INFLUENCE OF PRODUCT PERCEPTION AND QUALITY LABEL VALUATION ON CONSUMER DECISION. THE CASE OF BEEF IN ITALY AND SPAIN

RAMO BARRENA, MERCEDES SÁNCHEZ
Universidad Pública de Navarra, Pamplona (Spain)
e-mail: mersan@unavarra.es, phone: 34-948-169396
FRANCO ROSA
Universidad di Udine, Udine (Italy)
e-mail: rosa@uniud.it

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Summary

The consumer perception of the relation between food and health is increased his importance. This situation generates business opportunities, when his effect is positive (for example 'functional food'), or limitations or reductions in the markets (for example 'food with risk perception'). This paper trait to present the relation between consumer perception of 1) intrinsic and extrinsic product attributes and 2) the influenced aspects on the label valuation on the product confidence and consumption reduction, in one market with risk perception (beef). The data has been obtained in two European Regions: Friuli-Venezia-Giulia in Italy and Navarra in Spain, differentiated in commercial aspects related fundamentally with the product differentiation. The principal information is based on a home consumer survey designed ad hoc. The structural equation model to multi-group analysis has been the main methodology selected to explain the data. The results showed similarities in different aspects on consumer behaviour independently of the market distance, and the influence of the commercial aspects in the valuations and consumer decisions. So that, the market more differentiated (Spain-region) is best protected to the alternative type of scares.

Key Words: Consumer behaviour, Label, Structural Equation Model, Multi-Group Analysis, Beef.

JEL: M31, Q13

1. Introduction

The influence of relation between food and health increase for the consumers into the development countries. This situation has generated opportunities and advances to different activity sectors, but in others have emerged important problems with difficult to recuperate or to resolve. In this negative scene arte the sectors with food scares. Between them, the beef sector has received an important impact in this development, especially for the long consumer confidence recuperation. The main discussion propose in this paper will be around of this problem, if the recuperation is difficult, maybe is better to have before the scare one market situation more protected.

To test this idea has been selected two European regions situated in different countries, Friuli-Venezia-Giulia in Italy and Navarra in Spain. These regions have similarities on product implication (beef) and have differences with the commercial strategies employed. Additionally, these factors will help to explain other hypothesis related with two important aspects in the consumer behaviour: i) the product attributes perceptions and ii) the quality label consumer evaluation.

In relation with the importance of product attributes perceptions on the consumer reactions emphasizes the literature related with the quality approach. With respect to this topic, the consumer behaviour literature oriented the discussion around the consumer preferences structure using four approaches: 1) the multi-attribute approach , 2) the information theory approach 3) an approach based on hierarchical models, and 4) an approach based on integrating models (Grunert, 1997, 2002, Steenkamp, 1989, 1998). The multi-attribute and information theory alternatives are closely analysed in this paper. The multi-attribute perspective classifies the attributes into intrinsic and extrinsic. Different papers employing this approach have emphasised the contributions of Caswell (2001) in the American context and in the European market Nielsen (1998 and 2001) showed the relevance of extrinsic aspects, Becker et al. (1998), Umberger et al., (2000), Bernués et al., (2001) and Olaizola et al. (2001) studied the extrinsic aspects like quality signals. The information theory, meanwhile, classified the attributes into three types (Caswell, 2001): search, experience and credence. The search attributes are important to the consumer before buying the product, experience attributes are identified and

evaluated post purchase, while the credence attributes can not be identified either before or after purchase. Different papers have recently employed this approach in the analysis of consumer behaviour (Issanchou, (1996), Bello and Calvo (1998 and 2000), West et al (2001), McCarthy and Henson (2003), Latvala and Kola (2004), Grunert et al. (2004), Flake and Patterson (1999), Hanf (2003) and Schroeter and Foster (2004)).

In addition to these papers, there are other works that focus fundamentally on one of these different aspects. In this research one of them is more important for us: labeling. The revision is extensive with the label. Three relations relevant to this paper have been established with the label: a) label and product origin, b) label and food safety and c) label and quality. Some European papers related to label and origin were: Latouche et al. (1998), Dransfield et al. (1998), Calvo (2001 and 2002), Sánchez et al. (2000), Zeballos and Gracia (2004). The relationship between label and food safety has been analysed, among others, by Loader and Hobbs (1999), Batra and Sinha (2000), Northen (2001), McCarthy and Henson (2003) and Latvala and Kola (2004). And, finally, with respect to the label-quality relationship emphasized the papers by Calvo (2002), Bredahl (2003), Verbecke and Viaene (1999), Verbecke (2001), Stefani and Henson (2001), Latvala and Kola (2004), Roosen et al. (2003) and Hobbs (2004). In general terms, these papers showed the increase of the relevance of credence attributes.

To finally this section other relevant aspect to us is the effect of the product implication on the consumer reactions. In this context Verbeke and Vackier (2004) explained the importance of this factor in Belgium in fresh meat. Holm and Mohl (2000) showed it in Denmark, Becker et al. (1998) studied the European situation, Hobbs (2004) related it with the risk and to definitely Steenkamp (1998), Bredahl (2003) and Roosen et al. (2003) joined the implication with the label.

The rest of the paper is organized as follows. Section two presents the methodology in two parts, first the survey design and data collection and second describes the multi-group structural equation modeling approach employed in this work. Section three discussed main results, and finally Section 4 provides the concluding remarks and possible further refinements.

