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Factors associated with the purchase of designation of origin lamb meat

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Abstract

As in other products, quality labels that designate the origin of lamb meat are increasingly used by consumers as a cue for inferring the quality of the meat. The aim of the present paper is to identify those factors that most affect the purchase of lamb with an origin quality label. For this purpose a total of 371 questionnaires were carried out in the region of Aragón located in the north east of Spain. This region produces 48.5% of the total amount of lamb meat with a Spanish protected geographical indication, whilst it also has the country's greatest per capita consumption (6.8 kg/person/year). To identify the most determining factors a logistic regression analysis was performed between three groups of buyers, characterised by their degree of loyalty towards purchasing origin quality labelled lamb. The results show that those buyers who are less loyal to the label pay less attention to the origin of the meat when forming quality expectations at the time of purchase, whilst these are the buyers that place greatest importance on animal feeding as an aspect affecting the final quality of lamb meat. The buyers that are very loyal to the quality label associate this label with a product that offers greater guarantees and is healthier. Lamb meat buyers with medium loyalty to quality labels, consider quality-labelled lamb meat has better intrinsic attributes.

Keywords: quality label; quality perceptions; protected geographical indication.

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25 1. Introduction

26 An accepted view on perceived quality is that quality perceptions before purchasing are based
 27 on quality cues and that these are, in turn, linked to quality attributes (Oude Ophuis & Van
 28 Trijp, 1995). Oude Ophuis and Van Trijp (1995) and Steenkamp and Van Trijp (1996) argue
 29 that quality cues can be corroborated by the senses before purchasing, whilst quality attributes
 30 are aspects of the product that generate benefits (both functional and psychological) and
 31 cannot be observed before consuming it. There are two types of quality cues: intrinsic and
 32 extrinsic (Becker, 2000; Grunert, Harmsen, Larsen, Sorensen & Bisp, 1997; Northen, 2000).
 33 Whilst the former are related to the physical product, for example, colour or fat content of the
 34 meat, the latter are related to the product but are not physically part of it and are cues such as
 35 price or packaging (Oude Ophuis & Van Trijp, 1995; Steenkamp & Van Trijp, 1996).
 36 Furthermore, from the point of view of information economy, three quality attributes have
 37 been identified: search, experience and credence quality (Becker, 2000; Grunert et al., 1997;
 38 Northen, 2000).

39
 40 Whilst the intrinsic quality cues may only be used to predict experience attributes such as
 41 taste and tenderness, extrinsic cues can also communicate credence attributes (Becker, 2000;
 42 Northen, 2000). Thus, credence attributes relating to the place of production or origin, which
 43 is highly valued by consumers (Maza & Ramírez, 2006; Sánchez, Sanjuán & Akl, 2001;
 44 Sepúlveda, Maza & Mantecón, 2008), can only be successfully predicted through the use of
 45 extrinsic cues such as, for example, labelling (Northen, 2000; Oude Ophuis & Van Trijp,
 46 1995).

47
 48 Product labelling has become an increasingly important means of sending messages about
 49 food quality and safety to consumers (Gellynck, Verbeke & Vermeire, 2006). Hence the label

is considered to be a cue for inferring the quality of meat (Martinez, Hanagriff, Lau & Harris, 2007; Verbeke & Viaene, 1999) particularly when credence attributes are sought as it helps to convert credence attributes into extrinsic quality cues (Becker, 2000; Bernués, Olaizola, & Corcoran, 2003). In this case, the more clearly identifiable quality indicators such as origin quality labels are included, the greater the interest of consumers towards using them as quality cues is (Verbeke & Viaene, 1999). With regards to quality labels that seek to link fresh meat with the production region or origin, Europe stands out for its use of Protected Geographical Indications or PGIs.

In the lamb meat sector Spain has five Protected Geographical Indications -PGIs. The “Ternasco de Aragón” PGI accounts for the greatest share (48.5%) of PGI lamb meat production. Aragón, in the north east of Spain where this research was carried out, has the greatest per capita consumption of lamb (6.8 kg of meat/person/year), which is well above the Spanish average of 2.7 kg of meat/person/year (MARM, 2009). Research into factors associated with the purchase of origin quality-labelled lamb meat, has been more limited than that carried out into beef. The aim of this study was to identify those factors that most affect and motivate the purchase of origin quality labelled lamb meat.

