

RESEARCH ARTICLE

Consumers behavior towards the country of origin labeling policy: The case of the pasta market in Italy

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Abstract

This study investigates the effect on the demand of pasta following the introduction of the mandatory country of origin labeling for wheat in Italy. This regulation opened a debate between producers, farmers, and consumer organizations on the opportunity posed by this policy. Using an online survey with a choice experiment conducted on 551 Italian pasta consumers, we demonstrated that consumers strongly approve this mandatory policy. This support suggests that place of wheat origin is relevant in driving the pasta choices of consumers and that they are willing to pay a premium price for pasta made with Italian wheat. Moreover, the extra utility that the consumers receive from purchasing pasta made with locally produced wheat is due by their support for the farmers and the agriculture sector [EconLit Citations: D12, Q13, Q18].

KEYWORDS

choice experiment, food policy, mandatory labeling, market power, willingness to pay

Abbreviations: AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion; BTS, Bartlett's Test of Sphericity; CE, choice experiment; COO, country of origin; EU/UE, European Union/Unione Europea; KMO, Kaiser-Meyer-Olkin; PCA, principal component analysis; PL, private label; RPL-EC, random parameter logit with error component; SD, standard deviation; WTP, willingness to pay.

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1 | INTRODUCTION

The semolina dry pasta¹ industry has a prominent role in the Italian agri-food sector. The pasta chain is a complex series of interrelated markets; between the farmers and the consumers, two stages of the processing industry (millers and pasta makers), as well as traders and food retailers, are involved. The Italian pasta chain is characterized by a high degree of concentration at the industrial and retailing stages and by the presence of a market power imbalance along the chain (Cacchiarelli & Sorrentino, 2018, 2019; Ricci et al., 2019). Corresponding to 200,802 producers of durum wheat, with an agricultural area of 1,398,098 hectares (ISTAT, 2016), the processing industry counts around 125 mills, with 3.86 million tonnes of durum wheat flour produced in 2019, and 112 pasta producers (ISMEA, 2021). Owing to the higher degree of concentration in the Italian food retail sector, private label (PL) brands have been bolstering their penetration in the pasta market.

The pasta chain characteristics and, within this, the processing industry's peculiarities have caught the attention of Italian policymakers who decided to introduce a new labeling policy in February 2018 (MIPAAF, 2017). In detail, this regulation requires that the country of origin (COO) labeling for the primary ingredient of semolina pasta—the durum wheat—must be indicated on the pasta package, namely both the country where the wheat was cultivated and the country of milling (in addition to the country of production of the pasta, which is already mandatory).

The effect of introducing this mandatory COO labeling has sparked an ongoing heated debate among the different parties involved in the pasta chain. Supporters of COO labeling, including farmers' and consumers' organizations, have highlighted the consumer's right to higher transparency and food safety as well as the need to support local farmers and the national economy (COLDIRETTI, 2017; Lega Consumatori, 2017). On the other hand, millers' and pasta makers' associations together with some pasta manufacturers have expressed concerns about the regulation, highlighting that these mandatory indications risk confusing the consumers because the place of wheat origin is not an indicator of the wheat's and pasta's quality (ITALMOPA, 2018). Opposing groups have also raised the issue of higher production costs, which result in higher prices for consumers. A spokesman for the Canadian Agriculture Minister has also expressed worry about this regulation, as well as Canadian cereals producers (Reuters, 2017). In fact, Canada is one of the biggest producers of durum wheat in the world and one of the main durum exporters to Italy.

The introduction of mandatory COO labeling for pasta raises several research questions. Can this regulation meet the favor of Italian consumers? Do Italian consumers prefer pasta made with Italian wheat? Does the COO information for wheat on the pasta package increase the consumers' willingness to pay (WTP) for it? In this context, the present study seeks to contribute to the debate on COO labeling by providing empirical evidence on the main effects of this regulation on the Italian pasta market. Drawing upon data from an Italian consumer survey, the present research explores consumers' preference for COO information by means of a choice experiment (CE). The alternatives in the experiment were designed to ensure that the options presented for the place of origin of wheat are the same as those provided by the current legislation. In processed food, a multidimensionality of COO labeling is observed, and it may affect consumer choice (Bienenfeld et al., 2016). This multidimensionality comprises the countries where the raw materials are grown, the country where they are processed, and the nationality of the company that produces the processed foods. However, in our experiment, owing to a twofold reason, we chose to include only the country where the wheat is grown: (i) since Italy is the main producer of pasta, almost all the products sold are generally produced in Italy with wheat milled in Italy. Instead, a large share of the wheat used to produce pasta is imported (ISMEA, 2021). Therefore, the main source of COO labeling is related to the country of origin of wheat. (ii) The country where the raw materials of the product are grown gives the consumers the highest average utilities compared to the other COOs presented on the label, linking the quality of processed foods to the origin of the raw materials (Aizaki & Sato, 2020).

¹Henceforth in this paper, the term "pasta" refers to semolina dry pasta. Semolina dry pasta is the legally recognised name for what Italians usually call pasta.

Therefore, this study aims to assess the consumers' support for this mandatory COO policy by investigating how the consumers perceive pasta made with Italian wheat and estimating the relative importance and WTP attached by the consumers to the COO compared to other food label attributes.

The paper is organized as follows: following the literature review, the "Methodology" section presents the description of the CE, survey, and econometric model. The "Results and Discussion" section reports the sample characteristics, illustrates the outputs, and then presents a discussion on the results obtained. The final section delineates the conclusions along with a discussion on policy and processing industry implications.

2 | BACKGROUND AND LITERATURE REVIEW

2.1 | The Italian pasta chain and the related policy

Pasta is a symbol of Italian cooking as well as Italian identity, and it is a product representative of the global understanding of "Made in Italy." Furthermore, pasta is one of the "cornerstones" of the Mediterranean diet, recognized in 2010 as an Intangible Cultural Heritage of Humanity by UNESCO (United Nations Educational, Scientific and Cultural Organization). Beyond this emblematic role, pasta is a significant component of the Italian agri-food sector. Indeed, Italy is the leading EU state in pasta production and consumption (Cacchiarelli et al., 2016). With 3.6 million tonnes of pasta produced in 2017, Italy accounts for 67% of the total EU production in terms of both volume and value (EUROSTAT, 2018). Moreover, with an average of 23.5 kg per person per year, Italians are the main pasta consumers (ISMEA, 2021).

The structure of the Italian pasta chain causes a high degree of concentration at the industrial and retailing stages, and the market power held by a few companies downstream resulted in the past in instances of unfair and abusive behavior. In 2009, the Italian National Competition Authority sanctioned pasta makers for anticompetitive and unfair trading practices (AGCM, 2009). In fact, from October 2006 to March 2008, the main pasta manufacturers in Italy and their industry associations collectively agreed to restrict competition and coordinate the sales price of pasta on the national market. Because of this cartel, the price that retailers paid for pasta underwent an average increase of 51.8%. This consequence was also faced by the consumers as the retail price increased by 36% over the same period (European Competition Network, 2012).

Given the importance of the pasta supply chain in the agri-food sector, Italian policymakers have taken several policy initiatives. In 2014, the "Cabina di Regia sulla Pasta" was established, a permanent forum for discussion with the groups of stakeholders involved in the pasta chain (MISE, 2014). Among the goals pursued by this forum, the Italian government wanted to reinforce the Italian wheat producers' bargaining power by providing them with an opportunity for vertical differentiation (Belleflamme & Peitz, 2010). This accomplishes a more equitable distribution of the added value in the pasta chain.

