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Consumer preferences associated with the protected geographical indication label in the marketing of lamb meat

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ABSTRACT

The aim of this work is to analyse the importance consumers attach to the geographical indication (GI) label compared to other key characteristics involved in the marketing of lamb meat. Our findings corroborate the significant association in consumers' minds between the origin of lamb meat and the protected geographical indication (PGI). Nonetheless, it is worth noting that the consumer segments identified in this work attach greater importance to different characteristics of PGI lamb meat, which may be directly related to socioeconomic factors. In this sense, the less ethnocentric consumers, who have a higher income and higher level of education, show a greater preference for the breed of lamb, while the more ethnocentric consumers present a greater preference for brand name. The existing overlap between the preference for the PGI products and other attributes could mean that consumers would perceive similarly a product without PGI but including specific reference to all those attributes. In this regard, the PGI label may be serving to reduce search efforts and times.

1. Introduction

Market studies have shown a general reduction in meat consumption (Grunert, 2006) and a clear trend towards substituting certain types of meat for others (Bernabéu and Tendero, 2005), with an especially competitive scenario for higher-priced and less widely consumed meat types, as is the case of lamb meat (Gracia and De-Magistris, 2013; de Andrade et al., 2016d).

In the specific case of the European Union (EU), lamb meat production fell 17.62 % in the 2007–2017 period (FAO, 2019) due, among other things, to the continuous decrease in price since 2011 (EUROSTAT, 2019). Although, in overall terms, lamb meat represents only a small part of global meat production, in producing countries, it is essential on account of its environmental implications and its capacity to settle population and generate income in rural areas (Ponnampalam et al., 2016). Consequently, differentiation of lamb meat associated with a quality label may be a key factor in ensuring the viability of the sector. Consumers' increasing appraisal of quality (Simpson et al., 1998; Northen, 2000; Bernabéu et al., 2018) opens up new business opportunities for producers able to adapt to these novel circumstances.

A number of studies have analysed the impact of different variables on the formation of preferences among lamb meat consumers, taking into account both the product's intrinsic factors (e.g., colour or percentage of fat) (Bernués et al., 2012; Sañudo et al., 2013; de Andrade et al., 2016d), and extrinsic factors (e.g., origin or production method) (Berta Schnettler et al., 2008; Montossi et al., 2013; Rabadán et al., 2020).

One of the extrinsic factors is that of Geographical Indications (GIs), whose importance in the formation of lamb meat consumers' preferences has been underlined in numerous studies (Sepúlveda et al., 2010; Gracia and De-Magistris, 2013; Bernabéu et al., 2018). The European Commission defines a GI as: "*a distinctive sign used to identify a product as originating in the territory of a particular country, region or locality where its quality, reputation or other characteristic is linked to its geographical origin*" (EC, 2019a). In the production of fresh meat in Europe, the most commonly used seal of GI is the Protected Geographical Indication (PGI). In the EU, 164 fresh meat products have been awarded the PGI seal, of which six correspond to lamb meat produced in Spain (EC, 2019b).

The study of the influence of these GI labels on the formation of preferences of consumers has increased on the last years (Bernabéu et al., 2018; Aboah and Lees, 2020b, a; Dudinskaya et al., 2021). On a

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study developed on four different types of meat, Aboah and Lees (2020b) reported that quality certification was the fourth most important quality cue in lamb and pork meats, while this variable received lower attention (out of top five) in the case of beef and chicken. However, the acceptability of these labels also depends on the country studied. On a recent study by Dudinskaya et al. (2021), authors found that consumers were willing to pay more for red meats with GI labels in Greece, Italy, Turkey and the UK, but not in Finland or France.

PGI certification of a lamb meat product has a number of effects on its characteristics. The area in which the animals are bred and slaughtered is a strictly regulated element of the GI label. The origin of the meat is one of the characteristics to which lamb meat consumers attach greatest importance as it constitutes an easily identifiable mark of quality (Font i Furnols et al., 2011; Gracia and De-Magistris, 2013; Bernabéu et al., 2018). In the study by Caroprese et al. (2020), authors reported that consumers acceptability increased when information about the geographical origin of the lamb meat was provided. The PGIs are also associated with the breed of lamb, a variable which has also been identified as having an impact on lamb consumers' preference formation in Spain, Germany and the UK (Font i Furnols et al., 2006). In this sense, Gracia and De-Magistris (2013) found that Spanish consumers were willing to pay a higher price for locally produced "Ojinegra de Teruel" lamb meat.