2. Methodology

2.1. Survey design and data collection

Data come from a survey conducted to consumers in two European countries, Italy and Spain in 2003. Friuli-Venezia-Giulia in Italy and Navarra in Spain were selected because they area relatively important areas of beef production and consumption, and they have similar habitat and economic structure. The beef consumption frequency is similar between the two zones (see Table 1), beef is one meat type appreciate for these consumers. In production terms and in quantity consumption the data are not different, around 14 kg. of consumption per person and year and the 10% of European production. Additionally, the Spanish region (Navarra) is also an important area of production with a semi extensive beef production system and has a PGI beef quality label that represents around half of total beef consumption in this region (Beriáin, 2002).

Table 1. Initial dates about de markets (2003)

	ITALY	SPAIN
Production (millions of Ton)	1.133.037	652.490
% EU (15) (7.361.515 millions of Ton)	15,39 %	8,86 %
Beef Consumption (kg/person and year)	13,10	14,7
Deviation with regard to the average consumption of the EU (15) (18,5 kg/person and year)	-5,4	-3.8
Source: FAOSTAT		
Consumption frequency	7,1 %	0,0 %
Never	17,9 %	12,0 %
Less of once a week	70,2 %	81,4 %

Once a week More of once a week	4,8 %		18,0 %	
Beef consumption reduction Yes No	32,9 % 67,1 %		22,8 % 77,2 %	
Label consumption Yes No	51,0 % 49,0 %		85,0 % 15,0 %	
Confidence on meats	Mean	Standard deviation	Mean	Standard deviation
Chicken	3.01	0.88	3.64	0.80
Beef	3.06	0.82	3.93	0.69
Pork	3.24	0.78	3.65	0.74
Lamb	3.16	0.86	3.84	0.73
Source: Spain and Italy interview (2003)				

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Samples in the two regions were selected using a stratified random sample of food buyers on the basis of neighborhood and age. Two hundred fifty respondents were randomly selected and personally interviewed in Spain and one hundred twenty five were randomly selected in Italy. Respondents were the main food purchasers of food products in the household. The first question in the questionnaire was whether the interviewer usually eats meat at home. If the answer was not, he/she was not interviewed. So, only non-vegetarian consumers were considered. This decision does not induce any bias on the results because in the two Countries the rate of vegetarian consumers is marginal[1].

In relation with the survey structure in the first part of the questionnaire consumers were asked about their fresh meat consumption patterns: i) how often they eat different meat products (beef, chicken, pork and lamb, ii) current weekly beef consumption, iii) beef attributes perceptions, iv) whether they have reduced beef consumption, v) reasons of this reduction and substitution by other meats, vi) perceived beef consumption expertise and vii) the beef quality label aspects evaluation. Finally, they were asked about socio-demographic characteristics and lifestyles. The interrelations studied between these factors will be explain in more detail in the next section, with special reference of consumers consumption reduction.

In this sense, one of the more important differences observed in consumers behaviour in the two European regions is the impact of BSE[2] crisis in beef consumption (Table 1). In Italy, the proportion of consumers who decrease beef consumption is higher than in Spain (33% and 23% respectively). Moreover, the beef quality label consumption was different (51% in Italy and 85% in Spain). Other important initial result is the confidence level assigned to the different meats, beef received better evaluation in the market more protected or differentiated (Spain, 3.93 versus Italy 3.06 in a five scale where five is the major confidence). The beef consumption reduction is the key point of this analysis as the main aim is to get some insight on whether confidence in the beef production system, and, indirectly, the quality labeling policy have influenced consumers reduction in beef consumption.

2.2. Structural Equation Modeling. Multi-Group Analysis.

The methodological approach used in this paper is based on the structural equation modelling (SEM) (also called covariance structure analysis or latent variable analysis). Structural equation modelling is a multivariate technique that examines a series of dependence relationships simultaneously and it is particularly useful when one dependent variable can be an independent variable in following relationships (Hair et al., 1995). This technique combines aspects of the multiple regression (examining dependence relationships) and the factor analysis (representing unmeasured concepts or factors with multiple variables). The most important aspect to take into account in these models is that

[1] Some basic characteristics of the consumer sample has been included in the Anex (Table 1A).
[2] BSE: Bovine Spongiphorme Encephalopaty.

they are used as a confirmation of the structural theory behind the analyzed phenomenon. The estimation of multiple interrelated dependence relationships is not the single element of structural equation modeling. SEM also has the ability to incorporate latent variables into the analysis. A latent variable is a hypothesised and unobserved concept that can only be approximated by observable or measurable variables. The observed variables are called manifest variables or observable variables (Hair et al, 1999). Each latent variable is related to a set of observable indicator variables, which are assumed to be measured with error. Using standard notation (1):

$$\eta = B\,\eta + \Gamma\,\xi + \zeta \qquad (1)$$

where η is a vector of dependent latent variables, B is a matrix of coefficients relating the dependent latent variables one to each other, ξ is a vector of latent independent variables related to η by the matrix of coefficients Γ, and ζ is a vector of errors in the equations.