At the same time, in 2014, the Italian Ministry of Agriculture, Food and Forestry launched an online survey with the general aim to collect consumers' opinions and information regarding the labeling of different food products, including pasta (MIPAAF, 2015). The survey collected 26,547 respondents who participated voluntarily. The results revealed that the origin of the product (or of the raw materials it was produced with) is a determinant of purchasing, and the respondents considered the country of origin of the wheat (85.2% of the sample) and the country where the wheat was processed and where the pasta was produced (82.9%) as appreciable information for pasta.

Furthermore, considering the results of the national survey, in 2018, the Italian government introduced the mandatory COO labeling for the primary ingredient of semolina pasta—durum wheat (MIPAAF, 2017). As stated by the Minister of Agricultural, Food and Forestry Policies, the goal of this policy is to "give the highest transparency of information to the consumer, thus strengthening the protection of producers and the relationships of one fundamental supply chain for Made in Italy agri-food" (MIPAAF, 2017). The regulation established that pasta marked in Italy must report one of the following indications, relating both the country of wheat cultivation and that

of milling: (i) If the operations are conducted exclusively in one country, the name of that country. (ii) In cases where the operations involve more than one country, it must be indicated as “EU countries,” “non-EU countries,” or “EU and non-EU countries.” (iii) Additionally, if the pasta is made with more than 50% of wheat that originated in one country, the name of that country must be indicated followed by a mention of “and other EU countries,” “and other non-EU countries,” or “and other EU and non-EU countries” (MIPAAF, 2017). The regulation benefits the consumers by guaranteeing them the right to information and providing clear, comprehensible, and legible labeling of foods. This is in line with Regulation No 1169/2011 of the European Parliament and the Council, which states that consumers should be appropriately informed regarding the food they consume to make conscious choices, with particular regard to health, economic, environmental, social, and ethical considerations.

2.2 | The consumer preference for the COO labeling

According to labeling regulations in countries, the indication of the COO of the ingredients on the label can be mandatory or provided on a voluntary basis (Roe et al., 2014). Voluntary labeling represents an opportunity for the producers to increase their profits assuming that this information has a positive effect on the consumer's purchase decision and that the costs associated with it are lower than the revenues (Golan et al., 2001). On the other hand, a mandatory indication of the COO allows for such information to be shared among all the involved stakeholders, and this information would otherwise be available only to the producers or sellers. Therefore, COO labeling can improve the efficiency of the market by reducing asymmetry in information and supporting informed consumption.

Mandatory COO labeling can be a useful tool for policymakers owing to its social welfare consequences such as the reduction of efficiency due to implementation costs and the impact on bargaining power gain (Swinnen, 2020). Indeed, the mandatory labeling policy is not inexpensive as producers must pay the extra costs for labeling, tracking the product origin, and separating products with different origins. Furthermore, regulators are needed to enforce mandatory labeling. These extra costs can be shared among the supply chain members (producers, processors, retailers), and they can also affect taxpayers and be passed along to consumers in the form of higher prices at the retail level (Bimbo et al., 2020; Jones et al., 2009; Roe et al., 2014). Mandatory labels may also introduce trade distortion, or they can be interpreted as a nontariff barrier across countries (Countryman & Bonanno, 2020; Newman et al., 2014).

Several previous studies demonstrated that consumers have a great preference for information related to the origin of food. The COO label may influence the consumer perception of product quality (Lusk et al., 2006; Thøgersen et al., 2019). The beliefs related to the COO depend on the consumers' perception of that country and the emotions and feelings that this country arouses in them (Thøgersen et al., 2017). Through COO labeling, consumers infer evaluations of the quality and other product features such as those related to health, safety, taste, or freshness (Berry et al., 2015; Holdershaw & Konopka, 2018; Lim et al., 2014). Thus, the consumers evaluate unknown traits of a product based on what they know about the object, that is, COO. In this way, the COO label acts as an element from which positive or negative beliefs about a country's image are translated as a positive or negative evaluation of the product itself, hence producing the so-called “halo effect” (Han, 1989). Additionally, several studies have evidenced that the preference for the COO is guided by ethnocentrism, namely that many consumers prefer buying food originating from their own country instead of foreign products (Kilders et al., 2021; Lusk et al., 2006; Van Loo et al., 2019). Moreover, in inferring product quality from a specific COO label, consumers also express their political and/or economic support for a specific country or region (Awada & Yiannaka, 2012), and purchasing national food products can be seen as an act of supporting the farming economy (Chambers et al., 2007). This attitude and preference for COO information often result in a higher WTP for labeled products and a higher WTP for domestic products compared to imported food (Balcombe et al., 2016; Lewis et al., 2016; Newman et al., 2014; Trestini & Stiletto, 2020).

Although previous studies suggest a consensus on the consumer preference for COO labeling, the related results are very heterogeneous, and the sources of this heterogeneity are multiple, that is, the results are product-specific (Balcombe et al., 2016; Plastina et al., 2011) or context-dependent. Studies that solely investigate the product's origin estimate a larger effect of COO labeling compared to those that use other product cues (Lusk et al., 2006). Balcombe et al. (2016) confirmed this observation, stating that in the discrete CE, the value attributed to COO is influenced by the presence or the absence of other quality cues provided to the respondents in the experimental scenario. Gao and Schroeder (2009) demonstrated that by adding additional quality attributes to beef steak alternatives, namely "Guaranteed Lean," the WTP for the COO attribute declined, losing some of its role as an indicator of food quality. The impact of COO labeling decreases when used together with price, brand, and other quality attributes that have a more relevant influence on consumer attitudes and preferences (Newman et al., 2014; Thøgersen et al., 2019). In this sense, the brand acts as a moderator of the COO labeling effect.

2.3 | Consumers' preference for pasta

Several studies have investigated Italian consumers' preference for pasta and their consumption habits. However, COO studies concerning pasta are limited, and in general, scant literature exists on consumers' WTP for the origin of the wheat.

Two qualitative studies (Altamore et al., 2017, 2018) have evidenced that consumers recognize origin as one of the most important features in purchasing choices. These findings were confirmed by Altamore et al. (2020) who highlighted that for a sample of Italian consumers, the credence attributes—such as the origin of the wheat, brand, and price—have a relevant role in the choice of pasta.

In a real CE, Cavallo et al. (2014) ascertained that brand, protein content, sustainable information shown on the label, and lower price positively impact consumers' preferences. However, the local origin of the pasta (expressed as production in Campania, one of the Italian regions traditionally manufacturing pasta) has a negative influence on the consumers' choice.

Using conjoint analysis, Contò et al. (2016) observed that the place of wheat origin is the first attribute strongly affecting the choice of pasta and that Italian origin is preferred not only over an international one but also over regional origin.

In a recent methodological study concerning pasta, Menapace and Raffaelli (2020) collected both state preference data through a hypothetical discrete CE and revealed preference data by analysing actual purchases at grocery stores. They reported that consumers have the highest WTP for wheat of Italian origin, equal to 0.52 euro in the real experiment and 1.52 euro in the discrete CE for a 0.500 kg package of pasta. However, they included the attribute Italian wheat origin in a dichotomous manner as "present/not present" since the experiment was conducted in 2013 before the introduction of mandatory COO labeling for pasta in Italy and, thus, within the existing legislative context.

