We found some consumer typologies that can be useful for developing marketing and communication strategies.

Policy implications

To our knowledge, this work represents the first explicit attempt to assess Italian consumers' preferences for QAW ethical labels, providing effective information and support to national policymakers regarding introducing the scheme. However, as evidenced in the limitations section, our paper deals with hypothetical bias, which may lead to WTP overestimation and uses a non-probability sampling approach.

Our results show that consumers would pay a high price premium for fruit produced under fair working conditions, indicating that there may be a market space for the QAW label. Moreover, although social concerns are often disregarded in favour of environmental aspects, consumers interviewed in our research perceived environmental and social sustainability claims as complementary. This implies that in contexts where both dimensions of sustainability are relevant, they should be equally weighted in the implementation of legislative acts and policy tools aimed at pursuing sustainability.

It might be useful to employ a multistakeholder approach where both policymakers and food system stakeholders play a relevant role in the legislative process of creating a successful ethical label that achieves the twofold objective of reducing the use of irregular labour and remunerating participating farmers in terms of a price premium. In fact, various aspects should be considered for the successful creation of a social sustainability label. Fiscal incentives and advantages in public calls for tenders to farms which adhere to the scheme might represent relevant motivations. Moreover, it would be crucial that the price premium associated with the QAW label is fairly distributed along the supply chain to give farmers further incentive to enter the labelling scheme.

Information and education campaigns focusing on the relevance of buying products certified with fair labour labels are crucial to improving consumer knowledge in

decision-making. Moreover, since, in recent years, the various cases of *caporalato* and illegal labour in Italy have made headlines in other EU countries where Italy exports agricultural products, it might be interesting to investigate foreign consumers' preferences regarding Italian products. If a high willingness to pay for products certified with a QAW label emerges, promotional campaigns could be extended to other EU countries.

Abbreviations

ASC	Alternative specific constant
CE	Choice experiment
F&V	Fruit and vegetable
LCLM	Latent Class Logit Model
MXL	Mixed Logit Model
QAWN	Quality Agricultural Work Network
QAW	Quality Agricultural Work
WTP	Willingness to pay
UWC	Unfair working conditions
AIC	Akaike's information criterion
BIC	Bayesian information criterion

Acknowledgements

Not applicable.

Author contributions

Eleonora Sofia Rossi contributed to conceptualization, methodology, data curation, formal analysis, and writing—original draft. Luca Cacchiarelli was involved in conceptualization, methodology, data curation, formal analysis, writing—original draft, and writing—review and editing. Simone Severini contributed to conceptualization, validation, and writing—review and editing. Alessandro Sorrentino was involved in conceptualization, validation, and writing—review and editing. All authors read and approved the final manuscript.

Funding

Progetto Lav.Reg.La: Prevenzione del lavoro irregolare nella filiera ortofrutticola laziale: strumenti a sostegno di interventi finalizzati. Gruppi Di Ricerca 2020—Regione Lazio. CUP: J85F21002030002.

Availability of data and materials

Data are available upon request.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Received: 17 October 2023 Revised: 12 April 2024 Accepted: 17 April 2024

Published online: 24 April 2024

References

- Aitken R, Watkins L, Williams J, Kean A (2020) The positive role of labelling on consumers' perceived behavioural control and intention to purchase organic food. *J Clean Prod.* <https://doi.org/10.1016/j.jclepro.2020.120334>
- Akaiichi F, de Grauw S, Darmon P, Revoredo-Giha C (2016) Does fair trade compete with carbon footprint and organic attributes in the eyes of consumers? Results from a pilot study in Scotland, the Netherlands and France. *J Agric Environ Ethics* 29:969–984. <https://doi.org/10.1007/s10806-016-9642-7>
- Alcon F, Marín-Miñano C, Zabalaa JA, de-Miguel, M.D., & Martínez-Paz, J.M. (2020) Valuing diversification benefits through intercropping in Mediterranean agroecosystems: a choice experiment approach. *Ecol Econ.* <https://doi.org/10.1016/j.ecolecon.2020.106593>
- Antonioli F, Severini S, Viganì M (2023) Visa for competitiveness: Foreign workforce and Italian dairy farms' performance. *Eur Rev Agric Econ* 50(1):115–150. <https://doi.org/10.1093/erae/jbab045>
- Apaolaza V, Hartmann P, Echebarria C, Barrutia JM (2017) Organic label's halo effect on sensory and hedonic experience of wine: a pilot study. *J Sens Stud.* <https://doi.org/10.1111/joss.12243>