Given the importance of the origin of lamb meat in consumers' preference formation (Font i Furnols et al., 2011; Gracia and De-Magistris, 2013; Bernabéu et al., 2018) and the direct relationship between GI and the place of production (EC, 2019a), it would be of interest to determine the commercial possibilities of lamb meat consumers according to their level of ethnocentrism.

Broadly speaking, ethnocentric tendencies are understood to be the positive attitudes that consumers develop towards food produced in the surrounding geographical area (Bernabéu et al., 2013). Ethnocentrism originally referred to consumers' preferences for products produced in their own country rather than those imported, but this concept has recently been extended to include products produced in other regions within the same country (Fernández-Ferrín and Bande-Vilela, 2013). The Consumer Ethnocentric Tendency Scale (CETSCALE) can be used to identify consumers according to their level of ethnocentrism (Shimp and Sharma, 1987; Jiménez-Guerrero et al., 2014). Less ethnocentric consumers are willing to choose products regardless of their place of origin, attaching importance to other characteristics. In contrast, more ethnocentric consumers feel that if they purchase products from other regions or countries, they are acting against their own identity, damaging the local economy and increasing unemployment (Sharma et al., 1995; Durvasula et al., 1997; Bernabéu et al., 2013). Given the implications of lamb meat production for local economies (Ponnampalam et al., 2016) and the importance lamb consumers attach to the origin of the meat (Bernabéu et al., 2018), the CETSCALE is a useful tool to segment consumers according to their level of ethnocentrism.

The aim of this work, then, is to analyse the relative importance consumers attach to the PGI label compared to other key characteristics of lamb meat, and depending on their level of ethnocentrism, to segment consumers and determine their preferences, with the ultimate objective being to develop specific strategies to enhance the expectations of the sector and the associated industry.

2. Methodology

The data used in this study were collected in the Madrid Metropolitan Area (Spain) in 2017 from consumers about to shop in different commercial establishments. The Madrid Metropolitan area was chosen as the study area as it is considered the primary centre of business and commerce in Spain, and is a diverse, cosmopolitan area, which adequately reflects the opinion of the general population of the country. The fifteen-minute questionnaire was conducted by professional interviewers hired for that specific purpose.

A total of 400 lamb meat consumers about to buy food products were surveyed. The maximum sampling error did not surpass 5.0 %, for a confidence level of 95.5 %, coverage factor k = 2, under the principle of maximum indetermination (p = q = 50 %). Before the fieldwork, a preliminary questionnaire was administered to 25 food consumers to confirm that the survey questions were well designed and easily understandable.

The data were analysed using multivariate analysis techniques, determining lamb meat consumers' preferences in order to quantitatively and qualitatively identify their user behaviours. The variables considered in this work were selected drawing on previous national and international studies on lamb meat consumption (Bernués et al., 2003; Font i Furnols et al., 2011; Díaz et al., 2013; Gracia and De-Magistris, 2013; Bernabéu et al., 2018).

The explanatory variables used in this study were origin, trade mark, breed, colour and price, using as objective variable the presence of a PGI label as a mark of quality differentiation All these variables were rated on a 5-point Likert-type scale, whereby lamb meat consumers indicated the level of importance they attach to each of these variables when buying, with 1 being "not at all important" and 5 being "very important.

The data analysis was conducted using logistic regression. This method is of great use to analyse relationships between variables, when the objective variable is dichotomous. In our case, the objective variable was the importance given to the presence of a PGI label on lamb meat, measured in five categories from 1 to 5. To this end, this variable was converted into a dichotomous variable identifying two levels, differentiating between consumers that attached little importance to these quality seals (values below the mean) or great importance (values above the mean), respectively. It was considered that using the sample mean, the two distinct groups associated to the two dichotomous levels of the target variable in the logistic regression were more balanced.

Logistic regression assumes that variable Y is modelled as a binomial distribution, taking the value of 1 with likelihood P and the value of 0 with likelihood 1-P. This regression predicts the likelihood of Y taking the value of 1, conditioned to the values taken by the predictive variables $P(Y = 1 \mid X = x)$; the likelihood, in other words, of a consumer giving a high score to the PGI label, given their scores for the other lamb meat variables. This probability is modelled as follows:

$$p_i = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_{1,i} + \beta_2 x_{2,i} + \ldots + \beta_k x_{k,i})}}$$

To verify the stability of our results, we used linear discriminant analysis (LDA), a method used extensively to classify categorical variables with more than one class. In this sense, it is assumed that $f_k = Pr(X = xY = k)$ is the density of the likelihood of the distribution of explanatory variables X for the group of individuals for whom Y takes the particular value K.