Since the η latent variables are unobservable, indicators are required to measure them. Thus the structural equation model is associated with two measurement models which take into account errors in the measurement of the η and ξ variables. The first one is given by (2):

$$x = \Lambda_x\,\xi + \delta \qquad (2)$$

where x is a vector of indicators of the exogenous (independent) latent variables ξ, Λ_x is a matrix of factor loadings or structural coefficients between the exogenous latent variables and the x indicators; and δ is measurement error. The second is given by (3):

$$y = \Lambda_y\,\eta + \varepsilon \qquad (3)$$

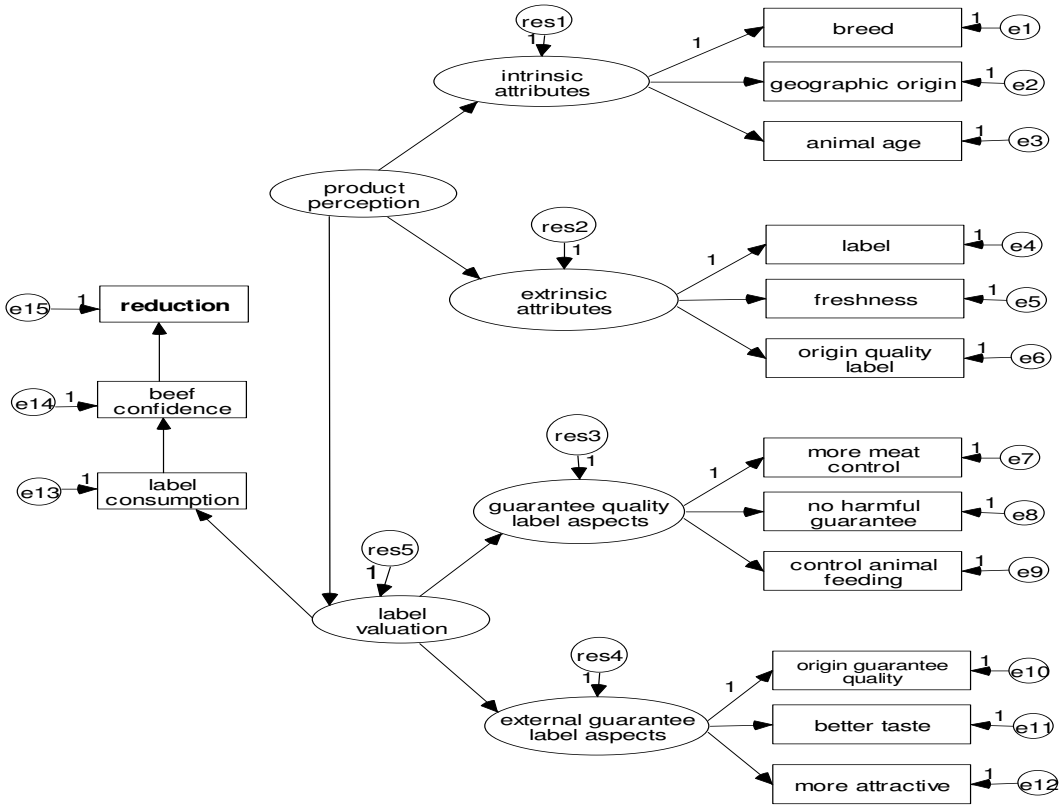
where y is a vector of indicators of the endogenous (dependent) latent variables η; and Λ_y is a matrix of factor loadings or structural coefficients between the endogenous latent variables and the y indicators; and ε is measurement error.

A structural equation model with latent variables can be seen as a composite of two models: a structural model and a measurement model. The structural model represents the relationships among the latent variables across the path diagram. In the path diagram a straight arrow indicates a causal relationship; and a curved arrow represented correlation between constructs, but not causation is implied (Hair et al., 1999). The measurement model specifies the rules of correspondence between manifest and latent variables. This sub model gives information about the reliability of each latent variable for the estimation of the causal relationships and to know if the observed variables serve to measure the latent variables (Jöreskog y Sörbom, 1993). This is the process when one model and group is analysed. But in this paper two groups have been studied. The Multi-Group alternative generated different models, each with a different set of cross-group constraints (Amos 5.0, Arbuckle, 2003). Empirical models were formulated using the package Amos 5.0 and the parameters were estimated using a maximum likelihood function. In this paper we can found two types of multi-group analysis. In first time the option related with factor analysis. In this situation three models will be estimated: 1) Measurement weights model, 2) Structural covariances model and 3) Measurement residuals model and obviously the default model or unconstrained alternative. In Measurement Weights model (factor loadings) the constraints are the equality of them across groups. In Structural Covariances model assumes all of the above and structural covariance (factor variances and covariances) are equal across groups and finally Measurement Residuals model tested if all parameters are equal across groups. In second time, when the paper researches the complete model, not only factor analysis, this methodology estimated two additional model, Structural Weights model (structural weight-regression weight is constant across groups) and Structural Residual Model (structural residual variance) are constant across groups.

In summary, the program generates a hierarchy of models in which each model contains all the constraints of its predecessor. The evaluation of the different model fit is the second stage of the analysis and helps to determine the differentiation level between groups. Like a common Structural Equation Modelling the evaluation starts with an initial inspection for offending estimates (estimated coefficients in either, the structural or measurement models, which exceed acceptable limits in all models. Once the model provides acceptable estimates, the goodness-of-fit must then be assessed at several levels: first for the overall model and then for the measurement and structural models separately. In this work initially the most commonly goodness-of-fit measures have been used: likelihood-ratio chi-square statistic (χ^2), goodness-of-fit index (GFI), root mean square error of approximation (RMSEA), adjusted goodness-of-fit index (AGFI) and comparative fit index (CFI) and others indicators to compare models Akaike Information Criterion (AIC), Browne-Cudeck Criterion (BCC) and Minimum Discrepancy divided by its degrees of freedom (CMIN/P) (Hair et al, 1999 ; Byrne, 2001, Arbuckle, 2003). Finally, the interpretation of the model is the most important stage to test whether the proposed model is according to the theory and the hypotheses state at the beginning.