- Augère-Granier ML (2021) Migrant seasonal workers in the European agricultural sector (Report no. PE 689.347). European Parliamentary Research Service. [https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/689347/EPRS_BRI\(2021\)689347_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/689347/EPRS_BRI(2021)689347_EN.pdf)
- Barberis E, Battistelli S, Campanella P, Polidori P, Righini E, Teobaldelli D, Viganò E (2018) Vulnerability and irregularity of workers in the agricultural sector: perception, determinants, interventions. *Agriregionieuropea* 14(55):10
- Baselice A, Colantuoni F, Lass D, Nardone G, Stasi A (2017) Trends in EU consumers' attitude towards fresh-cut fruit and vegetables. *Food Qual Prefer* 59:87–96. <https://doi.org/10.1016/j.foodqual.2017.01.008>
- Bhat CR (1997) An endogenous segmentation mode choice model with an application to intercity travel. *Transp Sci* 31(1):34–48. <https://doi.org/10.1287/trsc.31.1.34>
- Blackman A, Naranjo M (2012) Does eco-certification have environmental benefits? Organic coffee in Costa Rica. *Ecol Econ* 83:58–66. <https://doi.org/10.1016/j.ecolecon.2012.08.001>
- Blasi E, Rossi ES, Zabala JA, Fosci L, Sorrentino A (2023) Are citizens willing to pay for the ecosystem services supported by Common Agricultural Policy? A non-market valuation by choice experiment. *Sci Total Environ* 1:2–3. <https://doi.org/10.1016/j.scitotenv.2023.164783>
- Bond CA, Thilmany D, Bond JK (2008) Understanding consumer interest in product and process-based attributes for fresh produce. *Agribusiness* 24(2):231–252
- Borrello M, Cecchini L, Vecchio R, Caracciolo F, Cembalo L, Torquati B (2022) Agricultural landscape certification as a market-driven tool to reward the provisioning of cultural ecosystem services. *Ecol Econ*. <https://doi.org/10.1016/j.ecolecon.2021.107286>
- Cacchiarelli L, Carbone A, Laureti T, Sorrentino A (2018) The hedonic contents of Italian super premium extra-virgin olive oils. *Bio Based Appl Econ* 7(3):217–232. <https://doi.org/10.13128/bae-7676>
- Campbell BL, Nelson RG, Ebel RC, Dozier WA, Adrian JL, Hockema BR (2004) Fruit quality characteristics that affect consumer preferences for Satsuma mandarins. *HortScience* 39(7):1664–1669. <https://doi.org/10.21273/HORTSCI.39.7.1664>
- Cangemi V, Pettinelli R (2021) The network contract: an instrument to contrast labour exploitation in agriculture. The Italian case. *Italian Lab Law e J* 14(2):97–118. <https://doi.org/10.6092/issn.1561-8048/13566>
- Carlsson F, Frykblom P, Lagerkvist CJ (2005) Using cheap talk as a test of validity in choice experiments. *Econ Lett* 89:147–152. <https://doi.org/10.1016/j.econlet.2005.03.010>
- Caswell JA, Padberg DI (1992) Toward a more comprehensive theory of food labels. *Am J Agric Econ* 74(2):460–468. <https://doi.org/10.2307/1242500>
- Cecchini L, Torquati B, Chiorri M (2018) Sustainable agri-food products: a review of consumer preference studies through experimental economics. *Agric Econ Czech Republic* 64(12):554–565. <https://doi.org/10.17221/272/2017-AGRIC-ECON>
- Cembalo L, Migliore G, Schifani G (2012) Consumers in postmodern society and alternative food networks: the organic food fairs case in Sicily. *New Medit* 11:41–49
- Cembalo L, Migliore G, Schifani G (2013) Sustainability and new models of consumption: the solidarity purchasing groups in Sicily. *J Agric Environ Ethics* 26(1):281–301. <https://doi.org/10.1007/s10806-011-9360-0>
- Conner D, Colasanti K, Ross RB, Smalley SB (2010) Locally grown foods and farmers markets: consumer attitudes and behaviors. *Sustainability* 2(3):e742–e756. <https://doi.org/10.3390/su2030742>
- Costantini E (2018) Soggiorno, residenza, contratto [Stay, residence, contract]. In P. Campanella (Ed.), *Caritas Italiana: Vite sottocosto, 2° rapporto presidio*. Arachne
- De Magistris T, Gracia A (2008) The decision to buy organic food products in Southern Italy. *Br Food J* 110:929–947. <https://doi.org/10.1108/00070700810900620>
- De Pelsmacker P, Driesen L, Rayp G (2005) Do consumers care about ethics? Willingness to pay for fair-trade coffee. *J Consum Aff* 39(2):363–385. <https://doi.org/10.1111/j.1745-6606.2005.00019.x>
- Delmas M, Gergaud O (2021) Sustainable practices and product quality: Is there value in ecolabel certification? The Case of wine. *Ecol Econ* 183:106953. <https://doi.org/10.1016/j.ecolecon.2021.106953>
- Di Vita G, Vecchio R, Borrello M, Zanchini R, Maesano G, Gulisano G, Brun F, D'Amico M (2021a) Oh my darling clementine: Heterogeneous preferences for sustainable citrus fruits. *Renew Agric Food Syst* 36(6):557–568. <https://doi.org/10.1017/S174217052100017X>
- Di Vita G, Zanchini R, Falcone G, D'Amico M, Brun F, Gulisano G (2021b) Local, organic or protected? Detecting the role of different quality signals among Italian olive oil consumers through a hierarchical cluster analysis. *J Clean Prod*. <https://doi.org/10.1016/j.jclepro.2021.125795>
- Drichoutis AC, Vassilopoulos A, Lusk JL, Nayga RM (2017) Consumer preferences for fair labour certification. *Eur Rev Agric Econ* 44(3):455–474. <https://doi.org/10.1093/erae/jbx002>
- Gilg A, Battershill M (1998) Quality farm food in Europe: A possible alternative to the industrialised food market and to current agri-environmental policies: lesson from France. *Food Policy* 23:25–40
- Gorton M, Tocco B, Yeh CH, Hartmann M (2021) What determines consumers' use of eco-labels? Taking a close look at label trust. *Ecol Econ* 189:107–173
- Greene WH, Hensher DA (2003) A latent class model for discrete choice analysis: contrasts with mixed logit. *Transp Res Part B Methodol* 37(8):681–698. [https://doi.org/10.1016/S0191-2615\(02\)00046-2](https://doi.org/10.1016/S0191-2615(02)00046-2)
- Grunert KG (2011) Sustainability in the food sector: a consumer behaviour perspective. *Int J Food Syst Dyn* 2(3):207–218. <https://doi.org/10.22004/ag.econ.121943>
- Grunert KG, Hieke S, Wills J (2014) Sustainability labels on food products: consumer motivation, understanding and use. *Food Policy* 44:177–189. <https://doi.org/10.1016/j.foodpol.2013.12.001>
- Haghani M, Bliemer MC, Rose JM, Oppewal H, Lancsar E (2021) Hypothetical bias in stated choice experiments: Part II. Conceptualisation of external validity, sources and explanations of bias and effectiveness of mitigation methods. *J Choice Model* 41:10032. <https://doi.org/10.1016/j.jocm.2021.100322>
- Hess S, Ben-Akiva M, Gopinath D, Walker J (2008) Advantages of latent class over continuous mixture models in capturing heterogeneity. European Transport Conference 2008, Noordwijkerhout, Netherlands. <https://aetransport.org/past-etc-papers/conference-papers-pre-2012/conference-papers-2008?abstractId=2974&state=b>