Therefore, the present study also intends to enrich the literature by conducting an experiment that faithfully mimics the actual legislation on COO labeling in Italy, the greatest producer and consumer of pasta.

3 | METHODOLOGY

3.1 | Survey

The data were collected using an online survey conducted on 602 voluntarily recruited Italian pasta consumers in January 2021. Respondents were randomly recruited through invitations to participate in the online survey by means of the main social networks and email. The questionnaire was distributed via an online survey management

software. Individuals were included if they were over 18 years old. We screened only respondents who had eaten pasta at least once a month in the last year. By entering the survey, participants gave their informed consent for inclusion before they participated in the study.

The survey encompassed a CE and a questionnaire on respondents' shopping behavior and their sociodemographic characteristics. We also measured three domains of attitudinal characteristics: (i) consumers' perception of features associated with pasta made with Italian wheat; (ii) consumers' perception of fairness in the relationships among the players involved in the pasta supply chain; (iii) respondents' interest in COO information on the label. These attitudinal characteristics were measured through several statements. For each statement, the participants were asked to rate their level of agreement using a 5-point Likert scale ranging from "I totally disagree" to "I totally agree." The first two constructs were included for sample descriptive purposes, while the third was included in the model estimation. The statements, as translated from Italian, are presented in Appendix B.

The first group of eight statements is related to consumers' perception of features associated with pasta made with Italian wheat. These were retrieved from Aprile et al. (2016) who evaluated the consumers' perception of local food. The statements were adapted for this study by excluding two statements from the original version. We called this set of items "Italian wheat expectations." As mentioned above, previous studies (Berry et al., 2015; Holdershaw & Konopka, 2018) have evidenced the "halo effect" of COO labeling; in other words, consumers use COO labels as an indication of the pasta's taste or to decide whether it is safe for consumption. In this way, consumers could unconsciously ascribe quality features to pasta not explicated by the COO of the wheat.

An additional set of five statements ("Fairness in the pasta chain") investigated the consumers' perception of fairness in the relationships among the players involved in the pasta supply chain, particularly those at the downstream stages, including the wheat producers. Furthermore, the respondents were asked to evaluate their level of agreement with supporting agriculture with public funds. Some of these statements were retrieved and adapted from Busch and Spiller (2016), while others were developed in accordance with the aim of the present study.

The last group of seven statements, which we called "Interest in the Country of Origin," dealt with the respondents' interest in label information, the rightness of introducing mandatory information regarding the COO of raw materials and the country of production of pasta, and the possibility of origin information disincentivizing the purchase of foreign wheat and pasta made with it. The last statement sought to elicit responses that indicate if the respondents are willing to pay a higher price for pasta made with Italian wheat.

3.2 | CE design

We conducted an online labeled CE as opposed to employing an unlabeled CE that uses generic titles for the alternatives. The choice options were labeled by the respective pasta brands. The decision to conduct a labeled CE was driven by the study's aim to align itself with reality, that is, reproducing a real setting such as a grocery or a supermarket where consumers usually make their choices among branded goods as opposed to generic alternatives (Hensher et al., 2015). This study resorted to a CE due to the convincing evidence that position it as a popular methodology in food marketing to elicit consumers' preference and WTP (see, e.g., Boncinelli et al., 2021; Grashuis & Magnier, 2018; Staples et al., 2020). CE consists of multiple decision scenarios where the participants are asked to indicate their most preferred product between two or more alternatives with different prices, attributes, and attribute levels.

A short script before the choice exercises informed the respondents that the experiment and all the questions correspond to the semolina dry pasta, thus excluding the varieties of pasta such as egg pasta, fresh and frozen pasta, or pasta made with other cereals or raw materials such as spelt or chickpeas. In each choice scenario, we presented four packs of durum wheat semolina pasta (0.500 kg) in the form of "penne rigate" as the options. Penne

rigate is the shortcut pasta most consumed by Italians, preferred only after “spaghetti,”² the long type of pasta (Unione Italiana Food, 2019).

The scenarios presented required the respondents to choose a package of pasta for an ordinary meal. In each choice task, the respondents were asked to choose the alternative they preferred from among four hypothetical packs of pasta with different attributes and prices; a “none-of-these” option was also provided. The inclusion of the “none-of-these” option saves the respondents from having to forcefully choose one of the given options and mimics a realistic shopping experience, where consumers may postpone or even forego the purchase (Atallah et al., 2021; Hensher, 2010).

The choice of attributes and levels are based on previous studies on pasta (Altamore et al., 2020; Cavallo et al., 2014; Contò et al., 2016; Menapace & Raffaelli, 2020) as well as the pasta available on the shelves in the supermarkets. The packages of pasta differ in terms of brand, country of cultivation of wheat, drying process, and price. The experimental design in this study included a full palette of four different real pasta brands, namely three national brands (Barilla, De Cecco, and Divella) and a PL. The country of cultivation of wheat was presented using two levels: “Paese di coltivazione del grano: Italia” (translated from Italian as “Country of cultivation of wheat: Italy”) and “Paese di coltivazione del grano: UE e non UE” (translated from Italian as “Country of cultivation of wheat: EU and non-EU countries”). Even though the Italian regulations allow other mentions regarding the origin of the wheat, as previously described, the two selected levels represent the most common mentions on pasta packages in supermarkets. The attribute “slow dried” identifies a specific production process, and it is commonly presented on pasta packs. In this regard, the drying process is certainly the stage that has a greater influence on the pasta peculiarities, and lower drying temperatures better preserve the characteristics and the flavor of the final product (Giannetti et al., 2021). Four levels of price were included in the experiment to encompass the range of market prices for pasta observed in supermarkets, with specific prices for the national brands (0.69, 1.09, 1.49, 1.89 euro) and four levels for the PL brand (0.29, 0.49, 0.79, 0.99 euro). The definitions of attributes and levels are shown in Table 1. We included a cheap talk script before the choice questions to reduce the effects of hypothetical bias typically present in the stated preference studies (Lusk, 2003). Our cheap talk script is adapted from that of Dominici et al. (2019) and is reported in Appendix A.

The pasta market is mainly dominated by a few major producers and PLs. The consumers' preferred brand is one of the main drivers that most affects their decision when purchasing pasta (Cavallo et al., 2014; Contò et al., 2016). The three national brands included in the experimental design respectively represent the top brands in terms of sales value in 2018, accounting for 50.5% of the total sales value (FOOD, 2019). The ensemble of PLs represents 12.1% of the sales value of pasta in 2018 (FOOD, 2019).

Today, most major retailers offer different lines and several price quality tiers of pasta with PLs, such as economy, standard, and premium PLs (Ter Braak et al., 2014). While economy PLs offer lower prices with relatively lower quality than standard PLs, premium PLs are positioned at the top end of the market and offer high-quality characteristics (in terms of ingredients, protected designation of origin, etc.) that enable them to compete with national brands. In the design of the present experiment, we chose the standard PL in instances where the supermarkets include an assortment of different tiers of PLs.

As each supermarket chain currently offers pasta marked with its brand, we decided to differentiate the PL brand shown to respondents according to the supermarket chain where they declared to regularly go shopping for food. For this purpose, we first asked each respondent to indicate the supermarket where he/she regularly goes among a list of eight supermarket chains (Table 2), which represent the top highest-selling supermarket chains in Italy with a total market share of 63.9% in 2019 (Distribuzione Moderna, 2020). Then, the CE was designed in a way that the choice tasks presented each respondent with the PL pasta brand specific to the supermarket chain where he/she declared to regularly go for groceries.