In particular, the causal model propose in this study study is based on the theoretical model of the consumer decision process and behaviour defined by Engel et al., (1993); and on the causal model developed by Henson and Northen (2000) who establish the process by which consumers assess the safety of beef and on the different literature related with the effect of quality label showed below (Figure 1 to see path diagram). Two initial latent variables were selected. First, the beef attributes perception and second quality label valuation. Additionally, the beef attributes perception latent was formed by two factors. The first factor was related to intrinsic beef attributes or credence attributes (breed, geographical origin and animal age) and the second one to extrinsic or search attributes (label, freshness and origin quality label) (Andersen, 1994, Bello and Calvo, 2000, Caswell, 2001, Grunert, 1997). Table 2 includes the name of the variables selected in the causal model presented. Assuming that the reduction in beef consumption has mainly been motivated by the lack of confidence in the product, as Steenkamp (1989) says, intrinsic attributes usually present higher weights than extrinsic attributes, or it is possible that the extrinsic attributes are more important when the consumer has not the information about the product (Zeithmal (1998)) like can be on beef consumption. This is the first discussion of the paper.

Figure 1. Initial causal model of the reduction in beef consumption



The second important latent variable was the quality label aspects valuation and its influences on the beef confidence and consequently on consumption reduction. Two factors defined this concept. The first was related with guarantee quality label aspects (more meat control, no harmful guarantee and control animal feeding). The second was centered on external quality label factors (origin guarantee quality, better flavor or taste and more attractive). The relation between these central aspects, beef perception and quality label valuation has been analyzed and their influence on quality label consumption level. The influence of this interest to quality label with the beef confidence has been an other important aspect studied, joined to the relation between the confidence and the beef consumption reduction. The base argument is more confidence gives to less reduction.

Table 2. Means and standard deviation of attributes and label valuation in Spain and Italy (2003)

		ITALY		SPAIN	
Attributes		Mean	Standard deviation	Mean	Standard deviation
Factor 1 (intrinsic attributes)	Breed	2.62	1.40	1.98	1.08
	Geographic origin	3.67	1.34	3.62	1.20
	Animal age	3.12	1.42	3.11	1.30
Factor 2 (extrinsic attributes)	Label	3.75	1.29	3.30	1.22
	Freshness	4.61	0.73	4.46	0.77
	Designation of origin	3.47	1.17	4.06	1.03

		ITALY		SPAIN	
Label valuation		Mean	Standard deviation	Mean	Standard deviation
Factor 1 (guarantee quality label aspects)	More meat control	4.06	0.94	4.22	0.94
	No harmful guarantee	3.66	1.09	2.88	1.13
	Control animal feeding	3.90	0.85	3.67	0.99
Factor 2 (external guarantee label aspects)	Origin guarantee quality	2.90	1.10	4.09	1.06
	Better taste	2.49	1.21	3.17	1.15
	More attractive	2.22	1.38	2.36	1.31

3. Results

The results will be presented in different stages, because the multi-group structural equation analysis is difficult to complex model. Thus, the different factors have been studied separately and then the complete model will be discussed. Initially, Table 3 showed the means and standard deviations values assigned by the consumers to the different aspects evaluated in the partial models. To the beef attributes perception we can see a similar valuation of intrinsic attributes in the two countries, and best values in Spain to extrinsic aspects. Secondly in quality label evaluation the guarantee control aspects received similar means and there are any differences into the external quality attributes.

Table 3. Name of the variables used in the initial causal model

LATENT VARIABLES		OBSERVABLE VARIABLES
BEEF PERCEPTION	INTRINSIC ATTRIBUTES	BREED: breed of animal GEOGRAPHIC ORIGIN: geographic origin of beef ANIMAL AGE: age of animal
	EXTRINSIC ATTRIBUTES	LABEL: labelled beef FRESHNESS: freshness of beef ORIGIN QUALITY LABEL: the beef has label of designation of origin
LABEL VALUATION	GUARANTEE QUALITY LABEL ASPECTS	MORE MEAT CONTROLS: more quality controls in meat in general NO HARMFUL GUARANTEE: no use of harmful product in meat CONTROL ANIMAL FEEDING: control of animal feeding
	EXTERNAL GUARANTEE LABEL ASPECTS	ORIGIN GUARANTEE QUALITY: show the geographic origin of beef BETTER TASTE: have better taste MORE ATTRACTIVE: the meat is more attractive
		LABEL CONSUMPTION: quantity of beef label consumption BEEF CONFIDENCE: confidence on beef REDUCTION: reduction in beef consumption

Tables 4 and 5 summarize the results obtained to different four models generated in Multi-Group procedure to intrinsic and extrinsic attributes consumer perceptions. The results showed three values for each variable: Standard Regression Weight, Standard Error and Critical Ratio[3]. The main model fits selected indicate the equality on Measurement Weights on intrinsic attributes between the two

[3] The minimum level of Critical Ratio has been 2.

European regions (value of Chi-Square and p associated more than 0.05[4], and values of AGFI, AIC and BCC). So that, the beef breed and its origin are the most aspects to the consumers. All the parameters were significantly. On the other hand, to extrinsic attributes, the similarities were very important because all the models estimated in multi-group analyzed showed equality into the countries (Measurement Weights, Structural Covariances and Measurement Residuals). The label links to the origin and the label in general, were the most important aspects and in second stage was the freshness (this result has been obtained previously by other authors too). All the parameters were significantly.