2. Methodology

The information used in this study was obtained from personal interviews based on questionnaires, aimed at a sample of 371 buyers of lamb meat residing in the city of Zaragoza (Spain). This city was selected since 50.5% of the population of Aragón is concentrated in Zaragoza (IAEST, 2007) whilst, at the same time, it has the highest percentage of quality-labelled lamb meat consumption in Aragón. It is also important to take into account that products with a quality label that designates an origin, as is the case of the “Ternasco de

75 Aragón” PGI, have an effect that is limited to consumers who live in the same region of
76 origin as the products (Van der Lans, Van Ittersum, De Cicco & Loseby, 2001). To ensure
77 representativeness in terms of age, the sampling, which was carried out from July to
78 November 2008, was stratified with proportionate allocation by age ranges. Age was selected
79 as it is one of the socio-demographic variables that has been identified (Wachenheim et al.,
80 2000; Martínez et al., 2007) as having the greatest influence on quality-labelled meat
81 consumption. Unlike age and level of income, other socio-demographic aspects such as
82 gender and level of education, have been identified as aspects that are not associated with
83 quality-labelled meat consumption (Angulo, Gil & Tamburo, 2005; Gracia, 2005; Sepúlveda
84 et al, 2008; Wachenheim et al., 2000). For a confidence interval in results of 95.5% ($Z=2$) and
85 assigning intermediate p and q values ($p=0.5$ and $q=0.5$) an overall sample error of 5.2% was
86 obtained, which is considered acceptable.

87
88 The closed-type questionnaire contained various questions with different measurement scales
89 for responses. Apart from the typical questions regarding buying habits and personal
90 information, the questionnaire included questions related to quality aspects, attitudes towards
91 purchasing lamb meat and the lifestyle of respondents. To evaluate the level of importance
92 that consumers place on a series of aspects of production and on a set of search and credence
93 quality attributes of lamb meat that may affect purchase, two ranking scales were used, one
94 for production aspects and another for quality attributes. In each case, 7 items could be
95 classed in order of preference, from the most important to least important¹. To measure the
96 attitudes of respondents towards quality-labelled lamb meat, a Likert 5-point scale was used.

¹ Items included in the ranking scale for production aspects: i) animal feeding, ii) animal breed, iii) production system, iv) environmentally friendly production system, v) correct disease control, vi) production system respectful of animal welfare, vii) hygiene practices on farm. Items included in the ranking scale for quality attributes: i) price, ii) quality label, iii) production region, iv) production system respectful of animal welfare, v) animal feeding, vi) environmentally friendly production system, vii) direct appraisal (colour, freshness, fat, others).

To obtain information on the lifestyle of buyers a discrete scale from 1 to 5 was used, with 5 as the highest level of concern in relation to a series of given statements. The statements used to evaluate attitudes and lifestyles of respondents appear in the Appendix. The data were analysed using the SPSS 14.0 version statistical package.

In order to identify determining factors that affect and motivate consumers to purchase quality-labelled lamb meat, following the approach used by Sepúlveda et al. (2008), the 371 respondents were divided into three groups of buyers depending on their habit of buying quality-labelled lamb meat which is the general variable to be compared. The first group, which has been termed “habitual buyers”, is characterised by those consumers who always or normally purchase meat with a “quality label”. The second group, entitled “regular buyers”, is characterised by those who normally buy quality-labelled meat. Lastly, the third group comprises “sporadic buyers”, characterized by those who sporadically purchase quality-labelled meat depending on the price or availability; those respondents who indicated that they do not purchase quality-labelled lamb meat formed 0.9% of this group. The belonging to each group also measures the degree of loyalty of the respondents to the quality label (brand), considering that habitual buyers have a high degree of loyalty, regular buyers an average degree of loyalty and sporadic buyers, little loyalty to the brand. The socio-demographic characteristics of the sample are shown in Table 1.

Considering the sample in general, females and lack of children under the age of 6 in the household shows the highest percentage of participation, which is reflected when describing each of the groups; whilst characteristics such as level of education and age range of the respondent have a more disperse distribution. The age ranges are logical given that a proportionate allocation was carried out by age groups.

