

Consumers' Valuation for European food quality labels: Does Label Information Provision Matter?

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Food Labels: A Background

The increasing demand for food quality has led to increased interest in food labeling.

Food labels serve as product differentiation tool since they can inform consumers about the presence of specific attributes in food products.

Among the various types of food labels, 'geographical indication' and 'organic farming' labels have recently received extensive attention from policy makers, firms, and consumers.

Food Labels: A Background

‘Geographical origin’ labels signal the presence of a strong link between the area of production and the quality attributes of a food product.

Organic labels signal food products that are lower in pesticide residues and hence, can be more environmentally friendly, safer, and healthier.

Food Labels: European Context

The European Union has introduced:

- Two geographical indications labels – Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI).
- The Organic Farming label (EC Regulation 510/06; EC Regulation 834/2007).

Definition of PDO Label



According to the Council Regulation (EC) No 510/2006 of 20 March 2006, a *PDO* label covers agricultural products and foodstuffs which are produced, processed and prepared in a defined geographical area – region, a specific place or, in exceptional cases, a country - whose quality or characteristics are essentially or exclusively due to a particular geographical environment with its inherent natural and human factors.

Example of European Products with PDOs



Definition of PGI Label



According to the Council Regulation (EC) No. 510/2006 of 20 March 2006, a PGI label covers agricultural products and foodstuffs closely linked to a defined geographical area. At least one of the stages of production, processing or preparation takes place in the area. These products possess a specific quality, reputation or other characteristics attributable to the geographical origin.

Example of European Products with PGIs

ABENSBERGER
QUALITÄT
Spargel



Abensberger Spargel



THE
LINCOLNSHIRE
SAUSAGE



Definition of Organic Farming Label



Old logo



New logo

According to the Council Regulation (EC) No. 834/2007 of 28 June 2007, the Organic Farming label identifies agricultural products which are obtained from an overall system of farm management and food production that combines environmental practices in line with the respect of nature's systems and cycles, a high level of biodiversity, the preservation of natural resources, the application of high animal welfare standards and a production method which uses natural substances and processes excluding the use of genetically modified organisms (GMO) and chemicals. Besides, this label covers foodstuffs which contain 95% of ingredients of organic agricultural origin.

Definition of Extra Virgin Olive Oil Quality Cue

According to the Council Regulation (EC) No. 1513/2001 of 23 July 2001, an extra virgin olive oil is a superior-category of olive oil obtained from the fruit of the olive tree solely by mechanical or other physical means under conditions that do not lead to alterations in the oil, which have not undergone any treatment other than washing, decantation, centrifugation or filtration, to the exclusion of oils obtained using solvents or using adjuvants having a chemical or biochemical action, or by re-esterification process and any mixture with oils of other kinds. Virgin olive oil having a maximum free acidity, in terms of oleic acid, of 8 g per 100 g.

Definition of Virgin Olive Oil Quality Cue

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Food Labels: Implications

Consumers:

- Reduce the presence of asymmetric information;
- Reduce the risk of quality uncertainty and search cost.

Producers:

- Imitator and non-original producers are kept away from the market;
- Producers get a reputation premium and higher income from the food product with high quality;

Society:

- Support local economy, rural development, and economic cohesion.

Food Labels: Previous Studies

Several studies have shown that consumers' preferences are affected by the presence of these labels and that consumers are willing to pay a price premium for products displaying such labels.

However, there is some evidence suggesting that consumers can get confused and may not entirely know how to interpret these European food quality labels (Giraud, 2002; Aprile et al., 2009).

Objectives

- I. Test for differences in consumers' WTPs for PDO, PGI, organic farming labels and extra virgin quality cue across informed and uninformed consumers.

- II. Test for information effects on consumers' WTPs for PDO, PGI, organic farming labels and extra virgin quality cue across knowledgeable and unknowledgeable consumers.

Experimental Procedures: First Objective

We carried out two different choice experiment (CE) surveys:

- **CE with information:** in which information about the meaning of PDO, PGI, and ORG labels (as well as the extra virgin olive oil (EXTRA) quality cue) was provided to respondents before the CE questions.
- **CE without information:** in which no information on the meaning of the labels was provided to respondents.

Experimental Procedures: First Objective

- Use of choice experiment;
- Used olive oil as product of interest.
- The experimental design included the following attribute and attributes levels.

