Trust in Label Informaiton to Recuperate Consumer's Confidence for Meat: A compared Analysis among Canada, Italy, and Spain

Franco Rosa[1] Mercedes Sánches[2], Ramo Barrena[2]

[1]Veterinary School of Medicine, University of Udine, Via delle Scienze 208, 33100 Udine.
rosa@uniud.it
2 Universidad Pública de Navarra, Pamplona, Spain, mersan@unavarra.es, ramo.barrena@unavarra.es

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Franco Rosa[1], Mercedes Sánchez[2] , Ramo Barrena[2]
[1]Università di Udine, Italy,
[2]Universidad Pública de Navarra, Pamplona, Spain,
rosa@uniud.it, mersan@unavarra.es, ramo.barrena@unavarra.es

Summary

The analysis consisted in a field experiment performed by testing the opinions of different consumers groups: two of them located in the European Regions respectively: Friuli-Venezia-Giulia in Italy and Navarra in Spain; a third one located in the Ontario region, Canada. The data were processed by using a multivariate structural equation in the multi-group version. The enquiry was performed in 2003, just after the news about BSE disease were released in some UE countries, and consisted in a regional survey designed "ad hoc" and submitted by face to face home made interviews, to collect information about consumer habits, opinions and evidences about trust in the food label. By testing the cross-country consumer's behaviours it was allowed to get evidences of the customers confidence (credence quality), with the information diffused by different markets outlets and in different regions. The conclusions were that the market channels released different amount of information about the risk safety specifically: i) at the hypermarket the information were passed to consumers through the product label (objective trait); ii) at the traditional butcher's it prevailed the trust in the vendor that generated the credence quality in the product (psychological trait). These different consumer's attitudes were translated into behavioural attitudes and decisions to buy the beef meat product.

Keywords: *Consumer behaviour, Risk perception, Structural Equation Modeling, Multi-group analysis, food retailer, quality label, beef meat;* **JEL**: M31, Q13

1. Introduction

In browsing the recent economic literature about the consumer behaviour it emerged the importance of information about the food safety to create customer relation.[1] The recent developments in behavioural and information theory integrated the economic determinants: income and price, with psychological traits: emotion, fear, worry, to explain the consumer's reaction related to risk perception. With reference to the market, the trust was assumed to be a priori information framed into perceptions of product safety to substitute the biased market information. The psychology of trust was explained in terms of confidence in someone who had the reputation of reliability and integrity to assure about the product quality. This reputation was build with the contribution of different referential components: individual, family, education, salesperson, and institution, market channel, brand, label with other communication signals. The combination of personal attitudes, belief and social norm, represented a bundle of weighted opinions from various reference groups and contributed to predict the complex, sometimes ambiguous consumer's behaviour. This suggested that the communication strategy was able to generate the feeling of confidence and trust, as a substitute of the inefficient market information (Ajzen and Fishbein). The trust was a trait of the food safety that contributed to generate "ex ante" the consumer's trust in the beef meat product, a trade off between inefficient market information and credence quality. This attitude was used to curb the emotional impact caused by the BSE disease suggesting the decision to be taken in such market contest. (Antonides, 1998, p. 202). The work was based on the following premises: i) the consumers reacted emotionally to the diffusion of alarming news about risk hazards caused mainly by BSE; ii) different beef market outlet as the traditional butcher's shop and the modern super-hypermarket disclosed different amount of information about the food safety, affecting the consumer's decisions; iii) the quality label was a communication strategy able to recuperate the consumer's confidence about the beef meat food; iv) the label was a reliable information affecting the "credence quality" as a substitute for the market information .

2. Methodology: The Structural Equation Model and the Multi-Group Analysis.

Two European Regions respectively: Friuli-Venezia-Giulia in Italy, Navarra in Spain and the region Ontario in Canada were surveyed after the BSE appearance, sporadically signalled in these countries, causing abnormal consumer reactions. The highest negative impacts occurred in UE; probably because at the time of the survey, the presence of BSE in Canada was not yet signalled. The analysis was based on the structural equation model (named SEM, or covariance structure analysis or latent variable analysis), a multivariate technique used to take into account a large amount of relations simultaneously. This technique was considered appropriate when (as it was the case of this research) one dependent variable turned to be independent in the next relationships (Hair et al., 1995). Then the approach combined the multiple regression advantages (examining dependence relationships) with the factor analysis, in a confirmative approach to test the structural theory hypothesized to confirm the degree of behavioural similarities among the groups. The estimation of the multiple interrelated dependent relationships was the main reason to adopt the structural equation model. SEM used the latent variables for the analysis, defined an hypothetical constructs (a latent variable) to be approximated by observable and measurable variable named items (Hair and others, 1999) working as indicators of the unobservable