²We used a short pasta format because it has a wider front pack than the long pasta formats; therefore, the choice task images were more pleasing to the eye and allowed for a more comfortable reading of the claims and logos used in the experiment.

TABLE 1 Description of CE attributes and levels.

Attributes	Numbers of levels	Information levels
Brand	4	Barilla, De Cecco, Divella, Private Label
Country of cultivation of wheat	2	Italy, EU and non-EU countries
Drying process	2	Slow dried, none
Price (€)	4	0.29, 0.49, 0.79, 0.99 (for Private Label) 0.69, 1.09, 1.49, 1.89 (for Barilla, De Cecco, Divella)

Note: Brands are alternative-specific attributes.

Abbreviations: CE, choice experiment; EU, European Union.

TABLE 2 Market shares of the supermarkets included in the experiment.

Supermarket chain	Market share (%)
Coop	13.4
Conad	13.3
Selex	10.0
Esselunga	8.9
Eurospin	6.3
Carrefour	5.0
Lidl	4.0
Agorà	3.0
Total	63.9

Note: Data as of September 2019 (source: Distribuzione Moderna, 2020).

In the event that the participant did not find the supermarket where they regularly go shopping for food, a second question followed, asking them which of the eight supermarkets from the previous question can represent a valid alternative for them to shop for food. Those who considered none of these supermarkets as a viable alternative were excluded from the experiment. Following this procedure, 3.32% of all the respondents who had started to fill out the questionnaire were excluded.

To allocate attributes and levels among alternatives, a Bayesian design was generated (Scarpa et al., 2007). Accordingly, we implemented the following three steps: first, we created a D-efficient design with zero priors using the software Ngene. D-efficient designs use the D-error as the criterion to evaluate the efficiency of different alternatives of the same design specification. The D-error is the determinant of the variance-covariance matrix of the design assuming only a single respondent. The design with the lower D-error is higher in efficiency (Rose et al., 2008).





Then, we conducted a pilot survey on 52 respondents (corresponding to 2080 observations)³ to estimate a multinomial logit model. Last, the parameters from this model were used to inform the Bayesian priors for the final D-efficient design. The Bayesian D-error of the final design is 0.48 while the D-error of the design

³There is no predefined rule or formula to establish the minimum sample size for the pilot study (Bliemer & Rose, 2010). Some studies, indeed, use Bayesian priors gathered from very different sample sizes: 23 (Fang et al., 2021), 32 (Thiene et al., 2018), 36 (Bliemer & Rose, 2011), or 78 (Piracci et al., 2022) respondents.

for the pilot study, which was an efficient design with zero fixed priors, was 0.73. The final design consisted of 16 choice tasks split into two blocks of eight choice tasks each, representing a good compromise to limit the fatigue effect of respondents while gathering efficient estimates of a mixed logit model.

Specific prices for the national and PL brands were considered to encompass the range of market prices for pasta observed in supermarkets. To mimic the price relationships normally observed at retail outlets, we set a restriction in the design generation process of the experiment, ensuring that the price of the PL never exceeded the price of the national pasta brands. The final design obtained from the Ngene software was in no case manipulated or altered ex-post.

In the eight choice tasks, the pasta alternatives were presented in a random order to mitigate possible ordering effects in choices. An example of choice task is reported in Figure 1.

BRAND 1	BRAND 2	BRAND 3	PRIVATE LABEL
PENNE RIGATE	PENNE RIGATE	PENNE RIGATE	PENNE RIGATE
Country of cultivation of wheat: ITALY	Country of cultivation of wheat: ITALY	Country of cultivation of wheat: EU and non-EU countries	Country of cultivation of wheat: EU and non-EU countries
			
500 g	500 g	500 g	500 g
€ 1,49	€ 1,09	€ 1,09	€ 0,99
A	B	C	D

Among these alternatives, what would you buy?

- Package A
- Package B
- Package C
- Package D
- None of these

FIGURE 1 A choice task used in the choice experiment (translated from Italian only for publishing purposes). The choice task is translated from Italian only for publishing purposes. Where the gray box with the words “BRAND 1,” “BRAND 2,” and “BRAND 3” are placed, respondents viewed the name of the three national brands selected for the study (in no particular order, Barilla, De Cecco, and Divella). Where the gray box with the words “PRIVATE LABEL” is placed, respondents viewed the name of one of the eight Private Label (PL), according the supermarket chain where they declared to regularly go for groceries.

3.3 | Empirical analysis

The theoretical framework of the CE is rooted in the random utility theory (McFadden, 1973) and the theory of Lancaster (1966). Accordingly, an individual n obtains utility U from choosing an alternative i in the choice situation t :

$$U_{nit} = \beta' X_{nit} + \varepsilon_{njt}, \quad (1)$$

where X_{nit} is the vector of attributes of the i -th Brand, β' is the vector of parameters, and ε_{njt} is the unobserved random error term.

To estimate the parameters of Equation (1), we ran three different models. Model 1 is a Random Parameter Logit with an Error Component (RPL-EC) model that considers the heterogeneity in consumer preferences and accounts for correlation across utilities for the brand alternatives. Our CE design consists of choice sets with five options, four that require a purchase and one that is “nobuy.” The “nobuy” option is experienced by respondents and appears repeatedly in all choice sets. Instead, the experimentally designed alternatives are fictitious and vary across the choice tasks. According to Scarpa et al. (2005), the utilities of the purchasing options are more closely correlated with one another than with the “nobuy” option. These four alternatives share zero-mean-random and normally distributed error components in the utility structure.

Model 1 can be expressed as follows:

$$U_{nit} = asc_{ni} + \alpha_n Price_{nit} + \beta_{1n} ItalianWheat_{nit} + \beta_{2n} SlowDried_{nit} + \eta_{nit}(1-nobuy) + \varepsilon_{njt}, \quad (2)$$

where asc_{ni} is an alternative-specific constant representing the utility of one of the four alternatives ($i = \text{Barilla, De Cecco, Divella, or PL}$) relative to the “nobuy” option. The β -coefficients are normally distributed parameters that capture the main effects related to the attributes included in the experiment. *ItalianWheat* is dummy coded, taking the value of one if the pasta is made with wheat cultivated in Italy, and zero if the wheat is cultivated in EU and non-EU countries. *SlowDried* is a dummy variable, equal to one if the pasta is slow dried, and zero otherwise. α is the utility associated with price, which is modeled as a continuous variable represented by eight price levels with a one-sided triangular distribution (see Hensher et al., 2015 for more details) that forces this parameter to have a negative sign according to economic theory. η_{nit} is the error component that, as mentioned above, is a zero-mean parameter. Finally, ε_{njt} is the error term assumed to be independently distributed with an extreme value distribution.

Model 2 estimates the same specification in Equation (2) in the WTP space. The WTP space specification estimates the distributions of WTP directly (Scarpa et al., 2008). In fact, in the WTP space model, the parameters can be interpreted as marginal WTP for each attribute, contrasting the preference space model where the parameters represent the utility coefficient of each attribute. The rationale behind Model 2 is twofold. First, with Model 2, we can check the consistency of our results according to model specifications. Second, the estimation of the WTP for each attribute is not practicable using the parameters of Model 1 as the price coefficient has a different distribution to the other attributes (Train & Weeks, 2005).