Attributes	Levels
Price	3.50, 5.50, 7.50 , and 9.50 Euros per a liter of olive oil
GIs	PDO/PGI/absent
Organic Farming	Present/absent
Type of olive oil	Virgin/ extra-virgin

EXAMPLE OF CE QUESTION

Choice set card 1

Attributes	Option A	Option B	Option "None"
Type of olive oil GIs	Virgin 	Extra virgin 	None
Organic farming			Of
Price	\$7.50 <input data-bbox="658 1058 774 1125" type="checkbox"/>	\$3.50 <input data-bbox="1093 1058 1209 1125" type="checkbox"/>	Them <input data-bbox="1537 1058 1653 1125" type="checkbox"/>

Please indicate which option you would choose (Mark your choice)

Experimental Procedures: Second Objective

To achieve the second objective of our study (e.g. information effects across knowledgeable and unknowledgeable consumers), we include in our questionnaires a set of questions aimed at capturing the level of consumer knowledge about the labels we used in our experimental design.

In particular, we asked survey respondents to correctly associate three of the certified characteristics with PDO, PGI, and ORG labels as well as for EXTRA quality cue.

Question example

Could you please indicate which do you think are the three characteristics from among the list below are needed to get a PDO label?

<i>Production from a given production area</i>	X
<i>Origin of ingredients from a given geographical area</i>	X
<i>Traditional production method</i>	X
Taste	
Compliance with hygiene rules	
Quality	
Specific site of at least one stage of the productive process	
Animal welfare	
Origin of at least one ingredient	
Quality of life in rural areas	
Marketing	
Others	-

Experimental Procedures: Second Objective

Then, in each CE surveys we segmented the sample into two consumer groups:

- *knowledgeable* consumer group - includes people who correctly associated three (high knowledge level) and two (medium knowledge level) certified characteristics of all labels and quality cue simultaneously,
- *unknowledgeable* consumer group - includes those respondents who identified only one certified characteristic of the labels and quality cue (low knowledge level) and those who did not match any corresponding certified characteristic associated with all labels and quality cue (no knowledge).

DATA: Samples

- A total of 230 respondents completed face-to-face surveys with and without information respectively.
- The majority of them were female (with info=64.8% - without info=60%), well educated (with info=50% - without info= 44.3%), with an age between 30-44 years old (with info=48.9% - without info= 45.2%).
- A comparison of the socio demographic distributions of the two CE samples suggest that the samples of “CE with info” and “CE without info” are similar across the socio-demographic characteristics.

Data: knowledgeable and unknowledgeable consumers

- The percentages of knowledgeable consumers across all labels and quality cue are 31.74% and 39.57% in the CE surveys with and without information, respectively,
- while the percentages of unknowledgeable consumers across all labels and quality cue were 39.13% and 42.60% in the CE surveys with and without information, respectively.

Econometric Analysis

- We estimated an Error component logit model (EC) across informed and informed consumers as well as knowledgeable and unknowledgeable consumer groups.
- Utility function:

$$U_{ijt} = \beta_0 * SQ + \beta_1 * PRICE_{ijt} + \beta_2 * PDO_{ijt} + \beta_3 * PGI_{ijt} + \beta_4 * ORG_{ijt} + \beta_5 * EXTRA_{ijt} + \eta_{ij} + \varepsilon_{ijt}$$

Econometric Analysis

- Using the estimates of the EC model, for each consumer group we then estimated WTP values for each label using the bootstrapping method (Krinsky and Robb, 1986), from which we obtained a distribution of 1000 WTP values for each label.
- Finally, we tested differences in WTPs across the two CE surveys (e.g. with and without information) using a non-parametric Test (Poe et al 2005). (p-values indicate the level of significance)

Results: WTP across CE with and without information

Label/ cue	WTPwithout_info	WTPwith_info	p-value
PDO	4.00 (1.13) [0.504988 – 7.7773] ³	5.66 (0.77) [3.40214 - 8.36704]	0.113
PGI	3.66 (0.92) [0.666284 – 7.01446]	1.14 (0.60) [-1.00168 - 2.98332]	0.011
ORG	4.39 (0.76) [2.28542 – 6.82988]	3.52 (0.50) [2.17232 – 5.15364]	0.829
EXTRA	6.01 (0.93) [3.60238 – 9.14332]	4.22 (0.50) [2.62436 – 5.72766]	0.041

Only the differences in WTPs between PGI and EXTRA olive oil labels are statistically significant across the CE surveys; while no statistically significant differences were found in consumers' WTP for ORG and PDO labels across the CE surveys.

Implications

Consumer's confidence on the PGI label is lower than that for the PDO label.