- Ilyasu R, Etikan I (2021) Comparison of quota sampling and stratified random sampling. *Biometr Biostat Int J* 10:24–27. <https://doi.org/10.15406/bbij.2021.10.00326>
- I.Stat (2023) Coltivazioni: Superfici e produzione - dati in complesso - prov [Crops: Areas and production - overall data - prov]. <http://dati.istat.it/Index.aspx?QueryId=37850>
- Lancaster KJ (1966) A new approach to consumer theory. *J Polit Econ* 74(2):132–157. <https://doi.org/10.1086/259131>
- Leccese V, Schiuma D (2018) Strumenti legislativi di contrasto al lavoro sommerso, allo sfruttamento e al caporalato in agricoltura [Legislative instruments to combat undeclared work, exploitation and gangmastering in agriculture]. *Agriregionieuropa* 14(55)
- Loomis JB (2014) Strategies for overcoming hypothetical bias in stated preference surveys. *J Agric Resour Econ* 39(1):34–46
- Loureiro ML, Lotade J (2005) Do fair trade and eco-labels in coffee wake up the consumer conscience? *Ecol Econ* 53(1):129–138. <https://doi.org/10.1016/j.ecolecon.2004.11.002>
- Louviere JJ, Hensher DA, Swait JD (2000) Stated choice methods: analysis and application. Cambridge University Press
- Maaya L, Meulders M, Surmont N, Vandebroek M (2018) Effect of environmental and altruistic attitudes on willingness-to-pay for organic and fair trade coffee in Flanders. *Sustainability*. <https://doi.org/10.3390/su10124496>
- McFadden D (1974) Conditional logit analysis of qualitative choice behaviour. In: Zarembka P (ed) *Frontiers in econometrics*. Academic Press, New York, pp 105–142
- Meas T, Hu W, Batte MT, Woods TA, Ernst S (2015) Substitutes or complements? Consumer preference for local and organic food attributes. *Am J Agric Econ* 97(4):1044–1071
- Meyerding S, Trajer N, Lehberger M (2019) What is local food? The case of consumer preferences for local food labeling of tomatoes in Germany. *J Clean Prod* 207:30–43. <https://doi.org/10.1016/j.jclepro.2018.09.224>
- Migliore G, Schifani G, Cembalo L (2015a) Opening the black box of food quality in the short supply chain: effects of conventions of quality on consumer choice. *Food Qual Prefer* 39:141–146. <https://doi.org/10.1016/j.foodqual.2014.07.006>
- Migliore G, Galati A, Romeo P, Crescimanno M, Schifani G (2015b) Quality attributes of cactus pear fruit and their role in consumer choice: the case of Italian consumers. *Br Food J* 117:1637–1651. <https://doi.org/10.1108/BFJ-04-2014-0147>
- Ministero del Lavoro e delle Politiche Sociali [Italian Ministry of Labour and Social Policies] (2020) Piano triennale 2020–2022. Contrasto allo sfruttamento lavorativo in agricoltura e al caporalato [Three-year plan 2020–2022. Countering labour exploitation in agriculture and gangmastering]. <https://www.lavoro.gov.it/temi-e-priorita/immigrazione/focus-on/tavolo-caporalato/pagine/piano-triennale-2020-2022>
- Moser R, Raffaelli R, McFadden DT (2011) Consumer preferences for fruit and vegetables with credence-based attributes: a review. *Int Food Agribus Manag Rev* 14(2):121–142. <https://doi.org/10.22004/ag.econ.103990>
- Naspetti S, Bodini A (2008) Consumer perception of local and organic products: Substitution or complementary goods? *Int J Interdiscip Soc Sci Annu Rev* 3(2):1833–1882. <https://doi.org/10.18848/1833-1882/CGP/v03i02/52526>
- Natali F, Cacchiarelli L, Branca G (2022) There are plenty more (sustainable) fish in the sea: a discrete choice experiment on discarded species in Italy. *Ecol Econ*. <https://doi.org/10.1016/j.ecolecon.2022.107413>