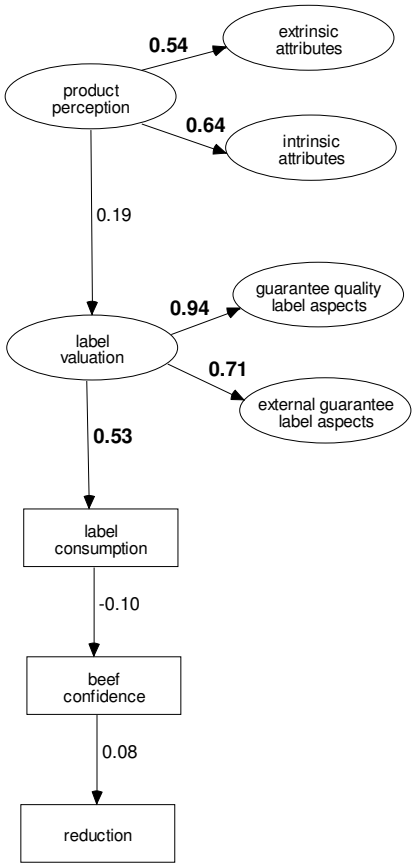
In relation with the quality label valuation import results were founded (Table 6 and 7). In the two cases Measurement Weights and Structural Covariances were equal between the two groups or regions. First, respect to the guarantee quality label aspects the animal feeding and the better meat control were the aspects more important to the consumers. In external factors the relation between origin and quality and the best taste were the aspects with more valuation. All the parameters were significantly.

Finally, Table 8 showed the results to the complete model. Interesting values were founded. Initially, the statistical significance of the relation between the beef label consumption and its valuation, so that, more valuation more acquisition. Although, it wasn't relation between label valuation and beef attributes perceptions. Other important result was the relevance of extrinsic attributes to the consumers. This result, maybe like any authors indicate can be indicates asymmetric information in this food market. The structure was similar between regions. Figure 2 summarized the Structural Model path to standardized parameter values. On the other hand, the factor that summarized the guarantee aspects of quality label was more important than external aspects, result very interesting to the quality label managers. This situation is similar into the two countries.

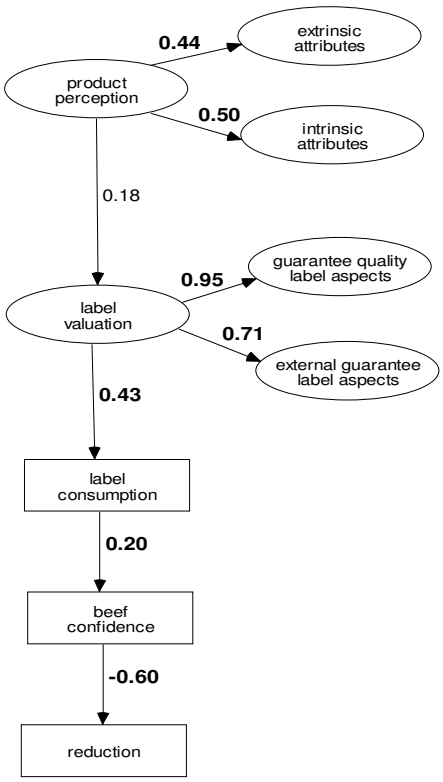
[4] When p value is more than 0.05 is possible to conclude that parameters constraints model assumed are certains.

Figure 2. Causal model of the reduction in the consumption of beef in Italy and Spain (in bold de significative parameters).

Italy



Spain



But, now we showed the principal difference founded in the results, that may be could explain the minor negative reaction in Spain to the BSE scare, with more real BSE cases in this zone than Italia area, the important relation in Spain between beef confidence and the quality label valuation. This area is branding or protected area in fact of Italian region with less beef differentiated police. In this sense, other result is relevant to emphasize in Spain, the statistical significative relation between consumption reduction and quality label consumption. So that, the importance relevance of the confidence on the consumer reactions. The model fit selected in this complete model showed acceptable levels for the different model estimated.

4. Concluding remarks.

Food scares that have taken place in the last years have increased consumers' concerns on food safety. The short-run impact has been the reduction in the consumption level of some food products directly related to those food scares. Beef is a good example in Europe. In last months, public and private promotion strategies have been oriented to the creation of guarantee labels (traceability) to overcome consumers' concerns. This paper has investigated main determinants of beef consumption reduction to assess the potential impact of such programs to recover consumers' confidence in beef, and therefore, consumption. Specially, we analysed the influence of beef attributes perceptions and quality label evaluation on confidence and consequently on consumer reduction.

A structural modelling approach with multi-group analysis has been used to analyse interrelationships in the consumer decision process. Two different European regions have been considered to take into account different production systems and different marketing strategies followed by farmers. Results indicate that consumption reduction is directly related to the perceived quality offered by farmers and other decision makers involved at different levels of the beef chain. The second main factor explaining the reduction is the consumer confidence to the quality labels. So that, the market with better differentiated strategy has more confidence and less reduction in the beef consumption. The main implication of the paper is that persuading in the development of a quality label and adequate communication strategies about how the meat is produce could recover consumers' confidence in beef in the near future and therefore, consumption. This result is more evident in the region where this quality label already exists. In this sense, we argue in favor of protected the market because this situation helps to the sector maintenance. Finally other important result of the paper is the similarities of the markets on the evaluation of beef attributes perceptions, with structures very equal between markets geographically removes. .

Further research in other regions or countries with other commercial situations or beef implication levels could reinforce the relevance of some commercial actuations to confront problems in the sectors. Finally, alternative methodologies could be used to check for results presented in this paper.