122

123 In the blocks of questions related to the attitudes of the respondents (Likert scale) towards the
 124 purchase of lamb meat and lifestyles (discrete scale), factor analyses were applied to
 125 synthesise and reduce the information (Uriel & Aldas, 2005) (see Appendix). The method
 126 used to extract factors was that of main components and the factor scores in each analysis
 127 were estimated by the regression method.

128

129 To identify the factors that determine the differences between the three groups of buyers a
 130 binary logistic regression (logit) between each pair of groups was carried out, as shown in the
 131 Table 2. In the dependent variable in the binary logistic regression only two alternatives are
 132 considered which means that each individual in the sample has to be ascribed to one of these
 133 alternatives. In the proposed models G_i is an observable variable that only has two values 0 or
 134 1, i.e., belonging to either of the two groups in each comparison pair (model) (Table 2). Thus,
 135 $P_i/1-P_i=e^{Z_i}$ is the odd ratio of $G_i=1$ being observed rather than $G_i=0$ being observed, bearing
 136 in mind the whole set of explanatory variables X_j . Applying the $\ln$ to e^{Z_i} $\ln(e^{Z_i})=Z_i$ is
 137 obtained, where Z_i expressed as a multiple linear regression (Table 2), is the $\ln$ of the odd
 138 ratio. Moreover, by the partial derivation of e^{Z_i} in relation to X_j $\partial e^{Z_i}/\partial X_{ji}=e^{B_j}$ was obtained,
 139 where e^{B_j} is the odd ratio of $G_i=1$ being observed rather than $G_i=0$, when an explanatory
 140 variable X_j increases by one unit whilst the rest of the explanatory variables remain constant.
 141 The coefficients produced by the SPSS are β_0 and β_j as well as the e^{β_j} values. The β_0 and β_j
 142 coefficients correspond to the linear probability regression and the e^{β_j} coefficients correspond
 143 to the partial odd ratio. Hence the sign of β_j indicates if the probability of observing $G_i=1$
 144 increases or decreases when there is a unit increase in the X_j variable. When analysing and
 145 interpreting the results, the sign of each β_j estimated will be taken into account.

146

The initial explanatory variables (X_j) selected to construct the models were those that showed a certain significantly dependent relationship with the groups of buyers in the bivariate analyses. The factors obtained in the factor analyses were also included since they contain summarized information on various parameters that are considered to be potentially discriminatory, whilst also reducing possible problems of multi-collinearity by grouping together explanatory variables that are correlated. The specifications of the variables that formed part of the final model are given in Table 3.

As can be seen in Table 3, age range and the presence of children in the household were included in the socio-demographic variables. Whilst the first variable was included because the biavariate analyses showed that it had a significant relationship of dependency with the groups of buyers, the second was included when, following logit analysis, it was seen to improve the construction of the final models. Level of education, in spite of the fact that it helped discriminate between groups of buyers, was not included due to the high dependency relationship that it had with age range, which could lead to problems of multi-collinearity. The income variable was not taken into account in the analyses due to the high percentage of missing data in responses and to the non-presence of missing completely at random distributions.

For the final selection of variables to be included in the models, Wald's regression method was used based on the initial variables selected (Silva & Barroso, 2004). In each case the model with the best fit and which offered the greatest number of variables possible was selected since the aim was to obtain explanatory models rather than predicative ones. Estimation of parameters was carried out by means of the maximum likelihood function. The final models were selected taking into account the following criteria: (i) Nagelkerke R square

and the classification table; (ii) Wald statistics for the selection of the most significant variables (Silva & Barroso, 2004; Uriel & Aldas, 2005).

3. Results and Discussion

The estimates of the three models, after applying the regression methods for the final selection of variables, are presented in Table 4 and show the β coefficients for each variable and their respective *odd ratio*, that is, e^{β} , as well as their Wald's test level of significance.