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1.   In Italy the the bird flu was communicated with "aviarian flu" that encompassed a larger number of volatiles including the domestic poultry and turkey rearings where the hygienic and sanitary conditions are rigidly controlled by the Veterinary service. The economic damages due to demand outbreak were drammatic: 100 billion euro were spent for the first emergency intervention and it was estimated the 50% of demand fall in consumption only in Italy. A consistent quota of the poultry product was exported successfully to demonstrate that the consumer attitudes changed across the EU countries and are related to cultural backgrounds.

latent ones. The condition was there was a causal nexus between the latent variables and the set of observable indicator variables, and the measure implied an error with known distribution.

In standard notation the structural relation was the following (1):

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

where η represented the vector of dependent latent variables, B was the matrix of coefficients relating the dependent or endogenous latent variables one to each other, ξ was the vector of latent independent variables related to η by the matrix of coefficients Γ, and ζ was the vector of errors for the above equation.

Since the η latent variables were unobserved, the indicators were used to measure them. The structural equation model was associated with two measurement models taking into account the errors in the measurement of the variables η and ξ. The first one was given by equation (2):

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

x was the vector of indicators of the latent exogenous (independent) variables ξ; Λ_x was the matrix of factor loadings or structural coefficients between the exogenous latent variables and the x indicators; and δ was the measurement error. The second measurement equation was (3):

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

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

When the data were collected to perform a multiple group analysis, it was used the same path diagram for the all groups used to test the hypothesis whether the parameter values were invariant across the groups. The acceptance of this hypothesis meant similar structural consumers' behaviours across the countries. Also the variances, invariances and regression weights were considered in the analysis (Arbuckle and Wothke, 2003).

With such a large number of cross-group constraints, it was needed to use a strategy to decide the constraints among the groups to be used and the order in which they should be tested (Arbuckle and Wothke, 2003). The software AMOS 5.0 software estimated four models respectively: i)unconstrained model, ii) measurement weights model, iii) structural covariance model, iv) measurement residuals model. Many authors discussed the problems with these estimates: Ansari et al, (2000); Steenkamp and Baumgartner, (1998); Lindquist et al, (2001); Ritchey et al. (2003). With these parameters estimates it was interesting to test the model fit by using alternative statistical tests: p-value, AGFI and RMSEA were selected for the purpose.

The quality attributes perceived by the consumers in term of risk and their relation with the product label were selected from the marketing literature. These were tested in the cross-compared analysis including three regions and two retailer outlets: traditional butcher's shop and supermarket. There was a broad consensus about the multidimensional risky constructs (Andersen, 1994, Bello and Calvo, 2000, Caswell, 2001, Grunert, 1997 and others).

The causal model was framed with two latent variables: the first one was called the latent exogenous variable (ξ_1) representing the product quality causally related to two groups of indicators respectively:

i) the 'intrinsic attributes' indicators: geographical origin X_1, breed X_2 and animal age X_3; ii) the 'extrinsic attributes' indicators: price X_4, quality label X_5, freshness X_6. The perceptions of these attribute were evaluated using a a five-point Likert scale: the value five represented the maximum level of agreement and one the lowest one[1]. The second latent variable, was representing the consumer's attitude to trust in the beef meat safety named the label appreciation. Two groups of indicators were used (Shroeder, 2003): i) the first represented the 'guarantee quality label ' performed with meat control X_7, no harmful guarantee X_8, higher quality X_9, and less risky product X_{10}; ii) the 'external guarantee of the label' was assumed to be dependent on the geographic indication of the product origin perceived through the following indicators: geographic indication X_{11}; flavour or taste X_{12}; attractiveness X_{13}.