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Table 4. Intrinsic Attributes

Aspects	Unconstrained Model						Measurement Weights Model						Structural Covariances Model						Measurement Residuals Model					
	Italy			Spain			Italy			Spain			Italy			Spain			Italy			Spain		
	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.
Breed	0.692	*	*	0.399	*	*	0.665	*	*	0.465	*	*	0.529	*	*	0.529	*	*	0.528	*	*	0.528	*	*
Geographic Origin	0.673	0.221	4.15	0.233	0.265	2.4	0.617	0.189	4.71	0.391	0.189	4.71	0.420	0.193	4.26	0.419	0.193	4.26	0.421	0.194	4.26	0.421	0.194	4.26
Animal Age	0.481	0.206	3.38	0.725	0.944	2.3	0.596	0.208	4.67	0.402	0.208	4.67	0.531	0.256	4.53	0.554	0.256	4.53	0.546	0.256	4.53	0.546	0.256	4.53
Model Fit	χ^2 (2)=1.766 p=0.414 CMIN/DF=0.883 GFI= 0.996 AGFI= 0.978 AIC= 21.77 BCC= 22.49 RMSEA=0.000						χ^2 (4)=8.648 p=0.071 CMIN/DF= 2.162 GFI= 0.982 AGFI=0.947 AIC=24.65 BCC=25.22 RMSEA=0.061						χ^2 (5)=17.535 p=0.004 CMIN/DF= 3.507GFI= 0.959 AGFI=0.901AIC=31.54 BCC=32.04 RMSEA= 0.089						χ^2 (7)=17.808 p=0.013 414 CMIN/DF= 2.544 GFI= 0.958 AGFI= 0.928 AIC= 27.81 BCC= 28.17 RMSEA=0.07					

[a]SRW: Standard Regression Weight; S.E.: Standard Error; C.R.: Critical Ratio

Table 5. Extrinsic Attributes

Aspects	Unconstrained Model						Measurement Weights Model						Structural Covariances Model						Measurement Residuals Model					
	Italy			Spain			Italy			Spain			Italy			Spain			Italy			Spain		
	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.
Label	0.553	*	*	0.558	*	*	0.586	*	*	0.559	*	*	0.567	*	*	0.567	*	*	0.564	*	*	0.564	*	*
Freshness	0.484	0.201	2.64	0.162	0.095	1.88	0.267	0.084	3.10	0.239	0.084	3.10	0.248	0.084	3.04	0.238	0.084	3.04	0.248	0.085	3.09	0.248	0.085	3.09
Origin quality label	0.601	0.38	2.75	0.697	0.256	4.04	0.609	0.201	4.88	0.666	0.201	4.88	0.586	0.20	4.89	0.675	0.20	4.89	0.644	0.20	4.83	0.644	0.20	4.83
Model Fit	χ^2 (2)=5.08 p= 0.079CMIN/DF=2.541 GFI= 0.989 AGFI=0.931 AIC= 25.08 BCC= 25.81 RMSEA=0.070						χ^2 (4)=8.42 p=0.077 CMIN/DF=2.105 GFI=0.983 AGFI= 0.948 AIC= 24.42 BCC= 25.00 RMSEA=0.059						χ^2 (5)=8.573 p=0.127 CMIN/DF=1.715 GFI=0.983 AGFI= 0.958 AIC= 22.57 BCC= 23.08 RMSEA= 0.048						χ^2 (7)=12.29 p=0.091 CMIN/DF=1.755 GFI=0.972 AGFI=0.953 AIC= 22.29 BCC= 22.65 RMSEA= 0.049					

[a]SRW: Standard Regression Weight; S.E.: Standard Error; C.R.: Critical Ratio

Table 6. Guarantee quality label aspects

Aspects	Unconstrained Model						Measurement Weights Model						Structural Covariances Model						Measurement Residuals Model					
	Italy			Spain			Italy			Spain			Italy			Spain			Italy			Spain		
	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.
More meat control	0.706	*	*	0.517	*	*	0.639	*	*	0.556	*	*	0.612	*	*	0.576	*	*	0.565	*	*	0.565	*	*
Guarantee no harmful	0.510	0.218	4.14	0.512	0.24	5.09	0.534	0.16	6.68	0.497	0.16	6.68	0.508	0.162	6.67	0.258	0.16	6.66	0.507	0.17	6.44	0.507	0.17	6.44
Control animal feeding	0.888	0.27	4.20	0.761	0.346	4.40	0.938	0.22	6.05	0.736	0.22	6.05	0.925	0.23	5.97	0.319	0.23	5.97	0.794	0.25	5.68	0.794	0.25	5.68
Model Fit	χ^2 (2)=8.403 p=0.015 CMIN/DF=4.20 GFI=0.984 AGFI= 0.906AIC=28.4 BCC= 29.13 RMSEA=0.101						χ^2 (4)=9.44 p=0.051 CMIN/DF=2.36 GFI=0.983 AGFI=0.948 AIC=25.43 BCC= 26.01 RMSEA=0.066						χ^2 (5)=10.05 p= 0.074CMIN/DF=2.01 GFI=0.981 AGFI=0.954 AIC= 24.05 BCC=24.56 RMSEA=0.057						χ^2 (7)=22.33 p= 0.002 CMIN/DF= 3.19 GFI= 0.960AGFI=0.932 AIC= 32.32 BCC= 32.69 RMSEA=0.083					