Using Bayes' theorem, it is possible to estimate the likelihood of Y taking each of the values, conditioned to the values of predictors X:

$$p_k = Pr(Y = kX = x) = \frac{\pi_k f_k(x)}{\sum_{i=1}^{K} \pi_i f_i(x)}$$

If the classes are appropriately separated and the f_k densities follow normal distributions (different mean vector for each class but common matrix of variances and covariances), the space of predictors X is divided into regions K, separated by linear borders, which determine which of the likelihoods p_k is greater, and thus, which of classes K of variable Y is the most probable for these given values of X.

In the present work, variable Y is the score for the PGI label, taking five categories as values, from 1 to 5, and variables X are those previously described. The space of predictors X in this model is divided into 5 regions where, for each combination of values awarded to the variables of origin, brand, breed, colour and price, the score from 1 to 5 a consumer will give to the PGI label is predicted.

In addition, the CETSCALE was used to determine the level of ethnocentrism of consumers (Shimp and Sharma, 1987;

Jiménez-Guerrero et al., 2014). The CETSCALE comprises 17 items which consumers are asked to rate on a 7-point Likert-type scale, according to their level of agreement or disagreement with each of the statements. A score of 1 corresponds to "strongly agree" and 7 corresponds to "strongly disagree" (Shimp and Sharma, 1987). The total score awarded by each individual to the scale may vary between 17 and 119, with the lowest scores identifying the least ethnocentric consumers and the highest scores, the most ethnocentric consumers.

We conducted a direct segmentation, taking the mean score on the CETSCALE as a reference in order to divide the segments, as recommended by (Camarena-Gómez and Sanjuán, 2010). Accordingly, the respondents with the lowest scores were identified as the less ethnocentric consumer segment, formed by lamb meat consumers with a more positive attitude towards food produced outside their own region, while those with the highest scores were identified as the more ethnocentric, showing the most negative attitudes towards food produced outside their region of origin (Annex).

Each segment was typified according to socioeconomic characteristics and with relation to the other key characteristics of lamb meat, using the regression analysis previously described, in order to identify them according to their level of ethnocentrism.

The statistical analysis was conducted R version 3.5.2 (2018) and the RStudio environment and its libraries.

3. Results and discussion

The regression analysis used correctly predicts the dichotomous variable in 76.6 % of the cases (Table 1). The consistency of these results is upheld when using LDA, which correctly predicts 49.1 % of the cases for the variable in five levels (Table 2), considerably outperforming the naive Bayes classifier.

The origin of the meat has traditionally been recognised as one of the most significant variables in the formation of lamb meat consumers' preferences (Font i Furnols et al., 2011; Gracia and De-Magistris, 2013). Drawing on the findings of the present study, it can be seen that the origin of the meat is the most important characteristic for consumers of PGI- certified lamb meat ($p < 0.001$). Sepúlveda et al. (2010) previously reported this relationship. There appears to exist a direct relationship between a preference for GI labels and a greater importance attached to the origin of the product, thus demonstrating the success of these quality labels in achieving one of the aims for which they were designed: to identify origin as an element of quality differentiation.

A greater preference for lamb meat with a GI label is also associated with a greater preference for branded meat products and with greater importance given to the breed of lamb. The literature has paid scant attention to the variable of brand, which has only occasionally been reported as significant in specific segments of lamb meat consumers (Bernués et al., 2003).

Breed, in contrast, has been the subject of more extensive research (Font i Furnols et al., 2006; Gracia and De-Magistris, 2013), and is also an element of the GI labels that is regulated and limited by legislation (EC, 2019a). The association found between the greater importance attached to breed and quality labels seems to suggest that consumers are aware of this relationship and use the PGI label as a guarantee of the breed selection, or that they use is as a further guarantee of extrinsic quality beyond that of just the label.

Colour is an important parameter widely used by consumers to establish information about the freshness and useful life of meat (Passetti et al., 2019). Few studies have analysed the influence of this variable on the formation of lamb meat consumers' preferences, despite having been the subject of considerable research on other types of meat, such as pork or beef (Bredahl et al., 1998; Bredahl, 2004). Our results show a clear association between the importance attached to the colour of the meat (intrinsic quality variable) and a greater preference for lamb meat with PGI (extrinsic quality).

A number of studies have reported the limited impact of price on the preference formation of lamb meat consumers, compared to other variables (Font i Furnols et al., 2011; Bernabéu et al., 2018). This finding is typically explained by the fact that lamb itself is relatively expensive and thus generally attracts consumers less concerned about price. Nonetheless, our findings suggest that the negative relationship between a preference for PGI and the importance consumers attach to the price of lamb meat corresponds to standard market behaviour, that is, the higher the price, the less the use.