2.1 Survey design and sample data collection

The data were collected during the period 2002 and 2003 in a consumer surveys submitted to consumers groups randomly selected in these three regions: Friuli-Venezia-Giulia (Italy), Navarra (Spain) and Ontario (Canada). This selection was suggested by the following reasons: first, these regions were representative of broader consumption areas: Ontario showed the highest production and consumption values, followed by Italy and Spain; in addition Canada ranked seventh in the world meat production, while Italy and Spain covered respectively the 15% and the 9% of the total EU consumption. Navarra was an important beef production area whose quality was supported by a geographic origin label (PGI Ternera de Navarra) related to the adoption of a semi-extensive grazing that was able to increase the commercial value of the meat. This label was estimated to cover the 50% of the total beef consumption in Spain (Beriáin, 2002) and beef meat consumption was a traditional diet habit. The beef consumption value in Italy was over the EU average while in Spain was a little below the average; the gap between the two countries was indeed very narrow. Third the consumer's habits and the socio-demographic profiles were likely in Spain and Italy and not greatly different when compared with Canada. Finally, the food scares spread over these countries causing different consumer's reactions.

The data, collected from these three regions surveyed, were randomly stratified, using the neighborhood and age variables. Two hundred fifty people were interviewed in Spain; one hundred twenty five in Canada and one hundred fifty in Italy. The selected respondents were habitual consumers and purchasers of meat food products prepared and eaten at home. The first question of the questionnaire was whether the interviewed usually ate their meat product prepared at home. When the answer was negative the   interview was finished. Hence, only non-vegetarian consumers were considered, however this decision didn't cause any significant bias for the results because in the three regions the number of vegetarian consumers was not significantly different.

The questions in the first part of the questionnaire were addressed to go deeper insight into fresh meat consumption patterns; consumer's were asked to indicate: i) the frequency they ate different meat products (beef, chicken, pork and lamb, ii) the average weekly beef meat consumption, iii) the perceptions of beef meat attributes, iv) the eventual reduction of beef meat consumption after BSE[2], v)

1.   For those who are interested the complete questionnaire used for this survey is available in three languages.

the motivation to reduce the consumption and/or substitution with other types of meats, vi) the self-confidence in the beef quality evaluation; vii) the importance of the beef label information for quality judgement. Finally, the respondents were invited to give their socio-demographic and lifestyle profile. In this sense, one of the more important differences observed in consumers behavior in the two European regions was the impact and reaction to the BSE crisis specifically suggested by the sharp decline in meat beef consumption followed by a recovery. In Italy, the number of consumers who diminished the beef meat in the diet was estimated to be the 33%, more than in Spain (23%), though in Spain the number of BSE cases was higher: 154 cases in Spain, 59 cases in Italy. This seems to be related with the demand of quality label beef meat: 51% in Italy versus 85% in Spain.

3. Discussion of results

The first relevant result was the buyers attitude in function of the marketing outlet represented by traditional buyer's shop (Butcher) and super-hypermarket. The meat consumption share were : Canada 42%, Italy 47% and Spain 68%. With respect to the differences of the consumers profiles, these were not so relevant with the exception for the consumer age. So that, the preference for the traditional retailer's outlet was expressed by more aged buyers and in Spain with income higher than the average.

 About the beef consumption at different market outlets: the Canadian market showed the highest beef consumption followed by Italy and Spain with similar levels. The frequency of consumption was higher in Canada and the reduction in beef consumption after BSE was more evident in Italy compared with Spain, this last one showed the largest consumption of the beef quality label amongst the regions examined. There were not relevant differences across the retailers: the inverse relation between price and consumption was respected in the all marketing outlets. Additionally, the Italian consumers, purchasing at the supermarket, were less interested to the quality label, the opposite was for the Spanish consumers preferring the more traditional butcher's shopping. For the confidence on different meats was implemented by the tracking and tracing procedures implemented in European countries after the safety regulation introduced beginning with 2005. The results showed higher consumer's confidence of the beef meat in the all market channels, especially in Canada and Spain regions; in Italy the customer preferences were for the supermarket. The traceability system contributes especially higher security and higher information to the consumers in the two European countries. In Italy the confidence of less traditional retailer option is major, as we explained in other results.

[c] increase of the beef consumption if a higher security level was perceived. In Italy the values were expressed in percentage; in Canada and Spain the values reported the weekly consumption in Kg.
n.a.: not available

Additionally the main beef attributes evaluated at the moment of purchasing were: I) meat freshness appreciated in all these countries; ii) indication of the origin with the label reported on the package, that was highly appreciated in Canada. The label reporting the origin of the product was considered the most important attribute when the purchase was made at the traditional market outlet in Canada and Spain while the price was the most important at the supermarket channel in Canada and Spain; however, the consumer behaviour was quite similar among the observed countries.