When consumers are informed about the meaning of the labels, the PDO label is perceived to be a proxy for organoleptic properties, thereby reducing the value attached to EXTRA and ORG labels.



consumers' valuation for European quality labels is directly linked to the level of knowledge about the meaning of these labels

Results: WTPs between Knowledgeable and unknowledgeable

Knowledgeable and unknowledgeable between CE surveys				
	<u>PDO</u>	<u>PGI</u>	<u>ORG</u>	<u>EXTRA</u>
Knowledgeable				
WTP _{without_info}	9.68 (2.96)	2.18 (1.48)	4.04 (1.27)	6.10 (2.05)
WTP _{with_info}	8.31 (1.70)	0.55 (1.18)	4.13 (0.92)	5.35 (0.94)
p-value	0.352	0.195	0.469	0.378

When consumers have high knowledge about the meaning of the labels, their WTP for the labels did not statistically change either in terms of the relative importance ranking or in the magnitudes of the WTP values

Results: WTPs between Knowledgeable and unknowledgeable between surveys

Knowledgeable and unknowledgeable between CE surveys				
	<u>PDO</u>	PGI	<u>ORG</u>	<u>EXTRA</u>
Knowledgeable				
WTP _{without_info}	9.68 (2.96)	2.18 (1.48)	4.04 (1.27)	6.10 (2.05)
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Results: WTPs between Knowledgeable and unknowledgeable between surveys

Knowledgeable and unknowledgeable between CE surveys				
Unknowledgeable				
$WTP_{\text{without_info}}$	1.78 (1.17)	3.81 (1.62)	5.01 (1.33)	6.00 (1.46)
$WTP_{\text{with_info}}$	3.85 (1.34)	2.23 (1.14)	2.70 (0.72)	2.78 (0.81)
p-value	0.121	0.212	0.055	0.019

Unknowledgeable consumers' WTPs for some labels (e.g. ORG and EXTRA) are different across the CE surveys (i.e., without and with information).

Results: WTPs between Knowledgeable and unknowledgeable within surveys

Knowledgeable vs. unknowledgeable within CE surveys				
	<u>PDO</u>	PGI	<u>ORG</u>	<u>EXTRA</u>
WTP <small>without info</small>				
Knowledgeable	9.68 (2.96)	2.18 (1.48)	4.04 (1.27)	6.10 (2.05)
Unknowledgeable	1.78 (1.17)	3.81 (1.62)	5.01 (1.33)	6.00 (1.46)
p-value	0.002	0.228	0.298	0.492

Different valuation of PDO and PGI labels when moving from unknowledgeable to knowledgeable consumers

Results: WTPs between Knowledgeable and unknowledgeable within surveys

Knowledgeable vs. unknowledgeable within CE surveys				
	<u>PDO</u>	PGI	<u>ORG</u>	<u>EXTRA</u>
WTP_{with info}				
Knowledgeable	8.31 (1.70)	0.55 (1.18)	4.13 (0.92)	5.35 (0.94)
Unknowledgeable	3.85 (1.34)	2.23 (1.14)	2.70 (0.72)	2.78 (0.81)
p-value	0.015	0.847	0.105	0.015

Substitution effect between PDO and PGI labels when moving from unknowledgeable to knowledgeable consumers

Main Finding : knowledgeable and unknowledgeable respondents

- The rank order of consumers' WTP for the European quality labels is not different across knowledgeable and unknowledgeable consumers when information is provided to them;
- When information about the meaning of the European quality labels is not provided to consumers, their preferences are less stable and are strongly related to their prior knowledge level of the labels;
- The provision of information did not affect knowledgeable consumers but had an effect on unknowledgeable consumers.

Conclusion

- It seems that the presence of food quality labels has not solved the asymmetric information problems between consumers and producers (Unknowledgeable consumers), resulting to a persistent information gap.
- Therefore, the European Commission should develop strategic initiatives to facilitate information flows between farmers, buyers and consumers.
- New strategic orientations are needed to improve the communication of the certification and labeling programs to consumers.

Thank You for Your Attention

Labels and meaning of PDO and PGI labels



Protected Geographical
Indication (PGI)

**At least one stage of production
in a given geographical area**

and

**Origin of at least one ingredient
from a given geographical area**

and

Traditional production method



Protected Designation
of Origin (PDO)

**Production in a given geographical
area**

and

**Origin of ingredients from a given
geographical area**

and

Traditional production method

Labels and meaning of Organic Farming label

Old logo



New logo



Absence of GMOs

and

Minimum use of fertilizers

and

Respect for the environment and for animal welfare