Consumer Interest in Meat Labelled Attributes: Who Cares?

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Abstract

The aim of the study is to better understand consumer attitudes about meat origin, cattle breeding and feeding systems. We analysed the determinants that lead consumers to use labelled information contained on fresh beef and processed beef products. Information was gathered by telephone using a questionnaire survey conducted in the northern Italy. The survey sampled nearly 1000 consumers. Four binary logit models were used to investigate consumers' use of specific labelled information using a set of variables to identify the primary determinants. Results showed that the use of different types of labelled meat-information is affected by the variables related to socio-demographics, product quality, safety perception, and consumer food knowledge.

Keywords: labelled information, meat, consumer economic analysis, logit analysis, Italy

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Introduction

Overall, meat consumption per capita has increased globally (FAO 2014). Economic and population growth in developing countries have greatly contributed to this positive trend. Rising incomes have helped alleviate protein deficiencies while providing nutritional and dietary upgrades (Fayaz Bhat and Fayaz 2011). In contrast, consumers in developed countries are not expected to contribute positively to increases in animal protein consumption in the future. A slight decline suggests saturation has occurred and meat consumption has peaked in many markets (Pethick et al. 2010). Specifically, changes in meat prices, growth of aging populations, and health and dietary awareness may explain a substitution dynamic occurring in developed markets between red and white meat consumption (Henchion et al. 2014; Aepli and Finger, 2013). In the last half century, chicken prices have decreased due to technology advances and changing consumer preferences for lighter diets leading to increases in white meat intake, while red meat consumption is observing a negative per capita trend (Kayser et al. 2013).

Within this context, the quality of red meat is becoming more important than price in determining food choices (Verbeke et al. 2010; Banterle et al. 2011). The meat industry faces challenges to fully understand how consumers form their quality opinions about red meat and which attributes positively affect consumer preferences so that they may develop effective differentiation strategies (Bansback 2014). Current literature shows that consumers are also interested in intrinsic quality meat attributes such as animal welfare, production systems, and animal origin (Realini et al. 2013,Vanhonacker et al. 2013, Schnettler et al. 2009).

Within the European normative framework on meat labelling, more attention is being paid to meat quality attributes. Regulation 1760/2000 introduced the possibility to adopt voluntary labelled information concerning specific attributes of beef products such the type of cattle breeding, animal feeding, etc., providing traceability systems aimed at guaranteeing the supply chain transparency and the truthfulness of labelled information. New Regulation 653/2014 has amended the previous regulation in order to simplify the management of the voluntary labelled information by reducing the costs of adoption and control of voluntary traceability system. Moreover, the new rules stipulate that the voluntary labelled information must be in line with Regulation 1169/2011 regarding the horizontal legislation on labelling. Information must be objective, verifiable by the relevant authorities, and understood by consumers. In Italy, the national legislation (January the 16th, 2015) has implemented the new European Regulation specifying, in accordance with previous rules, that the voluntary information can refer to the animal characteristics (breed or genetic type, information about animal welfare, etc.), farming (breeding system, the food ration, therapeutic treatments, cattle feeding) and slaughtering.

This new legislation focuses on consumers' changing needs for information and their interest in information disclosure in order to make appropriate food choices. However, a large body of literature has stressed the difference between the importance consumers place on the information contained on meat labels and the use of such information. Many food labels receive only limited attention (Drichoutis et al. 2005, Rawson et al. 2008) and consideration when consumers make food choices (Grunert and Wills 2007, Möser et al. 2010). Current research also finds that consumers face some barriers when using labelled information (Bialkova et al. 2013, Graham et al. 2012, Grunert et al. 2010).

This study aims to understand the factors that lead consumers to seek certain types of labelled information about fresh beef and fresh processed beef products.

The analysis used a telephone questionnaire containing a multiple-choice format with a dichotomous (1 to 5 rating) scale. The sample was composed by nearly 1,000 consumers living in Northern Italy. Four binary logit models where used to estimate and investigate how consumers use specific information contained on labelled fresh meat using a set of variables to identify the main determinants. These include: socio-demographic characteristics, food quality attributes, consumer healthy life attitude, consumer nutritional knowledge and source of information most used, and consumer food safety attitudes.

The paper is organized as follows: (1) the next section provides an overview of economic literature analysing meat consumers' interest in labelled information; (2) followed by the empirical model, survey, sample and variables. (3) Results and findings are then presented; (4) leading to concluding remarks and managerial implications in the final section.

Background: Meat Labelling and Consumer Attitude

Market inefficiencies linked to credence attributes in food products have led regulatory authorities to use product labelling as an important means towards improving consumer communication regarding information contained in food products (Caswell and Modjuska 1996, Banterle et al. 2013, Fernqvist and Ekelund 2014). Likewise in the meat sector, different credence attributes are search cues contained on package labelling that allow consumers to know more about the intrinsic characteristics of meat products.

Among the European normative framework on labelling, the intrinsic quality attributes in meat production include the origin of meat, the systems of cattle breeding, and the systems of cattle feeding.

In Europe, the labelling of beef origin is mandatory and refers mainly to Regulation 1760/2000, Regulation 1169/2011, and Regulation 653/2014. Most of the studies have demonstrated clear interest from consumers in obtaining such information (Realini et al. 2013, Imami et al. 2011, Schnettler et al. 2009, Loureiro and Umberger 2007, Verbeke and Ward 2006, Bernués et al. 2003, Roosen et al. 2003).

Labelled information on systems of cattle breeding and feeding have been recently regulated at a European level (Regulation 653/2014), national level, and through private standards. In Italy examples of private standards include terms such as: *pasture-raised*, *organic production* and *livestock sustainable production*. Napolitano et al. (2007) found that animal welfare information about breeding conditions has had a positive effect on meat acceptability. Other authors note consumer interest in organic production and the role related labelled information has in increasing consumers' preference (Napolitano et al. 2010, Janssen and Hamm 2012, Fernqvist and Ekelund 2014).

