

INFORMATION DEMANDED BY CONSUMERS: NEW ISSUES IN VOLUNTARY BEEF LABELLING

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The aim of this work was to identify new issues of the information demanded by beef consumers toward voluntary labelling. For this purpose, a total of 353 surveys were carried out to beef buyers who reside in three Spanish cities. To analyse the consumers' demand information we used Chi-square tests. The results showed that information about sanitary and waste analysis and animal-rearing methods were the most demanded by consumers. Also, we found that there were clear links between the demand for information on the voluntary labelling of fresh beef and socio-demographic variables, such as gender, age, level of education, and the family income of the respondents.

Keywords: demand for information, beef labelling, food labelling.

Food labelling is a means by which consumers are given information about the products they consider buying (WANDEL, 1997; RIMAL, 2005). The limited availability of information for consumers and their restricted access to it may result in market failure, with consumers being hampered in making selections aligned with their preferences (GOLAN et al., 2001; LATVALA & KOLA, 2003; GELLYNCK et al., 2006). Hence, the labels help consumers to make product choices that better respond to their preferences. Also, they may help producers and intermediaries to increase revenue through differentiation (CASWELL, 1998). There are two types of food labelling: compulsory and voluntary (PRZYREMBEL, 2004). While the first is habitually used by governments to complement or replace governmental directives introduced as a means of reaching food quality and safety objectives and to provide information and protect consumers, most commonly with regard to the undesirable attributes of products (information asymmetry), the latter is essentially designed to encourage market competition on the basis of product differentiation (CASWELL, 1998; GOLAN et al., 2001; VERBEKE, 2005). In this line, and as a result of the past food safety crises affecting the beef industry in Europe, the European Union has brought in a compulsory system for identifying and registering livestock and a traceability and labelling system that enables product information to flow through the supply chain, and has also introduced the possibility of voluntary labelling for beef and beef-based products (GRACIA & ZEBALLOS, 2005; EC, 2000). This article focuses on voluntary labelling initiatives.

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Deciding on the content of the label is also a complex process. Even with the simplest of products there are many attributes that require labelling. It must also be remembered that consumers have an interest in widely varying characteristics (GOLAN et al., 2001; GELLYNCK, et al. 2006). Therefore, the information provided on labels may be effective when focusing on the issues of most concern to consumers, and may be processed and used by them (WANDEL, 1997; SALAÜN & FLORES, 2001; RIMAL, 2005). The issue of focusing on the information that the consumer is interested in is extremely relevant for a number of reasons. The first of them is the limited ability and willingness of people to process large amounts of information. The second reason involves the potentially adverse effects resulting from the consumers' indifference when faced with too much information (SALAÜN & FLORES, 2001; VERBEKE, 2005). A surfeit of irrelevant information may also result in a lack of comprehension leading to ignorance, boredom, and impatience (SALAÜN & FLORES, 2001; VERBEKE, 2005).

In addition, food labelling is increasingly becoming the most important means of informing consumers about food quality and safety (VERBEKE, 2005; GELLYNCK et al., 2006). In this respect, labels are seen as a sign indicating the meat quality (BREDAHL, 2004), above all when the aim is to present credence attributes as they help to convert these attributes into cues of extrinsic quality (CASWELL, 1998; BECKER, 2000; BERNUÉS et al., 2003; BREDAHL, 2004; VERBEKE, 2005). Credence attributes cannot be known even after having consumed the product or, on occasions, those with a high cost due to the adverse effects that they may cause on the consumer (BECKER, 2000). Credence attributes related with production systems, such as the animal feeding and origin, are among the issues that are most highly valued by consumers (SEPÚLVEDA et al., 2008).

Regarding the demand for information through meat labelling, WANDEL (1997), BERNUÉS and co-workers (2003), RIMAL (2005) and VERBEKE and WARD (2006) argue that it is related to socio-economic variables, such as gender, age, and the level of education.

In view of the above-mentioned, the purpose of this study was to identify which type of information on the voluntary labelling of beef in Spain is demanded most frequently, and to analyse the relationship between this information and certain socio-economic variables.