On a market in which the number of brands is limited, consumers that give importance to specific brands also show stronger preference towards meats with the PGI label. A PGI label can be considered as a collective brand associated to specific quality attributes. Attending to the results, it can be suggested that consumers use the PGI label as a reference to the origin of the product and as guarantee of the use of a specific breed, among other attributes. The existing overlap between the preference for the PGI products and specific attributes, mainly origin and breed, could mean that consumers would perceive similarly a product without PGI, but including specific reference to all those attributes. However, the label indicates a high-quality product, including intrinsic references to a number of attributes, and thus limiting search efforts and time.

Moreover, apart from identifying the associations between the variables in lamb meat consumers, it is necessary to subdivide these consumers in order to develop strategies that are specific and more closely adapted to specific groups of consumers.

Table 3 shows the results obtained when the regression analysis is conducted on the consumers segmented by their level of ethnocentrism.

Table 1
Model of estimated parameters for lamb meat consumers.

Variable	Coefficient estimate		p-value
Intercept	−3.9152	***	2.98e-10
Brand	0.3600	***	0.0002
Breed	0.2826	**	0.0020
Colour	0.3003	**	0.0023
Price	−0.2517	*	0.0320
Origin	0.5283	***	5.94e-09

Results of the logistic regression. Dependent variable: importance given to the PGI label. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 2
LDA coefficients for lamb meat consumers' preferences.

Variables	LD1	LD2	LD3	LD4
Brand	0.33597162	−0.4917023	−0.2891352	0.07117622
Breed	0.25653622	−0.1286690	−0.1175603	−0.31658604
Colour	0.21050305	0.3046606	−0.3067047	0.57140204
Price	−0.09644557	−0.4912142	0.6038327	0.38845095
Origin	0.46673779	0.3091003	0.4397661	−0.13982249

Table 3
Model of estimated parameters for less and more ethnocentric consumers of lamb meat.

Variables	Segment 1. Less ethnocentric (49.9 %)[1]			Segment 2. More ethnocentric (50.1 %)[1]		
	Coefficient estimate		p-value	Coefficient estimate		p-value
Intercept	−3.619	***	9.85e-05	−4.2996	***	9.82e-07
Brand	0.2737		0.0562	0.4346	***	0.0009
Breed	0.3793	**	0.0034	0.1584		0.2415
Colour	0.3038	*	0.0379	0.3303	*	0.0177
Price	−0.3319	*	0.0445	−0.1661		0.3323
Origin	0.4873	***	0.0003	0.5766	***	2.89e-06

[1] Size of segment.
*** $p < 0.001$.
** $p < 0.01$.
* $p < 0.05$.

The percentages of correct prediction are around 73.2 % for the segment of less ethnocentric consumers and 79.9 % for the more ethnocentric consumers. Thus, we have two consumer segments with different preferences when acquiring PGI-certified lamb meat.

The consumer segments defined herein also have diverse socioeconomic characteristics (Table 4), which partly serve to explain the differences in their preferences. It can be seen that the less ethnocentric consumers have a higher level of education and income compared to their more ethnocentric counterparts, who, in turn, are those most adverse to the process of globalisation, especially as regards the perceived loss of jobs that acquiring products from other regions might generate in their region of origin (Sharma et al., 1995; Durvasula et al., 1997; Bernabéu et al., 2013).

The two groups of consumers also show differences in the associations they make between the variables considered regarding the PGI label on lamb meat. Our findings show that a greater preference for lamb meat with a PGI seal is clearly linked to greater importance given to the origin of the product. However, significant differences emerge as regards other variables, such as brand and breed. The less ethnocentric consumer segment attaches greater importance to breed than brand, while the opposite occurs in the more ethnocentric group. Brand is a variable of extrinsic quality that is easier to evaluate than breed, given that the latter requires a greater search for information and the need for greater knowledge of the product. Thus, it might be that the lower educational level of the more ethnocentric segment (Sharma et al., 1995; Marín, 2005; Bernabéu et al., 2013) leads them to pay more attention to brand as a quality variable since it is easier to evaluate compared to other variables of extrinsic quality. Consequently, in the case of the more ethnocentric consumer segment, it would be advisable to develop specific brands, above and beyond seals of geographical origin, to incentivise consumption.