Together, models 1 and 3 aim to identify the variables that could differentiate between meat buyers with high (habitual and occasional buyers) and low (sporadic buyers) loyalty to quality-labelled lamb meat, whilst model 2 aims to establish the differences that may exist between the two groups of buyers of lamb meat with the greatest loyalty to the quality-labelled product. In general terms, the buyers who are less loyal to quality labels, in comparison to the rest of the groups of buyers, consider the production region to be quality cue to a lesser degree. This highlights the link that exists between labels that designate an origin and the region of origin, in forming quality expectations at the time of purchase for some consumer segments. However, for these same lamb meat buyers with less loyalty to quality labels, who do not place as much value on origin as a quality cue, other aspects related to production such as the animal feeding are highly valued as factors with an influence on finally obtaining quality lamb meat. Furthermore, whilst this group of buyers with a low brand loyalty, consider that quality-labelled meat is only bought because it indicates origin and has greater production controls, the two groups of buyers with the greatest brand loyalty associate this meat with a healthier, safer product and do not merely link it to a production region and production systems with greater controls.

In addition, when differentiating between the two groups of buyers with greatest brand loyalty (Model 2), variables such as age, frequency of lamb meat consumption, green and healthy lifestyle factor, the importance placed on direct appraisal of the meat at time of purchase, attitudes in relation to the production factor, health and safety factor and tradition, play an important role. Although the group with less brand loyalty consider the production factor to a greater extent, it is seen that within the two groups of buyers with greatest loyalty, the habitual buyers hold the production factor in greater consideration and this is a situation that is reflected in the negative signs of the β coefficients in models 1 and 3 and the positive sign in model 2.

In more specific terms, in model 1, the factors that have a significant influence and would seem to determine the differences between habitual buyers of quality-labelled lamb meat compared to sporadic buyers of this type of meat, i.e. between groups G1 and G3, are age, frequency of consumption, frequent place of purchase, the importance attributed to the production region as an aspect denoting the quality of the meat at the time of purchase, the importance given to animal feeding, as an aspect at farm level that may have an influence on finally obtaining quality lamb meat, the production factor and the health safety factor.

In respondents in the highest age ranges compared to the youngest, there is an increase in the probability of regularly buying quality-labelled lamb meat. With respect to age, whilst Angulo et al. (2005) and Sepúlveda et al. (2008) found that although age is related to the purchase of quality-labelled meat, it does not play such a significant role, Wachenheim et al. (2000) and Martínez et al. (2007) agree on the significant influence of age, in that the older the buyers the greater the probability is that they will buy quality-labelled meat. Therefore, these results are congruent with those obtained by Wachenheim et al. (2000) and Martínez et

al. (2007) and, as pointed out by Verbeke, Demey, Bosmans and Viaene (2005) could be due to the fact that older consumers appreciate this meat much more as it reminds them of former times whilst, for the youngest, meat is seen as a basic product in the diet.

In relation to frequency of consumption of lamb meat, it was detected that a high frequency of consumption compared to a low frequency bears more relation to habitual buyers of quality-labelled lamb meat than to sporadic buyers. These results are related to those obtained by Sepúlveda et al. (2008) for beef, in the sense that a high frequency of purchase was linked more to habitual buyers than to occasional buyers of quality-labelled meat. Furthermore, within buying habits, habitual buyers of quality-labelled lamb meat, place more importance on butcher's shops as the frequent place of purchase and considerably less on places such as supermarkets/hypermarkets, whilst sporadic buyers place considerably more importance on other places and less on butcher's shops which is similar to the results obtained by Sepulveda et al. (2008). According to Verbeke et al. (2005) this preference for butcher's shops may be due to the fact that the place of purchase seems to be a trustworthy way of finding good quality meat, thus buyers of quality-labelled meat place their trust in the butcher who inspires confidence and reassures them of the origin of the meat and the way in which it is produced. Also other aspects that are applied to butcher's shops such as, for example, a good service, a personalized service and well presented products, are aspects that may be important for consumers who buy premium quality meat.

On the other hand in the purchase process habitual buyers, compared to sporadic buyers of quality-labelled lamb meat, place more importance on the production region as an aspect denoting the quality of the meat, which indicates that the more a consumer values this aspect of production the more probable it is that they regularly purchase quality-labelled lamb meat.

This result is logical since meat with a quality label is frequently linked to a production region, as is the case of the PGIs. Bernabéu and Tendero (2005), Bernués et al. (2003), Gracia (2005), Sánchez et al. (2001) and Ulloa and Gil (2007) found that the origin of lamb meat is one of the aspects that is most highly valued by consumers.