Model 3 inserts in Equation (2) in the WTP space the interaction terms between the attributes and the component scores obtained from a Principal Component Analysis (PCA) on the eight statements of the “Italian wheat expectations” scale. The main goal of this model is to further investigate the determinants of the preference for pasta made with Italian wheat.

The PCA was performed because it allows us to group the information contained in several original variables into a smaller set of new variables called components with a minimum loss of information (Hair et al., 2014). To justify the application of PCA, we examined the correlation among variables by implementing the measure of sampling adequacy, also called Kaiser–Meyer–Olkin (KMO) statistic, and Bartlett’s Test of Sphericity (BTS). The KMO, which takes values between 0 and 1, is acceptable for values above 0.50 (Hair et al., 2014). BTS checks the null hypothesis that correlations among the dependent variables are zero (Hair et al., 2014). The technique of the

latent root criterion, also known as the Kaiser criterion, is used to determine the number of components to extract (Mooi et al., 2018). Accordingly, all the components with an eigenvalue greater than one were retained. To improve the PCA interpretation, an orthogonal rotation method was applied, following the varimax criterion. Regarding the statistical significance of the loadings' values, in sample sizes of 350 respondents or greater, loadings of 0.30 can be considered significant (Hair et al., 2014).

4 | RESULTS AND DISCUSSION

4.1 | Sample characteristics and attitudinal traits

A total of 602 respondents started to fill out the questionnaire. However, we excluded respondents (i) who declared eating pasta less than once a month, (ii) who did not consider the eight supermarket chains as a valid alternative for them to shop for food, and (iii) who did not fill out the questionnaire correctly (i.e., respondents that have written "old man/old woman" instead of his/her age or those who have indicated a number of children in the family higher than the household size). The rationale for using the first criterion of selection is rooted in the need to screen only pasta consumers, excluding occasional consumers or those who are not consumers at all. The second criterion is employed due to the requirement to identify the supermarket chain where the respondents usually shop to present the PL alternative labeled with the supermarket name. The final sample consisted of 551 pasta consumers.

The descriptive statistics of the final sample's sociodemographics are shown in Table 3. It can be observed that 61% of the participants were female, 55% had tertiary education, and 56% were between the ages of 40 and 69, with a median age of 46 years. More than three-quarters of the sample were employed while 20.6% are retired, and the remaining comprised home keepers, students, or unemployed people. Among the respondents, 74% self-reported a satisfactory economic situation, 22% stated some difficulties, and only 4% stated a severe difficulty. Over 85% of the respondents lived in a household comprising more than one person, and in 75% of the cases, no minors under the age of 12 lived in the house.

Some differences exist between the Italian population and the final study sample. Although the assumption that the general population and the target population are largely overlapped is reasonable, they are not the same population. Therefore, some differences in the summary statistics can be ascribed to the differences between the two populations. Compared to the national population, our sample is generally younger and well-educated, has a larger household size, and is pronominally formed by women. However, given that the study was conducted online, it is feasible to anticipate that internet users are young and that they will have higher levels of education.

The survey confirmed that pasta represents a highly familiar food for Italian consumers as 89.5% of the final sample consume it almost once a week. Pasta is eaten daily by 23.6% of the respondents, while 40.3% declare eating it three or more times a week and 25.6% once or twice a week. Only 6.7% of the respondents consume pasta less than once a week, while 3.8% eat it once a month. Among the respondents who self-declare a somewhat difficult economic situation, pasta consumption is more frequent as about 70% of them consume pasta almost three times a week compared to the 60% of those who report a satisfactory economic situation.

Overall, pasta is usually purchased at supermarkets (87.8% of the final sample). Only 5.8% of the respondents buy it at small grocery shops. The rest of the respondents (5.7% of the sample) stated that they purchase pasta using other distribution channels, such as directly from pasta producers, from specialised organic shops, or through community-supported agriculture. Only 0.7% of the sample buy pasta online (excluding the virtual stores of the supermarkets/hypermarkets/discounts), confirming the findings of Dominici et al. (2021) regarding the lower penetration of e-commerce in the grocery sector compared to other consumer goods.

Figure 2 displays the responses for each item of the "Interest in the Country of Origin" scale. Overall, a large share (88.6%, statement A4) declares to be interested in the product origin. Almost all the respondents (99.0%, statement A1) agree that specifying the COO of wheat should be mandatory. Finally, 93.6% and 97.4% think it is

TABLE 3 Sample characteristics (N = 551).

Socio-demographic and economic characteristics	Number of respondents	Sample %	National population %
Gender			
Male	215	39.0%	48.2% ^a
Female	336	61.0%	51.8% ^a
Age			
18–29 years	36	6.5%	14.3% ^a
30–39 years	148	26.9%	13.4% ^a
40–49 years	116	21.1%	17.4% ^a
50–59 years	87	15.8%	18.9% ^a
60–69 years	103	18.7%	14.9% ^a
70 and older	61	11.1%	21.0% ^a
Education			
At least Primary School	3	0.5%	17.5% ^b
Middle School	42	7.6%	27.8% ^b
High School	205	37.2%	37.5% ^b
Bachelor's Degree or higher	301	54.6%	17.2% ^b
Occupational status			
Employed	378	68.6%	
Homemaker	31	5.6%	
Retired worker	114	20.7%	
Student	10	1.8%	
Unemployed	18	3.3%	
Self-assessment of economic situation			
With high difficulty	8	1.5%	
With difficulty	14	2.5%	
With few difficulties	121	22.0%	
With few facilities	187	33.9%	
With facility	165	29.9%	
With high facility	56	10.2%	
Household size			
1	70	12.7%	35.1% ^c
2	186	33.8%	27.1% ^c
3	143	26.0%	18.5% ^c
4	117	21.2%	14.3% ^c
5	27	4.9%	3.7% ^c
More than 5	8	1.4%	1.4% ^c

(Continues)

TABLE 3 (Continued)

Socio-demographic and economic characteristics	Number of respondents	Sample %	National population %
Area of residence			
Urban	404	73.3%	
Rural	147	26.7%	
Size	551	100.0%	100.0%

^aItalian National Institute of Statistics (ISTAT) data, referred to January 1, 2021.

^bISTAT data, for people over 24 years, referred to 2020.

^cISTAT data, referred to 2019.