- Nomisma (2021) Cresce la spesa per frutta e verdura bio nell'anno della pandemia anche se parte del comparto sfugge alle rilevazioni [Spending on organic fruit and vegetables is growing in the year of the pandemic even if part of the sector escapes detection]. <https://www.nomisma.it/cresce-la-spesa-per-frutta-e-verdura-bio-nellanno-della-pandemia-anche-se-parte-del-comparto-sfugge-alle-rilevazioni/>
- Onozaka Y, McFadden DT (2011) Does local labeling complement or compete with other sustainable labels? A conjoint analysis of direct and joint values for fresh produce claim. *Am J Agric Econ* 93:693–706. <https://doi.org/10.1093/ajae/aar005>
- Osservatorio Placido Rizzotto & Flai CGIL (2018) Quarto rapporto agromafia e caporalato [Fourth report on agromafia and gangmastering]. Bibliotheka Edizioni
- Pacifico D, Yoo HI (2013) Iclgit: a stata command for fitting latent class conditional models via the expectation-maximization algorithm. *Stand Genom Sci* 13(3):625–639. <https://doi.org/10.1177/1536867X1301300312>
- Palma M, Ness M, Anderson D (2016) Fashionable food: a latent class analysis of social status in food purchases. *Appl Econ* 49:1–13. <https://doi.org/10.1080/00036846.2016.1194965>
- Piracci G, Boncinelli F, Casini L (2022) Wine consumers' demand for social sustainability labeling: Evidence for the fair labor claim. *Appl Econ Perspect Policy* 44(4):1742–1761. <https://doi.org/10.1002/aep.13260>
- Poelmans E, Rousseau S (2016) How do chocolate lovers balance taste and ethical considerations? *Br Food J* 118(2):343–361. <https://doi.org/10.1108/BFJ-06-2015-0208>
- Rizzo G, Borrello M, Dara Guccione G, Schifani G, Cembalo L (2020) Organic food consumption: the relevance of the health attribute. *Sustainability* 12(3):595. <https://doi.org/10.3390/su12020595>
- Rossi ES, Cacchiarelli L, Severini S, Sorrentino A (2022) An assessment of consumers' preferences on the certification of regular work in fruit and vegetable production [Conference presentation]. LVIII SIDEA Conference, Palermo, Italy
- Russo C, Di Marcantonio F, Cacchiarelli L, Menapace L, Sorrentino A (2023) Unfair trading practices and countervailing power. *Food Policy* 119:102521. <https://doi.org/10.1016/j.foodpol.2023.102521>
- Schleenbecker R, Hamm U (2013) Consumers' perception of organic product characteristics. A review. *Appetite* 71:420–429. <https://doi.org/10.1016/j.appet.2013.08.020>
- Senato della Repubblica [Italian Senate] (2021) Fascicolo Iter Disegno di Legge S. 1835 XVIII Legislatura. Disposizioni per la tutela della dignità dei lavoratori attraverso l'istituzione del marchio etico del lavoro di qualità [Bill 1835 of the XVIII Legislature. Provisions for the protection of workers' dignity through the establishment of an ethical mark for quality work]. <https://www.senato.it/leg/18/BGT/Schede/FascicoloSchedeDDL/ebook/53044.pdf>
- Senato della Repubblica [Italian Senate] (2023) Fascicolo Iter Disegno di Legge S. 692 XIX Legislatura. Disposizioni per la tutela della dignità dei lavoratori attraverso l'istituzione del marchio etico del lavoro di qualità [XIX Legislature, DDL no. 692. Provisions for the protection of the dignity of workers through the establishment of an ethical mark for quality work]. https://olympus.uniurb.it/index.php?option=com_content&view=article&id=30715&catid=245&Itemid=142