With regard to price, Gracia and De-Magistris (2013) previously reported that consumers who attached least importance to the origin of the meat were those who were most concerned about price. In the present study, price is not an important factor for the more ethnocentric consumers but is so in the case of the less ethnocentric segment.

Table 4
Socio-economic characteristics of consumer segments (%).

Variables	Segment 1. Less ethnocentric (49.9 %)[1]	Segment 2. More ethnocentric (50.1 %)[1]
Gender		
Male	54.04 %	48.02 %
Female	45.96 %	51.98 %
Age (in years)		
18–24	9.60%	9.41 %
25–34	19.19%	21.78 %
35–46	36.36%	32.67 %
50–64	24.75%	23.76 %
>65	10.10%	12.38 %
Education		
Grade School	16.67 %	19.80 %
High School	31.31 %	35.64 %
University	52.02 %	44.55 %
Monthly net family income (€)		
<900	16.67 %	20.30 %
900–1,500	24.24%	31.68 %
1,501–2,100	28.28%	25.25 %
2,101–3,000	21.72%	12.38 %
>3,000	9.09%	10.40 %

[1] Size of segment.

4. Conclusions

The aim of this work was to analyse the relative importance consumers attach to the GI label compared to other key characteristics of lamb meat. Our findings reveal the significant association that consumers make between the PGI label and the origin of lamb meat as a synonym of differentiated quality. Creating this robust association in consumers' minds has been one of the foremost aims of these quality labels since their inception, with their success thus being underlined, at least in the case of lamb.

The consumer preference for meat products of a specific origin should be considered a key element in the study of consumption preferences, as clearly underlined by the expansion of PGI labels for meat products. However, the existence of these labels alone appears not to be sufficient, with it being necessary to develop specific parallel strategies designed to address the preferences associated with these quality seals. The need for such strategies, drawing on the preferences associated with these quality labels, has been further underscored by the segmentation of lamb meat consumers according to their level of ethnocentrism.

In this sense, recommendations to producers and the associated industry could be divided into two different strategies, specifically designed for each of the two segments. On the one hand, it would be recommendable to emphasise the possibility of developing brand names, a rarely used concept in the marketing of lamb meat, as a business opportunity to orient the product towards more ethnocentric consumers with a lower level of education and purchasing power. Developing such brands as a fast, easy way to identify the product, necessarily linked to a PGI label, might enhance the acquisition of lamb meat among this consumer segment.

Furthermore, there clearly exists a consumer segment with higher income and level of education, who also clearly prefer PGI-certified lamb meat. Such consumers show no preference for branded lamb meat, but do attach importance to the breed of lamb. Hence, to attract these consumers, it would be recommendable to enhance the information on product labels regarding the characteristics of the breed and the conditions under which they are bred.

Authors declaration

The authors wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

The authors confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

The authors confirm that they have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

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Appendix A. Average values from the CETSCALE items

Items	Total Sample	Seg. 1. Less ethnocentric (49.9 %)[1]	Seg. 2. More ethnocentric (50.1 %)[1]
1. Spanish consumers should always buy Spanish-made products instead of imports	3.56	2.36	4.76
2. Only those products that are not available in Spain should be imported	3.77	2.82	4.72
3. Buying products from Spain means saving jobs in our country	4.33	3.18	5.48
4. Spanish products should be considered as the first, last, and foremost	3.25	1.96	4.53
5. Purchasing products made outside the country is anti-Spanish	1.78	1.13	2.42
6. It is not good to purchase foreign products, because it puts Spanish out of jobs	2.27	1.25	3.28
7. A true Spanish consumer should always buy products made in Spain	2.11	1.04	3.17
8. We should purchase products made in Spain instead of allowing other countries get rich off us	2.19	1.09	3.29
9. It is always best to purchase Spanish products	2.47	1.30	3.64
10. There should be very little trading or purchasing of goods from other countries unless out of necessity	2.22	1.27	3.17
11. Spanish should not purchase foreign products, because this hurts Spanish business and causes unemployment	2.27	1.24	3.29
12. All imports should be curbed	1.96	1.12	2.79
13. It may cost me more in the long run but I prefer to support Spanish products	3.04	1.73	4.35
14. Foreigners should not be allowed to put their products on our markets	1.94	1.18	2.70
15. Foreign products should be taxed heavily to reduce their entry into Spain	2.24	1.41	3.07
16. We should only purchase from foreign countries those products that we cannot obtain within our own country	2.90	1.67	4.13
16. Spanish consumers who purchase products made in other countries are responsible for putting their fellow Spanish out of work	1.85	1.08	2.62
TOTAL	44.12	26.83	61.41

[1]Size of the segment.

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