The consequences of the quality label were examined with the data reported in the mean values suggested that across the countries, the introduction of the monitoring and control system described in the label which introduction was regulated by the UE indicated that the quality value perception

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2.   These questions had been formulated in the European countries because at the moment of the study there aren't BSE cases in Canada (April 2003, in this country the first case was detected in May of 2003).

increased in these countries and was related to a better taste perception. The consumption level was higher in Spain.

3.1 Structural analysis: SEM and multi-group analysis

To compare the results obtained in these countries the Structural Equation Model was estimated in the Multi-Group version to give evidence of the structural differences among the countries by using latent variables. Below is reported the graphic representation of the SEM where the two latent endogenous variables namely intrinsic attributes and extrinsic attributes are caused by product perception and the other two two latent endogenous variables , guarantee quality label and external guarantee label aspects are caused by label valuation.
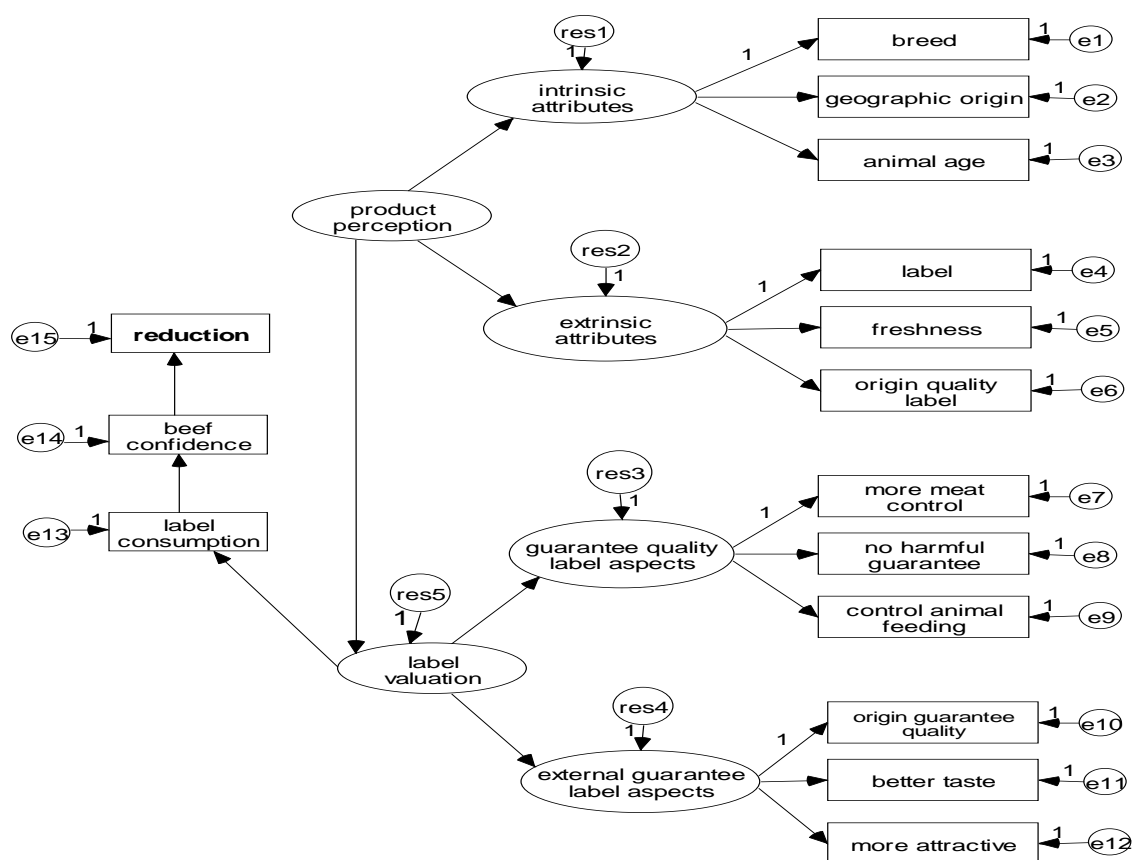
Figure 1. The causal model of the reduction in beef consumption

In Table 1 there were reported the results about the intrinsic attributes of beef in different countries and retailers' options. The results showed the importance of the origin and animal age for traditional customers and the higher importance of the beef breed for the modern consumers. These values were similar across the countries, especially in the case of supermarket channel. The multi-group comparison with p-values and other fit measures confirmed these behavioural similarities (p-values: unconstrained model 0.254, measurement weights 0.070, structural covariances 0.129). For this latent variable the

differences concerned the butcher's shop buyers especially between Canada and Spain in regard of the evaluation of the animal origin.