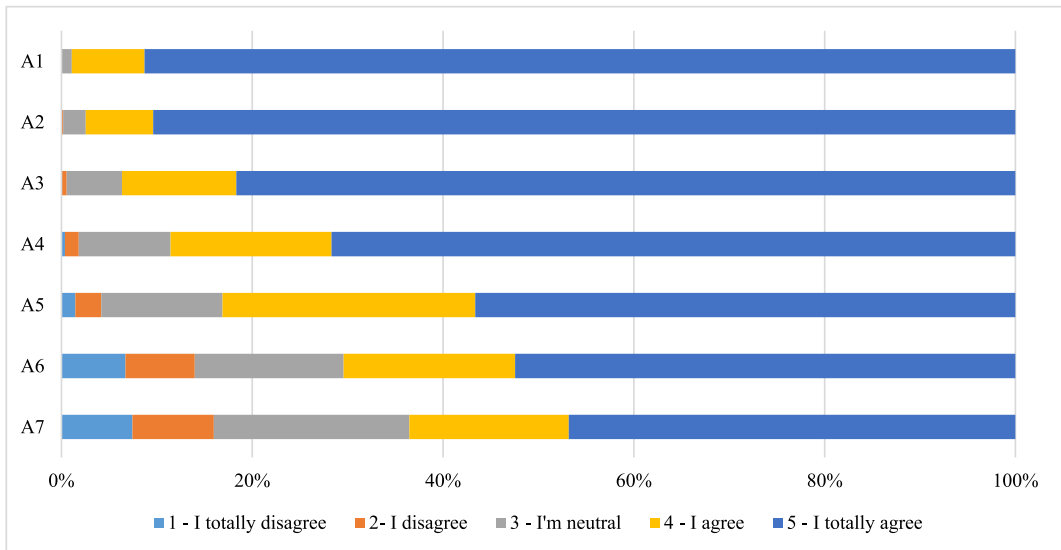


FIGURE 2 Responses to the “Interest in the Country of Origin” scale. A1: I think it is right that it is mandatory to indicate the country of origin of the wheat on the label; A2: I think it is right that it is mandatory to indicate the country of production of pasta on the label; A3: I think it is right that it is mandatory to indicate the country of milling of the wheat on the label; A4: I am interested in product origins; A5 I am willing to pay a higher price for a package of pasta produced only with Italian wheat; A6: I believe that the label indicating the country where durum wheat is grown helps to dissuade the purchase of pasta produced with non-Italian durum wheat; A7: I believe that the label indicating the country where durum wheat is grown helps to dissuade pasta producers from purchasing wheat from other countries.

right to necessarily indicate the country of wheat milling (statement A3) and the country of pasta production (statement A2), respectively. These descriptive results suggest a consensus among Italian consumers regarding the mandatory COO labeling policy and confirm the findings of a survey conducted by the Ministry of Agriculture in 2014 (MIPAAF, 2015). Furthermore, in a product such as pasta that is characterised by a multi-dimensionality of the COO, the respondents' highest agreement concerning the mandatory indication of the country of wheat cultivation is particularly noteworthy. This result highlights that the consumers are heedful of the origin of the raw material for pasta and processed food in general. A possible reason could be the limited number of ingredients used in making pasta, which are exclusively wheat flour and

water. In such “single-ingredient” processed food as pasta, the COO of the wheat mostly affects the consumers' perceived quality of the final product (Aizaki & Sato, 2020). Finally, most of the respondents (88.6%, statement A5) declare that they are willing to pay a premium price for pasta produced with Italian wheat.

Figure 3 shows the consumers' perception of fairness in the relationships among the players involved in the pasta supply chain (“Fairness in the pasta chain” scale). Most of the respondents consider the behavior of the food industry (51.2% of the sample, statement S4) and retailers (51.0%, statement S5) towards farmers to be unfair. These findings are consistent with those reported in the literature (Busch & Spiller, 2016; Samoggia et al., 2021), which highlight that farmers are perceived by consumers as the side with the lower bargaining power in the food chain and considered to be disadvantaged compared to the other parties involved in the supply chain. However, a third of the respondents are neither in agreement nor in disagreement about fairness in the relationships within the supply chain. Similarly, most of the respondents (41.9%, statement S3) are uncertain regarding the fairness of the price of wheat paid to farmers. However, more than a third of the sample (39.7%) do not seem to agree with this statement, considering it a low price but perhaps without quantifying this price. Concerning the respondents' agreement with extending support to the agricultural sector with public funds, the results demonstrate that 67.3% of the respondents agree with using public funds to subsidize the cereal sector (statement S1) and 70.6% the general agricultural sector (statement S2). This evidence is in line with the findings of Ellison et al. (2010a) and Ellison et al. (2010b) who found that the majority of people in the United States are in favor of the US government subsidizing farmers.

4.2 | Results of the PCA

A PCA on the eight statements of the “Italian wheat expectations” scale was implemented. The results obtained from KMO and BTS allow us to confirm the appropriateness of employing a PCA model. We measured a KMO value acceptably high (0.87), and BTS was statistically significant ($\chi^2(28) = 2749.22$, $p = 0.000$). The PCA detected two components associated with an eigenvalue higher than 1, explaining 72.9% of the variance. The rotated loadings are displayed in Table 4.

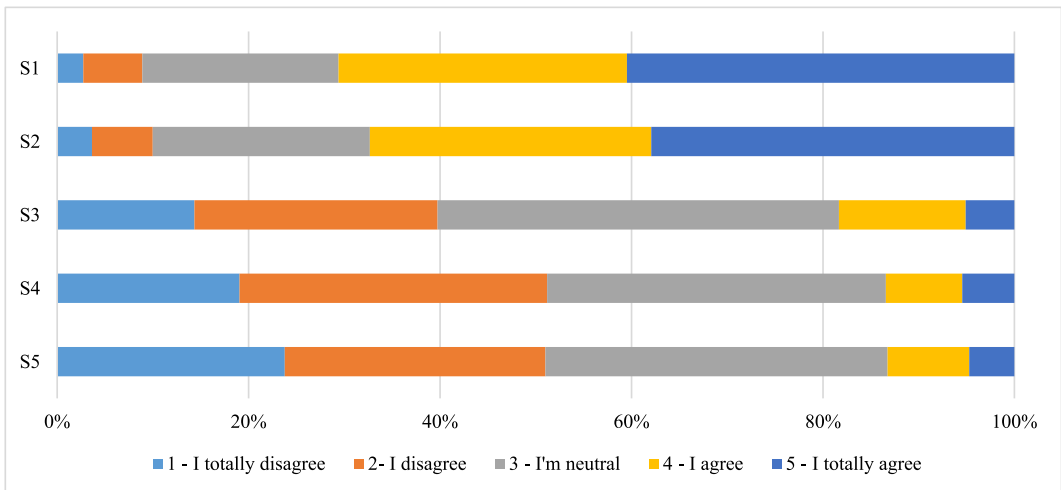


FIGURE 3 Responses to the “Fairness in the pasta chain” scale. S1: I think it is right to provide public subsidies to durum wheat Italian farmers; S2: I think it is important that the Italian agriculture sector continues to be funded with public subsidies; S3: As far as I know, the price Italian farmers get for their durum wheat is a fair price; S4: I think that the food industry treats farmers fairly; S5: I think that food retailers (supermarkets, hypermarkets, discounts) treat farmers fairly.

TABLE 4 Component loadings resulting from the PCA on the statements of the “Italian wheat expectations” construct.

Items	Component 1	Component 2
Pasta made with Italian wheat is tastier	0.385	0.017
Pasta made with Italian wheat is healthier	0.456	-0.070
Pasta made with Italian wheat is of higher quality	0.423	0.014
Pasta made with Italian wheat helps to keep traditional production methods	0.349	0.121
Pasta made with Italian wheat is more natural (less pesticides and herbicides are used in wheat farms)	0.439	-0.051
Pasta made with Italian wheat ensures less environmental impact	0.387	0.012
Pasta made with Italian wheat sustains the Italian agricultural sector	-0.024	0.720
Pasta made with Italian wheat sustains Italian farmers	0.018	0.677

Abbreviation: PCA, Principal Component Analysis.