1. Materials and methods

The information used in this study was obtained from questionnaire-based personal surveys (face to face) carried out on a sample of the population formed by 353 beef buyers residing in Madrid, Zaragoza, and León, representative of large, medium-sized, and small Spanish cities, respectively. The surveys were carried out at several places of the cities with a high attendance of people, such as supermarket entries, universities, schools, parks, squares, and main streets. For a confidence interval in the results of 95.5% ($Z=2$) and assigning intermediate P and q values ($P=0.5$ and $q=0.5$) an overall sample error of 5.2% was obtained, which is considered acceptable. To achieve representativeness in terms of age, the sampling that was carried out during the months of March and April 2007, was stratified with an equal allocation between cities (Madrid $n=122$, Zaragoza $n=121$, León $n=121$), and proportionate allocation by age ranges in each of them. Age was selected for stratification because unlike other demographic variables, e.g. gender, income level, and level of education, it seems to be more closely related with meat consumption (SCHNETTLER et al., 2008).

Prior to the design of the questionnaire, a "focus group" was developed in Zaragoza with the participation of nine beef buyers, mainly women over the age of 30 who were

responsible for purchasing beef for their households. The information obtained allowed an improved questionnaire to be designed as well as providing greater insight into the results after analysis (DE CARLOS et al., 2005).

The closed-type questionnaire comprised questions with different types of measurement scales in the responses. An evaluation scale of 1 to 5 was used to measure the respondents' interest in accessing seven items of information that may be included on beef labels as part of voluntary labelling initiatives, where 1=none or very little importance, 2=little importance, 3=average importance, 4=quite a lot of importance, and 5=a lot of importance (see Appendix 1). The seven items of information included in the questionnaire were: i) nutritional information, ii) maturation time, iii) cooking tips, iv) animal-rearing methods, v) sensory analysis, vi) sanitary and waste analysis, and vii) quality control body. Also, respondents were asked about the willingness to pay for accessing the information that they considerate quite a lot important and very important using a nominal scale, where 1=willingness to pay: nothing or up to 2% and 2=willingness to pay: 5% or more. The questionnaire also included socio-demographics variables, such as gender, level of education, age of the respondent, and family income.

The socio-demographic characteristics of the respondents are detailed in Table 1. The 69.6% of the respondents were women and they also featured a high percentage of people with university degree. All income levels were equally represented except the lowest one, where the percentage representation was smaller compared to other income ranges. Age was broadly represented in all income ranges. The survey was taken with respondents of various beef purchasing frequencies. The 23.7% of the respondents indicated purchasing beef more than once a week, 48.4% purchased beef once a week, 20.8% purchased beef less than once a week, and the remaining 7.1% of the respondents purchased beef less than once a month.

Table 1. Socio-demographic characterization of the survey group

Socio-demographic characteristics		Percentage
Gender	Male	30.4
	Female	69.6
Level of education	No studies or elementary level	25.9
	Intermediate	26.5
	University degree	47.6
Age of respondent (range)	65 or over	20.2
	50–64	20.7
	35–49	26.7
	25–34	19.3
	24 and under	13.1
Family income/month	High level of income. Over €3001 per month	26.8
	Medium-high level of income. Between €1800 and €3000/ month	30.2
	Low-medium level of income. €901 and €1800/ month	32.2
	Low level of income. €900/ month and under	10.8

Once the information was tabulated, seven binomial variables called demand for information were created in the set of questions about respondents' interest in accessing information. These variables corresponded to the seven items of information shown to respondents and which may be included on the labels, where answers with values of 1, 2 and 3 equated to no or little interest in accessing the information, while options 4 and 5 equated to a significant interest in accessing the information. These seven variables were created to facilitate statistical analysis. SPSS version 14.0 was used to analyse the data.

1.1. Information demanded by consumers

To analyse the relationship between the seven variables about demand for information with willingness to pay and socio-economic variables, all these variables being of nominal type, contingency tables with Chi-square test were prepared (URIEL & ALDAS, 2005). Using the results of the bivariate analyses (Chi-square tests), a graph showing the results obtained was drawn (Fig. 1). The graph called interrelations tree, contained the results relating willingness to pay, demand for information, and socio-demographic variables. We have chosen this graph to present the results, because it provides a visualization of the interrelationships between all variables under study.

Although multiple correspondence analysis is a multivariate statistical technique used to analyse the pattern of relationships of several categorical dependent variables providing the same time a solution graph (ABDI & VALENTIN, 2007), this technique was not used in our study, because having many variables, as in our case 12 variables, makes the solution graph very difficult to interpret.

In our interrelations tree, the information relating to willingness to pay and demand for information is presented as a classification tree (left side of graph), and the results of the bivariate analyses obtained as a result of linking the demand for information and socio-demographic variables are presented as an interrelation tree (right side). The lines in the graphs (Fig. 1) indicate the interrelations between the variables. The more significant P values corresponding to Chi-square tests were included in each line.