Table 1. SEM - Multi-Group procedure results for beef intrinsic attributes appreciated to traditional and super-hypermarket buyer

	Butcher's shop				Super-Hypermarket		
	Canada	Italy	Spain		Canada	Italy	Spain
Origin (a)	0.700 (*)	0.685 (*)	0.900 (*)		0.566 (*)	0.622 (*)	0.530 (*)
Breed (a)	0.316 (1.552)	0.707 (3.95)	0.492 (1.13)		0.810 (2.134)	0.601 (2.59)	0.642 (3.136)
Animal Age (a)	0.590 (2.531)	0.538 (3.42)	0.534 (1.10)		0.079 (0.502)	0.368 (2.001)	0.650 (3.132)
SEM MG Procedure	MG - 3* countries	MG C-I	MG C-S	MG I-S	MG- 3 countries		
Unconstrained Model							
P-value	0.068	0.699	0.028	0.04	0.254		
AGFI	0.895	0.973	0.867	0.89	0.910		
RMSEA	0.070	0.000	0.110	0.09	0.043		
Measurement Weights							
P-value	0.075	0.514	0.024	0.05	0.070		
AGFI	0.921	0.938	0.898	0.92	0.892		
RMSEA	0.055	0.000	0.092	0.07	0.066		
Structural Covariances							
P-value	0.001	0.591	0.005	0.00	0.129		
AGFI	0.870	0.947	0.869	0.84	0.914		
RMSEA	0.087	0.000	0.106	0.12	0.052		
Measurement Residuals							
P-value	0.005	0.694	0.902	0.00	0.022		
AGFI	0.906	0.950	0.902	0.88	0.902		
RMSEA	0.068	0.000	0.0806	0.10	0.069		

[a] Standard Regression Weight values of the parameters; in parenthesis is the Critical Ratio in the Unconstrained Model.

* SEM MG: SEM Multi-Group procedure. C-I, Canada-Italy, C-S, Canada-Spain, I-S, Italy-Spain. Only was estimated the couple comparison if the three model was not equal.

In table 2 were reported the results for the extrinsic attributes; these suggested that the buyers' behavior at supermarkets were very likely across the countries: the label was the attribute that mostly affected the consumer's behavior.

For the traditional channel the behavioral models showed more differences and the label represented the more important attribute in affecting the decisions.

Table 2. SEM - Multi-Group procedure results for beef extrinsic attributes appreciated to traditional and super-hypermarket buyer

	Butcher's shop			Super-Hypermarket		
	Canada	Italy	Spain	Canada	Italy	Spain

Price (a)	0.27	0.18	0.14		0.285	0.07	0.02
	(*)	(*)	(*)		(*)	(*)	(*)
Label (a)	0.77	0.666	0.497		0.777	0.62	0.65
	(1.40)	(1.01)	(0.90)		(1.69)	(0.34)	(0.11)
Freshness (a)	0.37	0.377	0.12		0.18	0.12	0.19
	(1.15)	(0.92	(0.59)		(0.94)	(0.29)	(12.57)

SEM MG Procedure	MG - 3* countries	MG C-I	MG C-S	MG I-S	MG 3 countries
Unconstrained Model					
P-value	0.001	0.000	0.000	0.00	0.02
AGFI	0.852	0.657	0.617	0.68	0.867
RMSEA	0.113	0.216	0.224	0.20	0.101
Measurement Weights					
P-value	0.016	0.003	0.000	0.00	0.084
AGFI	0.924	0.794	0.764	0.80	0.922
RMSEA	0.070	0.156	0.173	0.16	0.061
Structural Covariances					
P-value	0.001	0.003	0.000	0.00	0.051
AGFI	0.889	0.809	0.716	0.81	0.908
RMSEA	0.084	0.146	0.179	0.15	0.064
Measurement Residuals					
P-value	0.002	0.005	0.000	0.00	0.082
AGFI	0.902	0.829	0.746	0.84	0.917
RMSEA	0.074	0.133	0.165	0.13	0.055

[a]   Standard Regression Weight values of the parameters; in parenthesis are reported the Critical Ratio in the Unconstrained Model.