[a]SRW: Standard Regression Weight; S.E.: Standard Error; C.R.: Critical Ratio

Table 7. External quality label aspects

Aspects	Unconstrained Model						Measurement Weights Model						Structural Covariances Model						Measurement Residuals Model					
	Italy			Spain			Italy			Spain			Italy			Spain			Italy			Spain		
	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.
Origin guarantee quality	0.569	*	*	0.394	*	*	0.501	*	*	0.446	*	*	0.476	*	*	0.446	*	*	0.441	*	*	0.441	*	*
Better taste (flavour)	0.354	0.247	2.68	0.477	0.41	3.18	0.425	0.24	3.88	0.406	0.24	3.89	0.414	0.25	3.80	0.414	0.25	3.80	0.444	0.29	3.68	0.444	0.29	3.68
More attractive	0.45	*	*	0.317	*	*	0.390	*	*	0.360	*	*	0.371	*	*	0.360	*	*	0.353	*	*	0.353	*	*
Model Fit	χ^2 (2)=0.390 p=0.823 CMIN/DF=0.195 GFI=0.999 AGFI= 0.995AIC=20.39 BCC= 21.17 RMSEA=0.000						χ^2 (3)=2.197 p= 0.532 CMIN/DF=0.732 GFI=0.995 AGFI=0.982 AIC=20.19 BCC= 20.85 RMSEA=0.000						χ^2 (4)=2.23 p= 0.694 CMIN/DF=0.557 GFI=0.995 AGFI= 0.986AIC=18.23 BCC= 18.81 RMSEA=0.000						χ^2 (7)=65.1 p= 0.000CMIN/DF= 9.29 GFI=0.908 AGFI= 0.843 AIC=75.06 BCC= 75.42 RMSEA=0.000					

[a]SRW: Standard Regression Weight; S.E.: Standard Error; C.R.: Critical Ratio

Table 8. Complete model to explain the relation between reduction in the consumption of beef and product perception and quality labels valuation

Aspects	Unconstrained Model						Measurement Weights Model						Structural Weights Model						Structural Covariances Model					
	Italy			Spain			Italy			Spain			Italy			Spain			Italy			Spain		
	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.
Label Valuation-Product perception	0.193	0.325	0.923	0.178	0.29	1.28	0.18	0.31	0.87	0.100	0.33	0.66	0.162	0.23	1.06	0.11	0.23	1.06	0.12	0.22	1.02	0.12	0.1	1.1
Label consumption-Label Valuation	0.532	0.15	4.64	0.434	0.02	6.78	0.196	0.03	9.53	0.614	0.03	9.53	0.195	0.03	9.53	0.61	0.03	9.53	0.19	0.02	9.49	0.61	0.1	9.5
Intrinsic attributes-Product perception (global)	0.548	*	*	0.436	*	*	0.559	*	*	0.418	*	*	0.561	*	*	0.42	*	*	0.47	*	*	0.47	*	*
Extrinsic attributes-Product perception (global)	0.548	*	*	0.436	*	*	0.559	*	*	0.418	*	*	0.561	*	*	0.42	*	*	0.47	*	*	0.47	*	*
Guarantee quality L.-Label Valuation (global)	0.906	*	*	1.155	*	*	0.861	*	*	0.971	*	*	0.86	*	*	0.97	*	*	0.86	*	*	0.97	*	*

External quality L.-Label Valuation (global)	0.714	*	*	0.713	*	*	0.713	*	*	0.709	*	*	0.712	*	*	0.71	*	*	0.71	*	*	0.71	*	*
Beef confidence-Label Consumption	-0.10	0.07	-0.89	0.201	0.119	3.13	-0.09	0.07	-0.82	0.215	0.11	3.37	0.07	0.07	0.81	0.03	0.06	0.80	0.07	0.06	0.81	0.03	0.1	0.8
Breed-Intr.	0.767	*	*	0.743	*	*	0.77	*	*	0.740	*	*	0.77	*	*	0.74	*	*	0.75	*	*	0.75	*	*
Geographic-Intr.	0.723	0.133	6.14	0.357	0.09	4.51	0.54	0.07	7.59	0.488	0.07	7.60	0.54	0.07	7.60	0.49	0.07	7.59	0.51	0.07	7.50	0.49	0.1	7,5
Animal age-Intr.	0.490	0.142	4.06	0.578	0.10	7.31	0.54	0.08	7.99	0.528	0.08	7.99	0.54	0.08	7.98	0.53	0.08	7.98	0.52	0.08	8.13	0.54	0.1	8,1
Label-Extr.	0.858	*	*	0.939	*	*	0.89	*	*	0.927	*	*	0.89	*	*	0.93	*	*	0.87	*	*	0.95	*	*
Freshness-Ex	0.291	0.08	2.24	0.055	0.041	0.79	0.11	0.04	1.70	0.101	0.04	1.70	0.11	0.04	1.68	0.10	0.04	1.70	0.10	0.04	1.61	0.10	0.1	1,6
Origin Quali-Extr	0.418	0.12	3.18	0.361	0.07	4.77	0.38	0.06	5.54	0.357	0.06	5.54	0.40	0.06	5.54	0.36	0.06	5.54	0.36	0.06	5.54	0.36	0.1	5.5
More contro-Guar. Label	0.870	*	*	0.801	*	*	0.89	*	*	0.847	*	*	0.89	*	*	0.85	*	*	0.89	*	*	0.85	*	*
No harmful-Guar. Label	0.778	0.097	8.71	0.555	0.092	8.17	0.73	0.06	11.72	0.588	0.06	11.72	0.72	0.06	11.71	0.59	0.06	11.71	0.72	0.06	11.71	0.59	0.1	11.7
Anim. Feeding-Gu.L	0.894	0.08	10.78	0.659	0.08	9.93	0.86	0.05	14.45	0.696	0.05	14.45	0.86	0.05	14.44	0.69	0.05	14.44	0.86	0.05	14.43	0.70	0,1	14.4
Origin-Ex.L	0.801	*	*	0.796	*	*	0.99	*	*	0.958	*	*	0.99	*	*	0.96	*	*	0.99	*	*	0.96	*	*
Taste-Ex.L.	0.907	0.08	12.43	0.705	0.06	11.14	0.29	0.05	4.85	0.274	0.05	4.85	0.29	0.05	4.85	0.28	0.05	4.85	0.29	0.05	4.89	0.28	0.1	4.8
Attractive-Ex. Label	0.900	0.09	12.28	-0.30	0.07	-4.21	0.23	0.05	3.87	0.22	0.05	3.87	0.23	0.05	3.86	0.22	0.05	3.86	0.23	0.05	3.84	0.22	0.1	3.8
Reduction-Confidence	0.079	0.06	0.72	-0.60	0.03	-11.5	0.08	0.06	0.72	-0.60	0.03	-11.5	-0.42	0.03	-10.1	-0.52	0.03	-10.1	-0.42	0.03	-10.1	-0.52	0.1	-10
Model Fit	χ^2 (186)=713 p=0.000 CMIN/DF= 3.83GFI=0.79AGFI= 0.73 AIC=821 BCC=838 RMSEA=0.095						χ^2 (195)=746.7 p=0.000 CMIN/DF= 3.83GFI=0.77AGFI=0.72 AIC=837 BCC= 851 RMSEA=0.095						χ^2 (198)=786.421 p=0.000 CMIN/DF= 3.98 GFI=0.76AGFI= 0.71AIC=870 BCC=884 RMSEA=0.097						χ^2 (199)=787.93 p=0.000 CMIN/DF= 3.96 GFI=0.76AGFI=0.71 AIC= 869 BCC=883 RMSEA=0.097					