Whilst habitual buyers place less importance on animal feeding as an aspect that, at farm level, may have an influence on obtaining quality lamb meat, the sporadic buyers place much more importance on this quality aspect at farm level. Hence, although animal feeding has been described by other authors (Bernués et al., 2003; Maza & Ramírez, 2006; Sepúlveda et al., 2008) as an aspect which is valued highly by consumers in general, our results indicate that in lamb meat this aspect is of greater interest to sporadic buyers of quality-labelled meat.

A more positive attitude towards quality-labelled lamb meat being safer and healthier is associated with habitual buyers and these results coincide with those presented by other authors (Barrena et al., 2003; Bernués et al., 2003; Gracia, 2005; Sánchez et al., 2001; Sepúlveda et al., 2008; Ulloa & Gil, 2007; Verbeke & Viaene, 1999), which indicates that consumption of quality-labelled meat is associated with a greater concern of consumers for safety and health. On the other hand, a more positive attitude towards buying quality-labelled lamb meat because it involves greater production controls and its origin is indicated, is more linked to sporadic buyers. This result is interesting since it shows that whilst habitual buyers acquire quality-labelled lamb meat mainly because it is safer and healthier, sporadic buyers believe that they do so mainly because it indicates the origin and offers greater production controls but at no time do they associate it with safer, more natural, healthier meat.

When differentiating between habitual and regular buyers of quality-labelled lamb meat (Model 2, groups G1 and G2), variables such as age, the presence of children in the household, frequency of consumption, lifestyles of respondents, level of importance given to direct appraisal as an aspect that provides information on the quality of the meat and attitudes towards production, health and safety and tradition factors, have a significant influence. As in model 1 the older respondents with a high frequency of consumption of lamb meat are more likely to be habitual buyers of quality-labelled meat.

Although in the case of the three groups of buyers direct appraisal as a means of obtaining information on the quality of lamb meat is the most relevant aspect for inferring quality at the time of purchase, the results indicate that this quality cue is more important for regular buyers of quality-labelled lamb meat. These results may be explained by attitudes towards production, health and safety and tradition factors and the lifestyles of the respondents. Whilst habitual buyers, in comparison to regular buyers, consider buying quality-labelled lamb meat more positively because it undergoes greater production controls, it is better for health, it is a natural product that provides a greater guarantee and is better tasting, regular buyers do not value these aspects as much. As for a better taste being attributed to quality-labelled meat by habitual buyers, the results coincide with those obtained by Ulloa and Gil (2007), who found that consumers associate the “Ternasco de Aragón” brand with a quality image based on its organoleptic qualities.

Furthermore, although the two groups of buyers consider that it is important to have a healthy diet, given that there are no significant differences between the groups with regards to this factor, habitual buyers have a lifestyle that is not as “green and healthy” as that of the regular buyers. Thus, if it is taken into account that the regular buyers, compared to the habitual

buyers, have a greater predisposition towards the desire for a healthier life but at the same time are not so convinced of the benefits of control, health and safety that are attributed to the consumption of quality-labelled lamb meat by the habitual buyers, it is probable that regular buyers place greater trust in direct appraisal as a way of inferring the quality of meat, in line with their personal interests.

In model 3 as in model 1, the level of importance attributed to the production region as a quality cue, the importance given to animal feeding as an aspect which, at farm level, may affect quality lamb meat and the attitude towards the production factor, play a significant role in differentiating between regular and occasional buyers. Furthermore, other variables, such as an active social life factor, the importance placed on direct appraisal as a quality cue and the attitude towards the intrinsic attributes factor, also play an important role in differentiating between groups G2 and G3.

Regular buyers, in comparison with sporadic buyers have a more positive attitude towards the intrinsic attributes factor (less fat, is more tender and better looking (colour, freshness)). This variable only allows differentiation in model 3, but not in model 1 and 2, and bearing in mind the positive and negative signs that this variable has in models 1 and 2 respectively, it can be inferred that regular buyers, as compared to the other groups, rate the intrinsic attributes more highly, but that significant differences can only be found when comparing groups G2 and G3. Thus, as in the case in which groups G1 and G2 were compared, it is found that for the regular buyers there is a relationship between the importance attributed to direct appraisal as a quality cue and the intrinsic attributes ascribed to quality-labelled lamb meat.