* MG: SEM Multi-Group procedure. C-I Canada-Italy, C-S Canada-Spain, I-S Italy-Spain. Only was estimated the couple comparison if the three model was not equal.

The results about the control measures described in the quality label suggested different levels of appreciation across the countries when compared to other constructs. For the traditional buyers the behavioural differences were more similar and were confirmed by the structure of the cross-covariances among the countries.

The quality and the risk alert were important for the Canadian and Spanish consumers. By observing the super or hyper-market customers the most appreciated attributes were the controls that contributed to assure the consumer against the meat risk perception. However this channel didn't show a similar structure of the construct in the cross- country analysis.

Table 3. SEM Multi-Group results for the control aspects of quality labels to traditional and super-hypermarket buyer

	Butcher's shop			Super-Hypermarket		
	Canada	Italy	Spain	Canada	Italy	Spain

	MG 3 countries*	MG C-I	MG C-S	MG I-S	MG 3 countries	MG C-I	MG C-S	MG I-S
More Meat Control (a)	0.597 (n.a)	0.689 (n.a)	0.512 (n.a)		0.646 (n.a)	0.781 (n.a)	0.669 (n.a)	
Not Harmful (a)	0.747 (3.53)	0.632 (3.93)	0.469 (4.18)		0.775 (4.75)	0.553 (3.47)	0.585 (3.93)	
More Quality (a)	0.737 (3.49)	0.584 (3.69)	0.444 (4.03)		0.771 (4.73)	0.524 (3.31)	0.534 (3.65)	
Less risk product (a)	0.756 (3.56)	0.572 (3.43)	0.760 (4.29)		0.794) (4.84)	0.592 (3.41)	0.655 (3.86)	
Unconstrained Model								
P-value	0.000	0.002	0.02	0.09	0.000	0.000	0.012	0.02
AGFI	0.662	0.734	0.914	0.93	0.700	0.691	0.842	0.86
RMSEA	0.160	0.159	0.090	0.06	0.150	0.177	0.118	0.10
Measurement Weights								
P-value	0.000	0.007	0.086	0.09	0.000	0.000	0.033	0.08
AGFI	0.754	0.816	0.946	0.94	0.789	0.760	0.882	0.90
RMSEA	0.131	0.124	0.059	0.05	0.119	0.146	0.089	0.07
Structural Covariances								
P-value	0.000	0.003	0.000	0.02	0.000	0.000	0.001	0.11
AGFI	0.726	0.800	0.833	0.91	0.748	0.700	0.816	0.91
RMSEA	0.134	0.127	0.109	0.07	0.127	0.171	0.125	0.06
Measurement Residuals								
P-value	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.00
AGFI	0.693	0.745	0.781	0.91	0.735	0.671	0.797	0.87
RMSEA	0.138	0.149	0.125	0.08	0.132	0.191	0.136	0.10

[a] Standard Regression Weight values of the parameters; in parenthesis are reported the Critical Ratio in the Unconstrained Model.

* MG: SEM Multi-Group procedure. C-I Canada-Italy, C-S Canada-Spain, I-S Italy-Spain.

Finally, the beef meat with quality label was appreciated by Italian and Spanish consumers in the supermarket while the traditional consumers showed relevant differences in the appreciation of taste and attractiveness. Results were reported in table 4

Table 4. SEM Multi-Group results for attributes perceived from the quality labels to traditional and super-hypermarket buyer