[a]SRW: Standard Regression Weight; S.E.: Standard Error; C.R.: Critical Ratio

Table 8. Complete model to explain the relation between reduction in the consumption of beef and product perception and quality labels valuation (Continuated)

Aspects	Structural Residual Model						Measurement Residual Model					
	Italy			Spain			Italy			Spain		
	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.	[a]SRW	S.E.	C.R.
Label Valuation-Product perception	0.12	0.22	1.02	0.12	0.22	1.02	0.13	0.23	1.11	0.13	0.23	1.11
Label consumption-Label Valuation	0.20	0.02	9.8	0.63	0.02	9.83	0.47	0.05	7.94	0.47	0.04	7.94
Intrinsic attributes-Product perception (global)	0.47	*	*	0.47	*	*	0.47	*	*	0.47	*	*
Extrinsic attributes-Product perception (global)	0.47	*	*	0.47	*	*	0.47	*	*	0.47	*	*
Guarantee quality L.-Label Valuation (global)	0.95	*	*	0.95	*	*	0.93	*	*	0.93	*	*
External quality L.-Label Valuation (global)	0.71	*	*	0.71	*	*	0.71	*	*	0.71	*	*
Beef confidence-Label Consumption	0.04	0.06	0.34	0.01	0.06	0.40	0.02	0.05	0.40	0.02	0.05	0.39
Breed-Intr.	0.75	*	*	0.75	*	*	0.75	*	*	0.75	*	*
Geographic-Intr.	0.51	0.08	7.5	0.49	0.07	7.50	0.50	0.07	7.50	0.50	0.07	7.50
Animal age-Intr.	0.52	0.08	8.1	0.54	0.08	8.12	0.53	0.08	8.10	0.53	0.08	8.10
Label-Extr.	0.87	*	*	0.95	*	*	0.93	*	*	0.93	*	*
Freshness-Ex	0.10	0.04	1.61	0.10	0.04	1.61	0.10	0.04	1.60	0.10	0.04	1.60

Origin Quali-Extr	0.36	0.06	5.54	0.36	0.06	5.54	0.36	0.06	5.44	0.36	0.06	5.45
More contro-Guar. Label	0.87	*	*	0.86	*	*	0.84	*	*	0.84	*	*
No harmful-Guar. Label	0.69	0.06	11.7	0.61	0.06	11.62	0.66	0.06	11.99	0.66	0.06	11.99
Anim. Feeding-Gu.L	0.84	0.05	14.3	0.72	0.05	14.27	0.78	0.06	14.41	0.78	0.06	14.42
Origin-Ex.L	0.95	*	*	0.97	*	*	0.98	*	*	0.98	*	*
Taste-Ex.L.	0.30	0.05	4.98	0.28	0.05	4.98	0.25	0.05	4.36	0.25	0.05	4.36
Attractive-Ex. Label	0.24	0.05	4.1	0.23	0.05	4.10	0.24	0.05	4.20	0.24	0.05	4.20
Reduction-Confidence	-0.4	0.03	-7.4	-0.38	0.03	-7.40	-0.38	0.03	-7.40	-0.38	0.03	-7.36
Model Fit	χ^2 (202)=820.67 p=0.000 CMIN/DF= 4.07GFI=0.75AGFI=0.69 AIC= 896 BCC=909 RMSEA=0.098						χ^2 (213)=1,082 p=0.000 CMIN/DF= 5.1 GFI=0.68AGFI=0.64 AIC=1137 BCC=1099 RMSEA=0.114					

[a]SRW: Standard Regression Weight; S.E.: Standard Error; C.R.: Critical Ratio

Anex

Table 1A. Samples characterization.

	ITALY	SPAIN
Gender	34.5 %	35.4 %
Male	65.5 %	64.6 %
Female		
Family size (mean)	2.75	3.37
Education level		
High school or less	34.1 %	33.9 %
More than high school	65.9 %	66.1 %
Income		
Modest	47.3 %	17.8 %
Medium	47.3 %	64.2 %
High	5.5 %	17.9 %