- Seo S, Ahn HK, Jeong J, Moon J (2016) Consumers' attitude toward sustainable food products: ingredients vs. packaging. *Sustainability* 8(10):1073. <https://doi.org/10.3390/su8101073>
- Shen J (2009) Latent class model or mixed logit model? A comparison by transport mode choice data. *Appl Econ* 41:2915–2924. <https://doi.org/10.1080/00036840801964633>
- Sorrentino A, Russo C, Cacchiarelli L (2018) Market power and bargaining power in the EU food supply chain: the role of producer organizations. *New Medit.* <https://doi.org/10.30682/nm1804b>
- Teuber R, Dolgoplova I, Nordström J (2016) Some like it organic, Some like it purple and some like it ancient: Consumer preferences and WTP for value-added attributes in whole grain bread. *Food Qual Prefer* 52:244–254. <https://doi.org/10.1016/j.foodqual.2016.05.002>
- Tikkanen I (2014) Procurement and consumption of local and organic food in the catering of a rural town. *Br Food J.* <https://doi.org/10.1108/BFJ-05-2012-0116>
- Tonsor GT, Shupp RS (2011) Cheap talk scripts and online choice experiments: "looking beyond the mean." *Am J Agric Econ* 93(4):1015–1031. <https://doi.org/10.1093/ajae/aar036>
- Van Loo EJ, Caputo V, Nayga RM Jr, Seo HS, Zhang B, Verbeke W (2015) Sustainability labels on coffee: consumer preferences, willingness-to-pay and visual attention to attributes. *Ecol Econ* 118:215–225. <https://doi.org/10.1016/j.ecolecon.2015.07.011>
- Williams CC, Horodnic A (2019) Tackling undeclared work in the agricultural sector. European Platform on Undeclared Work. <https://www.ela.europa.eu/sites/default/files/2021-09/%27Tackling%20undeclared%20work%20in%20the%20agricultural%20sector%27%20report.pdf>
- Yoo HI (2020) Iclgit2: an enhanced command to fit latent class conditional logit models. *Stand Genom Sci* 20(2):405–425. <https://doi.org/10.1177/1536867X2093>
- Yue C, Tong C (2009) Organic or local? Investigating consumer preference for fresh produce using a choice experiment with real economic incentives. *HortScience* 44(2):366–371. <https://doi.org/10.21273/HORTSCI.44.2.366>
- Zhu Z, Zhang T, Hu W (2023) The accumulation and substitution effects of multi-nation certified organic and protected eco-origin food labels in China. *Ecol Econ* 203:107625. <https://doi.org/10.1016/J.ECOLECON.2022.107625>

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.