With regards to lifestyle, regular buyers in comparison to sporadic buyers have a lifestyle that is more characterised by eating out and frequent travelling. Finally it is noted that whilst regular buyers rate, to a lesser extent, the importance of animal feeding as an aspect which at farm level can affect quality lamb meat, sporadic buyers attribute much more importance to this aspect of quality at farm level.

In relation to the measures of the model fit, in general Nagelkerke R square and the classification tables reveal an acceptable fit for the three models. In the case of the Nagelkerke R square, it provides a better fit for model 1 with an R square of 0.452 compared to 0.305 for model 2 and 0.282 for model 3. In agreement with the aforementioned, the classification tables also show a better total prediction for model 1, followed, in order of importance, by model 2 and, finally, by model 3 (Table 5).

Model 1 offers a good capacity of global and group prediction whilst model 2, despite its fairly acceptable capacity of global prediction, provides better group prediction for the group of habitual buyers. In model 3 global and group prediction works on a similar level. The lesser predictive capacity of models 2 and 3 may be due to the non inclusion of other possibly differentiating variables, which have not been taken into account in the estimates as they are not known.

4. Conclusions

Buyers who acquire quality-labelled meat sporadically mainly associate the quality label with a product that has greater production controls and whose origin is indicated, but at no time do they associate it with a healthier meat that provides greater guarantees. On the other hand,

consumers that are very loyal to the quality label associate this label with a product that offers greater guarantees and is healthier. This highlights the role played by quality labels such as the Protected Geographical Indications (PGIs) in gaining the consumer's trust, whilst such labels also lead to greater value being placed on traditional products.

Direct appraisal as a quality cue is the aspect most valued by all groups of buyers to infer the quality of meat at the time of purchase. However, this quality cue is mostly used by regular buyers of quality-labelled meat. Probably a great concern for aspects related to their health and less credence in quality labels as quality cues leads to more importance being placed on direct appraisal. This group of buyers also considers that quality-labelled lamb meat has better intrinsic attributes.

The buyers who are less loyal to quality labels, in comparison to the rest of the groups of buyers, consider the production region to be quality cue to a lesser degree. This highlights the link that exists between labels that designate an origin and the region of origin, in forming quality expectations at the time of purchase for some consumer segments. However, for these same lamb meat buyers with less loyalty to quality labels, who do not place as much value on origin as a quality cue, other aspects related to production such as animal feeding are highly valued as factors with an influence on obtaining quality lamb meat.

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Appendix. Results of factor analysis included in the models

370 Factor analysis for attitudes of respondents towards quality-labelled lamb meat.

Likert scale. Attitudes towards lamb meat with a PGI. Lamb meat with a quality designation (PGI) in relation to lamb meat which does not have this designation is bought because...	Components			
	Production factor	Health and safety factor	Intrinsic attributes factors	Tradition factor
There are more production controls	0.85			
It indicates the origin/ production region	0.75			
It healthier		0.77		
It is considered to be a natural product		0.70		
It offers greater guarantees		0.62		
It is better because of the animal production system	0.41	0.43		
It has less fat			0.80	
It is more tender			0.65	
It has a better appearance (colour, freshness)			0.61	
It tastes better				0.82
It is considered to be a traditional product				0.58
Percentage of explained variance	32.7%	13.4%	10.2%	9.6%

371

372 Factor analysis for lifestyles of respondents.

Lifestyles of respondents (Statements used in the discrete evaluation scale to evaluate the lifestyles of respondents)	Components		
	Healthy food factor	“Green, healthy life” factor	Active social life factor
I frequently eat fruit and vegetables.	0.90		
I have a healthy diet	0.89		
I frequently go on trips into the countryside		0.75	
I do physical exercise every week		0.66	
I am interested in information related to food	0.49	0.52	
I recycle waste correctly		0.43	
I frequently eat out			0.87
I travel and I like to travel frequently			0.62
Percentage of explained variance	29.7%	18.6%	12.6%

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Table 1. Socio-demographic characterisation of the sample by groups of buyers and characterisation of population