2. Results and discussion

The information beef buyers were most interested in was the sanitary and waste analysis carried out and the animal-rearing methods. These results are similar to those obtained by WANDEL (1997), BERNUÉS and co-workers (2003), and RIMAL (2005). The 77.1% of the 353 respondents said they were quite or very interested in having information on the sanitary and waste analyses that were carried out, with 67.4% expressing the same level of interest in accessing information on the animal-rearing methods (Table 2). In contrast, information regarding cooking tips and sensory analysis (hardness, juiciness, and colour) attracted the least amount of interest among consumers.

It was also found that the demand for information on beef labelling is linked to socio-economic variables, such as gender, age, the level of education, and the monthly income of the respondent's household (WANDEL, 1997; RIMAL, 2005; VERBEKE & WARD, 2006), as shown in Fig. 1 on the right side.

Our results show that gender has a significant dependency relationship with the demand for information on recipes and nutritional values, in the sense that women are more likely than men to access this information. The former may be due to the important role that women

continue to play in taking responsibility for food at home, while the latter may be attributed to the fact that women are more likely to read information relating to food additives on labelling, particularly if they have a university degree, live with children, or are on special diets (WANDEL, 1997; RIMAL, 2005; LOUREIRO et al., 2006; GRUNERT & WILLS, 2007).

Table 2. Percentage of respondents with a high interest in accessing information

Demand for information	% of respondents interested ^a
Sanitary and waste analysis	77.1
Animal-rearing methods	67.4
Nutritional information	58.4
Quality control body	51.8
Maturation time	50.7
Cooking tips	43.9
Sensory analysis	43.1

^aThe right column refers to the % of respondents in the evaluation scale who showed quite a lot or a lot of interest in accessing information on the beef label

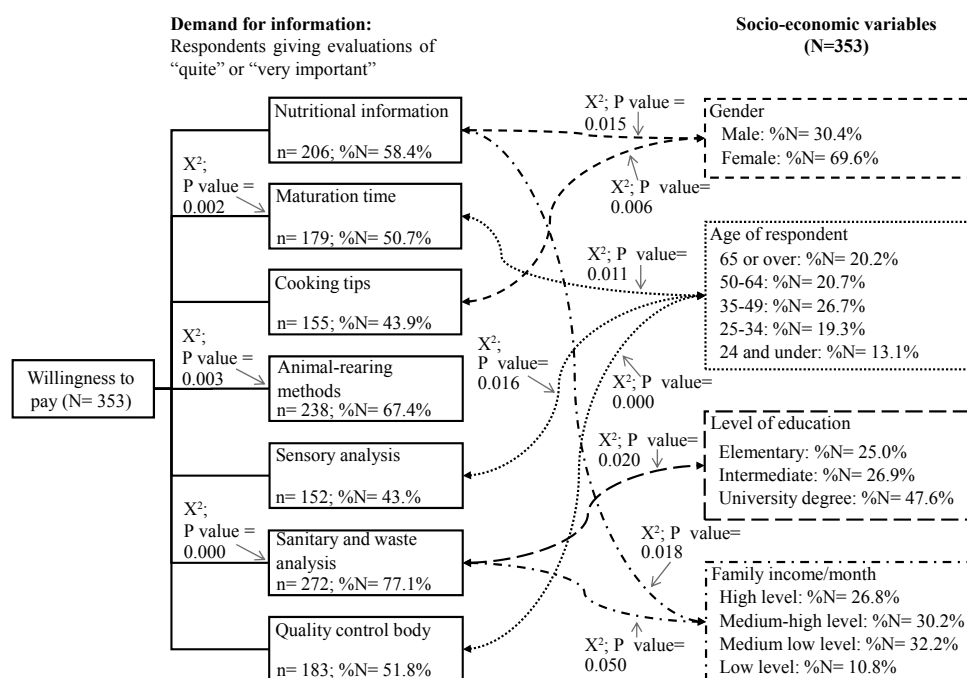


Fig. 1. Interrelation tree: willingness to pay, demand for information, and socio-economic variables (results of the Chi-square tests). The number (n) and percentage (%N) of the 353 respondents who showed quite a lot or a lot of interest in accessing the seven items of information is given on the left-hand side. The P value given on the left-hand side reveal the significant dependency relationship (Chi-square tests; X²) that exists between the willingness to pay and the interest the respondents have in accessing each items of information. The curved lines on the right side show the interrelation that exists between the socio-demographic variables and the demand for information. The P value relates to the significant dependency relationship (Chi-square tests; X²) that exists between the socio-demographic variables and the interest the respondents have in accessing each items of information