	Butcher's shop				Super-Hypermarket		
	Canada	Italy	Spain		Canada	Italy	Spain

	MG - 3 countries	MG C-I	MG C-S	MG I-S	MG - 3 countries	MG C-I	MG C-S	MG I-S
Origin (a)	0.257 (*)	0.354 (*)	0.184 (*)		0.614 (*)	0.323 (*)	0.687 (*)	
Better Taste (a)	0.656 (1.00)	0.975 (2.87)	0.478 (2.87)		0.213 (1.23)	0.935 (2.1)	0.054 (0.383)	
More Attractiveness (a)	0.576 (1.25)	0.685 (3.03)	0.423 (3.03)		0.732 (3.28)	0.613 (2.29)	0.679 (3.56)	
SEM Multi-Group Procedure	MG - 3 countries	MG C-I	MG C-S	MG I-S	MG - 3 countries	MG C-I	MG C-S	MG I-S
Unconstrained Model								
P-value	0.016	0.036	0.001	0.01	0.127	0.108	0.206	0.15
AGFI	0.858	0.853	0.863	0.85	0.891	0.858	0.909	0.90
RMSEA	0.093	0.120	0.127	0.12	0.067	0.102	0.065	0.08
Measurement Weights								
P-value	0.000	0.002	0.000	0.00	0.002	0.010	0.400	0.000
AGFI	0.746	0.745	0.864	0.75	0.837	0.804	0.944	0.756
RMSEA	0.148	0.154	0.128	0.17	0.107	0.137	0.009	0.170
Structural Covariances								
P-value	0.000	0.000	0.000	0.00	0.005	0.022	0.505	0.001
AGFI	0.788	0.708	0.889	0.78	0.870	0.837	0.952	0.804
RMSEA	0.143	0.191	0.116	0.17	0.091	0.117	0.000	0.147
Measurement Residuals								
P-value	0.000	0.000	0.000	0.00	0.000	0.000	0.344	0.001
AGFI	0.831	0.631	0.882	0.85	0.881	0.782	0.934	0.852
RMSEA	0.126	0.231	0.117	0.15	0.097	0.169	0.030	0.139

[a] These values are the Standard Regression Weight of the parameters; in parenthesis are reported the Critical Ratio in the Unconstrained Model.
* MG: SEM Multi-Group procedure. C-I Canada-Italy, C-S Canada-Spain, I-S Italy-Spain.

4. Concluding remarks.

In this paper it was investigated the role of different attributes to affect the consumer's loss of confidence in beef meat for risk perception of BSE. The attributes were the presence of the quality label in the product and the relevance of the selection of the different retailer in the acquisition process. The experiment was based on a cross comparison of consumer behaviours regarding the beef meat quality in three different countries: Canada, Italy and Spain where different socio-cultural and market environments offered the opportunity to compare consumer's reactions to marketing information. Specific topic was to test the perception of potential risk related to beef meat consumption as a consequence of the release of biased information about the BSE threat. Observable facts were the short-run dramatic fall in meat consumption and a slow recuperation in the long run. The results gave enough evidence that the beef meat consumption was dependent on perceptions of quality attributes and affected by market communication strategies addressed to reassure the consumer about product safety. The quality labels related to geographic origin were quite effective (particularly in Spain) to recuperate the consumer's confidence and the beef meat consumption.

Another evidence was the consumer behaviours across the countries were quite likely at the super-hypermarket outlets suggesting the consumers' homologation across the countries when they purchase at supermarket; instead there are more behavioural differences at the traditional butcher outlet that could be explained with the influence of psycho-demographic variables affecting the perceptions of quality in traditional market environment where the relations between seller and buyer still play a relevant role in consumers' decisions. It would be interesting for the future to analyse these changes

affecting the domestic market environment to modulate production and marketing-mix strategies to improve the quality function deployment and consumer satisfaction.

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Appendix 1

Table 5. 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					
	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	0.193	0.325	0.923	0.178	0.29	1.28	0.18	0.31	0.87	0.100	0.33	0.66
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
Intrinsic attributes-Product perception (global)	0.648	*	*	0.436	*	*	0.559	*	*	0.418	*	*
Extrinsic attributes-Product perception (global)	0.548	*	*	0.436	*	*	0.559	*	*	0.418	*	*
Guarantee quality L.-Label Valuation (global)	0.906	*	*	1.155	*	*	0.861	*	*	0.971	*	*
External quality L.-Label Valuation (global)	0.714	*	*	0.713	*	*	0.713	*	*	0.709	*	*
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
Breed-Intr.	0.767	*	*	0.743	*	*	0.77	*	*	0.740	*	*
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
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
Label-Extr.	0.858	*	*	0.939	*	*	0.89	*	*	0.927	*	*
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
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
More contro-Guar. Label	0.870	*	*	0.801	*	*	0.89	*	*	0.847	*	*
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
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
Origin-Ex.L	0.801	*	*	0.796	*	*	0.99	*	*	0.958	*	*
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

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