Component 1 has six items with loadings and Component 2 has two. Component 1 is defined by items related to the aspects ascribed to pasta made with Italian wheat (quality, healthy, taste, naturalness) but not directly explicated by the origin of the wheat. Moreover, the items concerning the lower environmental impact and the preservation of a tradition related to pasta made with Italian wheat have the largest loadings on this component. Component 1 seems to capture the halo effect occurring when consumers use Italian origin as an element to evaluate other characteristics of the pasta. As observed in previous studies, consumers use COO to infer evaluations of the quality and other product features of food (Berry et al., 2015; Holdershaw & Konopka, 2018; Lim et al., 2014). The two items that load to Component 2 are related to the support extended to Italian farmers and the agricultural sector in general by producing pasta with Italian wheat. According to previous studies, consumers can also use COO to express their economic support for a specific country or region and a specific sector involved in the food production process, including agriculture (Awada & Yiannaka, 2012; Chambers et al., 2007). In other words, the first component measures the extent to which the consumer believes that Italian wheat is required for getting a final product of higher quality, while the second component focuses on the importance of consuming pasta made with Italian wheat to support the Italian agricultural economy.

4.3 | Results of the choice models

Table 5 presents the results of: Model 1, which accounts for the main effects exclusively in the preference space; Model 2, which estimates the coefficients in the WTP space; and Model 3, which includes the interactions between the Italian wheat attribute and the two-component scores extracted by the PCA.

In our experimental setting, since we included the brands only to replicate a real purchasing scenario, we opted to rename the three national brands as Brand 1, Brand 2, and Brand 3. For the three models, all the attribute parameters are positive and statistically significant, indicating that all of these parameters positively influence the choice of pasta. Moreover, the error components are always statistically significant, demonstrating a correlation across utilities of the four buying options.

Ultimately, our results evidence that COO is a determinant of the choice of pasta. On average, consumers prefer pasta made with Italian wheat as opposed to that made with wheat cultivated in the EU and other non-EU countries. According to Model 2, the WTP of a package of pasta made with Italian wheat is equal to 2.08 euros. This

TABLE 5 RPL-EC model estimates in preference space (Model 1), in WTP space (Model 2), and in WTP space with interactions (Model 3).

Attributes	Model 1		Model 2		Model 3	
	Estimate	SD	Estimate	SD	Estimate	SD
Brand 1	3.65***	3.16***	2.75***	2.37***	2.31***	2.37***
	-0.26	-0.13	-0.16	-0.14	-0.14	-0.14
Brand 2	3.06***	0.27***	1.82***	0.25**	1.41***	0.24***
	-0.24	-0.09	-0.15	-0.09	-0.13	-0.09
Brand 3	2.37***	2.11***	1.38***	1.88***	0.97***	1.85***
	-0.25	-0.09	-1.15	-0.12	-0.13	-0.11
Private Label	1.95***	3.02***	0.74***	2.88***	0.43***	2.78***
	-0.27	-0.14	-0.16	-0.19	-0.14	-0.18
Pasta made with Italian wheat	2.43***	2.41***	2.08***	2.25***	1.95***	2.18***
	-0.09	-0.10	-0.12	-0.13	-0.11	-0.13
Slow dried	0.39***	0.49***	0.32***	0.60***	0.34***	0.55***
	-0.06	-0.09	-0.05	-0.06	-0.05	-0.07
Price	-1.16***	1.16***				
	-0.05	-0.05				
Error Component	4.43***		3.69***		4.21***	
	-0.22		-0.24		-0.28	
<i>Interactions</i>						
Brand 1 * Comp. 1					0.24***	
					-0.05	
Brand 1 * Comp. 2					0.63***	
					-0.09	
Brand 2 * Comp. 1					0.19***	
					-0.05	
Brand 2 * Comp. 2					0.45***	
					-0.09	
Brand 3 * Comp. 1					0.12**	
					-0.05	
Brand 3 * Comp. 2					0.63***	
					-0.10	
Private Label * Comp. 1					0.13**	
					-0.05	
Private Label * Comp. 2					0.17	
					-0.09	

(Continues)

TABLE 5 (Continued)

Attributes	Model 1		Model 2		Model 3	
	Estimate	SD	Estimate	SD	Estimate	SD
Pasta made with Italian wheat * Comp. 1					-0.07	
					-0.04	
Pasta made with Italian wheat * Comp. 2					0.35***	
					-0.06	
Slow dried * Comp. 1					-0.02	
					-0.03	
Slow dried * Comp. 2					-0.02	
					-0.04	
<i>Summary statistics</i>						
Log-likelihood	-4315.80		-4230.80		-4218.50	
No. observations	4408		4408		4408	
BIC	8749.01		8587.42		8663.58	
AIC	8659.53		8491.56		8491.02	

Note: Standard errors are in parentheses. *** and ** indicate significance at 1% and 5% level, respectively.

Abbreviations: AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion; Comp, component; SD, standard deviation.

result is consistent with the findings of Menapace and Raffaelli (2020) who estimated a WTP of 1.52 euro for the Italian wheat attribute in a similar experiment on pasta.

The coefficients of the four pasta brands are always statistically significant with a positive sign. *Ceteris paribus*, the consumers' utility increases when they opt for one of the alternatives rather than nothing at all. On average, consumers have a strong preference for pasta brands as detected by the magnitude of the parameters linked to the alternatives. The national brands (respectively, Brand 1 in Model 2 and Brand 1 and Brand 2 in Model 1) comprise the attribute most responsible for increasing consumers' utility. Additionally, Brand 3 and PL display a positive coefficient but with a smaller effect compared to the other brands as well as the attribute related to the Italian origin of the wheat. The fact that specific brands correspond to the consumers' higher utility highlights the relevant role of this attribute in the pasta market and the relevance of including the brand as one of the attributes in the experiment. Pasta is a high-concentrated market where the total market share of the three national brands and the PL accounts for around two-thirds of the total sales value. In line with previous studies (Cavallo et al., 2014; Contò et al., 2016), our results demonstrate that brand is the attribute that most influences the consumers' act of purchasing pasta, even more than the Italian origin of the wheat. Consistent with previous studies (Balcombe et al., 2016; Lusk et al., 2006; Newman et al., 2014), the COO labeling had a lesser impact when the experiment included other cue attributes such as the brand. Therefore, the brand acts as a moderator of the effect of the COO, as evidenced by Thøgersen et al. (2017). However, this role of the COO-moderator assumed by the brand depends on the type of brand itself and its features.

Finally, the coefficient of the "slow-dried" attribute is positive and significant; however, it has the smallest effect compared to the other attributes included in the experiment. In alignment with our expectations, in Model 1, the negative and statistically significant coefficient of the price parameter indicates that consumer utility increases when the price decreases.

Compared to the other two models, Model 3 shows similar results in terms of signs, magnitude, and statistical significance of the parameters. As in Model 2, on average, the respondents have a strong preference for pasta brands, followed by the presence of Italian-origin wheat.

The coefficient of the interaction term between the halo component and Italian origin is not statistically significant, instead the coefficient of the interaction term with Component 2 is statistically significant with a positive sign. This suggests that extending support to agriculture is a reason that increases the WTP for consuming pasta made with Italian wheat. In contrast, consumers with a higher score of the halo effect have the brands as main choice drivers. Indeed, the coefficients of the interaction term between Component 1 and the brands are all positive and statistically significant. Moreover, the coefficients of the interaction terms between Component 2 and the brands are all positive and statistically significant except for the PL. The interactions between each of the two components and the “slow dried” attribute are not statistically significant. The standard deviations of the coefficients of all the attributes are statistically significant at the 0.01 level, indicating heterogeneity in the consumers' preference for them. However, the magnitude of the standard deviation compared to the coefficients of the main effect seems to indicate moderate heterogeneity.