Variable	Groups of buyers of quality-labelled lamb meat (sample)			Significance	Population ^a
	Habitual buyers	Regular buyers	Sporadic buyers		
	n=136	n=105	n=110		
Sex					
Male	43.7%	35.6%	40.0%	Ns.	48.1%
Female	56.3%	64.4%	60.0%		51.9%
Age of respondent					
15 to 24 years	2.9%	15.2%	20.9%	***	12.2%
25 to 34 years	15.4%	19.0%	20.0%		19.3%
35 to 49 years	25.7%	34.3%	31.8%		27.1%
50 to 64 years	27.2%	16.2%	17.3%		21.0%
=> 65 years	28.7%	15.2%	10.0%		20.4%
Level of education					
Basic	45.6%	23.3%	23.1%	***	44.3%
Intermediate	27.2%	38.8%	36.1%		45.7%
Higher	27.2%	37.9%	40.7%		10.0%
Presence of children in the household =< 6 years					
No	81.8%	84.8%	86.9%	Ns.	Na.
Yes	18.2%	15.2%	13.1%		
Number of members of household (mean - median)					
	2.78 – 3.00	2.82 – 3.00	2.67 - 2.50	Ns.	2.7

Note: ***Significance at 0.01. Ns. Non significance at 0.05. Na. Not available. ^aInformation calculated from IAEST (Institute of Statistics of Aragón) (2007) and INE (Spanish Institute of Statistics) (2001) data.

Table 2. Model approach

Comparison	General model proposed for all of the comparisons
<p>Model 1</p> $G_i \begin{cases} G_i = 1 = G1 = \text{Group of habitual buyers} \\ G_i = 0 = G3 = \text{Group of sporadic buyers} \end{cases}$	$P_i = \text{Prob}(G_i = 1 / X_1, X_2, \dots, X_j) = \frac{1}{1 + e^{-Z_i}}$ $1 - P_i = \text{Prob}(G_i = 0 / X_1, X_2, \dots, X_j) = 1 - \left(\frac{1}{1 + e^{-Z_i}} \right)$ $\ln \left[\frac{P_i}{1 - P_i} \right] = Z_i = \beta_0 + \beta_1 X_{1i} + \dots + \beta_j X_{ji}; \text{ donde}$ <p>β_0 = model constant β_j = estimated parameter for variable X_j X_j = explanatory variable, and</p> $\frac{P_i}{1 - P_i} = \text{odd ratio} = e^{Z_i} = RA_i$
<p>Model 2</p> $G_i \begin{cases} G_i = 1 = G1 = \text{Group of habitual buyers} \\ G_i = 0 = G2 = \text{Group of regular buyers} \end{cases}$	$\frac{\partial RA_i}{\partial X_{ji}} = e^{B_j}$
<p>Model 3</p> $G_i \begin{cases} G_i = 1 = G2 = \text{Group of regular buyers} \\ G_i = 0 = G3 = \text{Group of sporadic buyers} \end{cases}$	