The results also show that there is a significant dependency relationship between the age of the respondent and demand for information on the maturation time, on analyses of the beef's sensory properties, and on the quality control body, the first two issues being directly related to information on sensory properties. Respondents expressing a high level of interest in accessing information on the maturation time and the quality control body could be found in a broad age range of between 25 and 65, while respondents expressing more of an interest in analyses of the beef's sensory properties (juiciness, hardness, colour, etc.) could be found in an intermediate age range of 35 to 65 years. In addition to the fact that the interest in reading information contained on labelling increases with age up to an approximate maximum of 50 years (WANDEL, 1997; BERNÚES et al., 2003; VERBEKE & WARD, 2006), the demand for information on sensory properties may be due to the existence of consumer segments whose evaluation of quality is limited to the sensory properties of the meat (BERNÚES et al., 2003; VERBEKE et al., 2005).

A significant dependency relationship was also discovered between the level of education of the respondents and the demand for information on the sanitary and waste analyses carried out. Respondents with higher levels of studies, particularly university graduates, showed a higher level of interest in this information, with 83.2% of them judging it to be very important. BERNÚES and co-workers (2003) and LOUREIRO and co-workers (2006) found that an increased demand for information on the label by consumers is positively linked to issues of health and food safety. GROSSMAN and KAESTNER (1997) indicate that there is a positive relationship between the level of education and health in the sense that someone who has been educated to a higher level is more willing to live a healthy life by making more informed decisions about the food they eat and their lifestyles than someone with a lower level of education. In addition, RIMAL (2005) proposes that consumers with a higher level of studies are more likely to read and use labels, perhaps because they possess a greater ability to process and analyse information, above all in issues where the information provided on labels is presented with a certain amount of technical detail. This series of relationships, to which GROSSMAN and KAESTNER (1997), BERNÚES and co-workers (2003), RIMAL (2005) and LOUREIRO and co-workers (2006) all refer, may help explain the results we have obtained.

The level of income in the respondent's family has a significant dependency relationship with the demand for information on the sanitary and waste analyses carried out and nutritional information in the respect that respondents with higher incomes had a much higher level of interest in these two types of information than respondents with lower incomes. This relationship may be explained if the significant dependency relationship (Chi-square test, P value <0.05) that exists between the level of income and the level of education is taken into account, in that sense higher level of education is related with higher income in the household.

On the other hand, no significance relation was found between the demand for information on the animal-rearing methods and socio-demographics variables. Taking into account that this aspect was one of the more ranked by consumers and no significance relation with socio-demographics variables was found, it can be assumed that the animal rearing methods are of general interest for consumers. However, some aspect linked to animal rearing methods, such as animal feeding, friendly environmental production systems, and animal welfare, are increasingly important for consumers and general people (GELLYNCK et al., 2006; SEPÚLVEDA et al., 2008).

As part of the information shown to the respondents, detailed on the left-hand side of Fig. 1, only the issues relating to the maturation time, animal-rearing methods, and the availability of information on the sanitary and waste analyses carried out have a highly

significant dependency relationship with willingness to pay. With regard to these items, a significant proportion of respondents (21.3%, 30%, and 34.9%) said they were prepared to pay an extra 5% or more for accessing this information. Although buyers expressed a general interest in accessing the rest of the information that was revealed, no significant dependency relationship was detected between these items and willingness to pay. Like the results obtained by LATVALA and KOLA (2003) and GRUNERT and WILLS (2007) our results show that greater demand for information and greater willingness to pay for it are based on issues of food safety.

3. Conclusions

There are clear links between the demand for information on the voluntary labelling of fresh beef and socio-demographic variables, such as gender, age, level of education and the family income of the respondents. Out of all the various types of information respondents were shown, the greatest demand was for the sanitary and waste analyses carried out, animal-rearing methods, and issues associated with the credence attributes of meat, such as food safety and production processes.

With regard to the willingness to pay for information, only the issues relating to the maturation time, animal-rearing methods, and the availability of information on the sanitary and waste analyses carried out have a highly significant dependency relationship with it. A proportion of consumers said they were prepared to pay an extra 5% or more for accessing this information.

Appendix 1. Question used to measure the respondents' interest in accessing the information. Abridged version.

The information presented below do not normally appear on the labels of meat currently sold in Spain. On this basis, what level of importance would the following information have for you when buying beef?

	None or very little	Little	Average	Quite a lot	A lot	Missing
	(1)	(2)	(3)	(4)	(5)	(0)
Nutritional information						
Maturation time						
Cooking tips						
Animal-rearing methods						
Sensory analysis						
Sanitary and waste analysis						
Quality control body						

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