5 | CONCLUSIONS AND POLICY IMPLICATIONS

This study contributes to the debate that followed the introduction of the mandatory COO labeling for wheat in the Italian pasta market by providing empirical evidence of the effect of this policy on consumption. Our results reveal that individuals exhibit great support in favor of the Italian regulation on mandatory COO labeling for wheat in the pasta industry. Consumers are interested in product origin and agree with the mandatory indication of the COO.

These findings reveal that this recent regulation is a political success and that it enables the Italian regulator to largely satisfy the high demand for transparency in terms of the production origin of food, further supporting the arguments posited by consumer organizations in the debate surrounding the effect of this regulation.

Moreover, the study's findings indicate that the place of wheat origin indicated on the package is one of the main determinants when it comes to choosing pasta. Using the discrete CE, we demonstrated that consumers are willing to pay a premium price for pasta made with Italian wheat, and this result is consistent and concrete since it was confirmed using different model specifications. The consumers' need for mandatory COO labeling does not seem to stem mainly from the fact that they perceived the pasta made with Italian wheat as tastier, healthier, and more environmentally sustainable. Instead, the results highlight the strong support that consumers seem to extend to farmers and agriculture as explained by the extra price they are willing to pay to consume pasta made with wheat cultivated in Italy. In other words, conscious consumers exhibit a greater WTP than those using the halo effect as heuristic processing. In general, the survey's findings conclude that Italian consumers demonstrate a great awareness regarding fairness in the relationships between wheat producers, retailers, and processors as they believe that farmers are disadvantaged within this system. At the same time, our results show that to counter the unfair treatment of the farmers in the chain, respondents are willing to support them even with public funds. This finding provides interesting evidence for policymakers as it demonstrates that citizens extend a high degree of support towards policies that aim to foster agriculture and rural communities.

The combination of the mandatory COO labeling and the consumers' WTP may rebalance the bargaining power in favor of Italian farmers. They can now pursue product differentiation as they produce goods with unique characteristics, unlike international producers. However, as evidenced by Lusk et al. (2006), the mandatory COO labeling policy requires the implementation of further additional policies to realize an increase in the bargaining power of farmers, and to this end, more direct and efficient solutions must be devised.

The consumers' high WTP for pasta made with Italian wheat can partly assure pasta producers regarding one of the most debated aspects of this mandatory policy, namely the eventual extra production costs resulting from it. Our findings demonstrate that these costs can be, at least partially, incorporated into the price of the final goods;

thus, the adverse impacts prospected by pasta producers could be contained. Nevertheless, we should consider that pasta is widely consumed by Italian families; therefore, increasing the average price can result in an unequal burden of consequences between the richest and the poorest share of the population. Indeed, pasta is a cheap and gratifying source of calories for many low-income households; thus, even a small increase in its price can affect the welfare of such members of the population.

The comparison of different quality attributes of pasta is a relevant contribution of this study. It provides the opportunity to simultaneously investigate how consumers evaluate the relative importance of different attributes. Our experiment somewhat replicated the high-concentrated market structure of pasta. Indeed, our findings highlighted the extreme significance of brands in the pasta market, which represented the attribute most preferred by consumers. This can be translated into useful insights for marketers and pasta makers. If consumers' preference is mainly driven by the brands, the negative effect of producing pasta without Italian wheat would be weaker for the premium brands. By developing adequate branding strategies, such as advertising, pasta makers can signal the quality of their products to consumers and consolidate their market shares. Therefore, producers are not wholly dependent on Italian wheat, and they can also continue to produce their products using imported raw materials.

The findings of this study are context-dependent and may not be immediately generalized to all product categories or purchase situations. Furthermore, a caveat in our findings is that we cannot evaluate if the extra price can compensate for the costs associated with the implementation of this policy, such as higher production costs in terms of the traceability and cost of raw materials. Future studies can be designed and conducted to evaluate the relative costs of adding such information to provide a detailed cost-benefit analysis. A further limitation of this research is that the analyses do not evaluate the impact of sociodemographics or psychological dimensions and personal traits (such as patriotism or ethnocentrism), which could influence the impact of COO labeling. The impact of COO on consumers' purchase intentions for food may be driven by their preference for ingredients of domestic origin as opposed to imported ingredients. An analysis comparing the impacts of COO labeling for food produced in different countries would also be an important avenue for future investigations, and an example of that is measuring individual ethnocentric tendencies using psychometric scales. The sample strategy used is limited by self-selection bias, as it likely weighs towards users with internet access and users engaged with the topic on social media. Therefore, the survey may not be representative of the Italian pasta consumers' population. From a methodological perspective, the hypothetical nature of our experiment and the social desirability bias can partially affect our results. Although a WTP of almost 2 euros for a pack of penne rigate is a noticeable premium price, we must consider that this value could have been overestimated by the respondents despite including the cheap talk script. Further studies eliciting consumers' preferences in a real scenario where the purchase really takes place are required to confirm our findings.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

The research involved human participants. Informed consent was obtained and collected from all subjects involved in the study.

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APPENDIX A: CHEAP TALK SCRIPT

We ask you to indicate your preferences exactly as you would if you were in a real grocery store and were going to face the consequences of your choice, namely that you would have to pay for the selected product. Therefore, answer as if you had actually bought the product because recent studies have shown that there are noticeable differences between the choice of a product in a hypothetical situation (surveys similar to this one) and in the real market. (Translated from Italian)

APPENDIX B: STATEMENTS AND SCALES

“Italian wheat expectations” scale

- P1: Pasta made with Italian wheat is tastier.
- P2: Pasta made with Italian wheat is healthier.
- P3: Pasta made with Italian wheat is of higher quality.
- P4: Pasta made with Italian wheat helps to keep traditional production methods.
- P5: Pasta made with Italian wheat is more natural (less pesticides and herbicides are used in wheat farms).
- P6: Pasta made with Italian wheat ensures less environmental impact.
- P7: Pasta made with Italian wheat sustains the Italian agricultural sector.
- P8: Pasta made with Italian wheat sustains Italian farmers.

“Fairness in the pasta chain” scale

- S1: I think it is right to provide public subsidies to durum wheat Italian farmers.
- S2: I think it is important that the Italian agriculture sector continues to be funded with public subsidies.
- S3: As far as I know, the price Italian farmers get for their durum wheat is a fair price.
- S4: I think that the food industry treats farmers fairly.
- S5: I think that food retailers (supermarkets, hypermarkets, discounts) treat farmers fairly.

“Interest in the Country of Origin” scale

- A1: I think it is right that it is mandatory to indicate the country of origin of the wheat on the label.
- A2: I think it is right that it is mandatory to indicate the country of production of pasta on the label.
- A3: I think it is right that it is mandatory to indicate the country of milling of the wheat on the label.
- A4: I am interested in product origins.
- A5: I am willing to pay a higher price for a package of pasta produced only with Italian wheat.
- A6: I believe that the label indicating the country where durum wheat is grown helps to dissuade the purchase of pasta produced with non-Italian durum wheat.
- A7: I believe that the label indicating the country where durum wheat is grown helps to dissuade pasta producers from purchasing wheat from other countries.

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