Table 3. Specification of variables included in the models

	Explanatory variables	Description
Person-related factors	Socio-demographic variables	
	age(1)= Young	1= Young age range. Between 25 and 34 years. 0= Very young age range. Between 15 and 24 years.
	age(2)= Intermediate	1= Intermediate age range. Between 35 and 50 years. 0= Very young age range. Between 15 and 24 years.
	age(3)= Adult	1= Adult age range. Between 50 and 65 years. 0= Very young age range. Between 15 and 24 years..
	age(4)= Older adult	1= Older adult age range. 65 years or older. 0= Very young age range. Between 15 and 24 years.
	prechildren= Presence of children in household	1= Children in household. 0= No children in household.
	Lamb meat purchase habits	
	frequconsu= Frequency with which respondent consumes lamb meat	1= Always or almost always. 0= Occasionally or never.
	expurchase= Experience in the purchase of lamb meat	1= Non expert. 0= Expert or averagely expert.
	Lifestyles of respondents	
	fhealthy= Healthy diet factor	Continuous variable. Factor scores of individuals with regard to healthy diet factor.
	fgreenheal= "Green, healthy" life factor	Continuous variable. Factor scores of individuals with regard to "green, healthy" life factor.
	factivesoc= Active social life factor	Continuous variable continua. Factor scores of individuals with regard to active social life factor.
Environment-related factors	frequplace= Frequent place of purchase of lamb meat	1= Traditional butcher's shop. 0= Other place (supermarkets/ hypermarkets).
Product-related factors	rankorigin= Level of importance of production region	Importance ascribed to the production region to obtain information on the quality of the lamb meat at the time of purchase (ranking).
	rankfrprod= Level of importance of environmentally friendly production system	Importance ascribed to environmentally friendly production system to obtain information on the quality of the lamb meat at the time of purchase (ranking).
	rankdirapp= Level of importance of direct appraisal	Importance ascribed to direct appraisal to obtain information on the quality of lamb meat at the time of purchase (ranking).
	rankanfeed= Level of importance of animal feeding	Importance ascribed, at farm level, to animal feeding to obtain quality lamb meat (ranking).
	rankabreed= Level of importance of animal breed	Importance ascribed, at farm level, to animal breed to obtain quality lamb meat (ranking).
Attitudes towards quality-labelled lamb meat	fproductio= Production factor	Continuous variable. Factor score of individuals with regard to production factor.
	fhealtsafe= Health and safety factor	Continuous variable. Factor score of individuals with regard to the health and safety factor.
	fintratrib= Intrinsic attributes factor	Continuous variable. Factor score of individuals with regard to the intrinsic attributes factor.
	ftradition= Tradition factor	Continuous variable. Factor scores for individuals with regard to the tradition factor.

Table 4. Estimation of parameters

Variables		Model 1		Model 2		Model 3		
		β	e^{β}	β	e^{β}	β	e^{β}	
Person-related factors	Socio-demographic	age(1)	1.85**	6.34	1.16	3.18	0.19	1.21
		age(2)	1.19	3.28	1.32*	3.73	-0.38	0.68
		age(3)	1.55**	4.71	2.30***	9.98	-0.88	0.41
		age(4)	1.46*	4.29	2.20***	9.02	-0.37	0.69
		prechildren	0.80	2.22	0.84*	2.32	Not included	
	Meat lamb purchasing habits	frequconsu	1.81***	6.10	0.74*	2.09	0.54	1.71
		expurchase	-0.11	0.89	-0.07	0.93	0.51	1.66
	Lifestyle of respondents	fhealthy	0.06	1.06	-0.01	0.99	Not included	
		fgreenheal	0.08	1.09	-0.28*	0.75	0.24	1.28
		factivesoc	-0.04	0.96	-0.20	0.82	0.39**	1.48
Environment-related factors		frequplace	0.74**	2.09	-0.12	0.89	Not included	
Product-related factors	rankorigin	0.18*	1.19	-0.06	0.94	0.19*	1.21	
	rankfrprod	-0.13	0.88	0.10	1.11	-0.17	0.85	
	rankdirapp	0.00	1.00	-0.19*	0.83	0.22**	1.24	
	rankanfeed	-0.26***	0.77	-0.09	0.91	-0.15*	0.86	
	rankabreed	0.07	1.07	0.02	1.02	0.14	1.15	
Attitudes towards quality-labelled lamb meat	fproductio	-0.41*	0.66	0.70**	2.01	-0.48**	0.62	
	fhealtsafe	0.60***	1.83	0.61**	1.83	Not included		
	fintratrib	0.22	1.24	-0.03	0.97	0.37*	1.45	
	ftradition	0.31	1.37	0.46**	1.58	Not included		
Constant		-2.60**	0.07	-0.58	0.56	-1.78**	0.17	

Note: The significance of variables was obtained by Wald's test. *Significance at 0.1; **significance at 0.05; ***significance at 0.01.

Table 5. Model classification table

Model	Type of buyers	% of correct group prediction ^a	% of correct global prediction ^b
Model 1 (Nagelkerke $R^2 = 0.452$)	G3: sporadic	70.9	77.1
	G1: habitual	82.3	
Model 2 (Nagelkerke $R^2 = 0.305$)	G2: regular	58.3	70.9
	G1: habitual	80.6	
Model 3 (Nagelkerke $R^2 = 0.282$)	G3: sporadic	68.9	67.3
	G2: regular	65.6	

^a Percentage of individuals correctly classed in the group. Cut-off point 0.5.

^b Percentage of individuals correctly classed for the overall sample. Cut-off point 0.5.