Information on cattle feeding refers mainly to traceability labels in Italy. Such voluntary information approved by European regulation refers to the absence of animal fat, genetically

modified organisms (GMOs), or antibiotics in animal feeding. The literature stresses consumers' interest in the quality attributes reported above. Maiorano et al. (2010) analyzed labelled information related to feeding systems and consumers' expectations and acceptability of meat. Realini et al. (2013) examined labelled information about the finishing diet (grass, grass plus concentrate, concentrate) of cattle and the impact on consumers' beef choices. Other authors have surveyed consumers' preferences on different GM labelling policies and the presence or absence of GM ingredients in cattle feed (Crespi and Marette 2003, Loureiro and Hine 2004, Lusk et al. 2004, Hu et al. 2005).

Although meat labelling captures consumer interest, a large body of literature has stressed a discrepancy between the importance given to the information on labels and the effective use of such information (Dranove et al. 2003, Verbeke 2005). Many labels on foods often receive only limited attention and consideration when consumers make food choices (Grunert and Wills 2007, Möser et al. 2010).

Current research shows that consumers face some barriers when navigating through labelled information, which can be linked both to their bounded rationality and other external factors. Bounded rationality refers to the cognitive limitations of the mind, the time available to make the decision, and the quantity of information available regarding the food choice. More precisely, many authors stressed a positive relationship between the level of consumer food knowledge and label usage (Grunert and Wills 2007, Grunert et al. 2010). Time constraint influences the use of food labels negatively (Rawson et al. 2008). Moreover, many authors found too much information runs a risk of information overload, leading to confusion or a lack of interest (Salaün and Flores 2001, Verbeke 2005). This problem can be connected to the 'rationally ignorant consumer hypothesis' in which consumers do not consider all the information available on food products, even though such information is free. This is because the opportunity costs of acquiring all the provided information would be too high (McCluskey and Swinnen 2004).

Recent literature has also examined the role of some external factors, like label characteristics (label size, color, format etc.) on consumer label use (Graham et al. 2012). Labels often differ in terms of 'visual clutter', i.e. size (the dimensions of labels and the amount of information contained on them), proximity (the spatial distribution of labelled information), and congruency (color, shape, semantic category) (Bialkova et al. 2013, Hodgkins et al.2012, Mata et al. 2011, Henderson et al. 2011).

Meat label information in Italy related to cattle breeding systems is characterized by size and congruency. Big labels and bright colors are commonly used to inform consumers about organic or sustainable production. While information concerning animal origin and feeding conditions are available on meat traceability labels, which provides a considerable amount of detailed information in small print with no label coloring.

The aim of the study is to better understand consumers' attitudes towards meat origin, systems of cattle breeding, and feeding. Specifically, we analysed the determinants that lead consumers to use the different kinds of labelled information on meat products. With regard to the literature we can summarize variable categories affecting consumer use of food labelled information as follows: socio-demographic and individual characteristics, attitude towards food quality, healthy

life style choices, food knowledge and source of information, and food safety attitudes (Drichoutis et al. 2005, Stranieri et al. 2010).

The first category includes variables such as gender, education, age, income, and body mass index. Regarding gender and education, different studies pointed out that women with higher education levels are more likely to use labelled information (Nayga 1996, Behrens et al. 2007). Aging consumers seem to be less prone using food label information. Younger people are more likely to read food labels; even though older respondents perceive risk reducing strategies (including label use) to be more useful than younger consumers (Todd and Variyam 2008, Bayarri et al. 2010).

Regarding quality attributes, the literature highlights some extrinsic and intrinsic cues affecting label usage, including: price, ingredients, certifications, product freshness, and expiry date (Botonaki and Mattas 2010, Tsakiridou et al. 2008).

Examining food labelling related to healthy life attitudes, several studies found a positive link between the use of information on food labels and a high perception of a diet's healthfulness (Nayga 1996, Weaver and Finke 2003). Moreover, Kim et al. (2000) demonstrated a positive relationship between food knowledge and label use. However, Grunert at al. (2010) showed that the use of labelled information is mainly related to an interest in healthy eating, whereas the understanding of it is connected to consumer food knowledge. Finally, the relationship between food label use and consumers' attitudes toward food safety concerns is significant and positive (Kennedy et al. 2008, Bernues et al. 2003).

Methodology

The survey was conducted in the Lombardy region of northern Italy in 2007. The type of voluntary labelled meat attributes refer to those allowed by Regulation 1760/2000, which are currently reconfirmed by Regulation 653/2014 and by the Italian law (January 2015). Data were obtained from telephone interviews utilizing a questionnaire. Consumer responses totaled 1,025. Respondents were over 18 years old and residents of Lombardy, which corresponded to a sampling fraction of 0.1‰. The sample was stratified taking into consideration the regional share of gender, age, town, and province of residence (home ownership). It was representative of the Lombardy population. Due to missing values, the sample used for the estimations consisted of 999 consumers.

The response rate was 10.4% (the total number of contacts was 9,887). A previous pilot survey was conducted to test the questionnaire in order to maximize the response rate and minimize the error rate. The questions were arranged in a multiple-choice answer format with rating scales. Table 1 shows the demographic profile of consumers who responded to the questions about the use of meat labelling.

We can assume the following functional relationship among the groups of variables:

$$(1-4) \quad MI_{vi} = f(Sd_{vg}, Qa_{vh}, Hl_{vr}, Ks_{vs}, Fs_{vz}, e_{vi})$$

where:

$i = 1, ..., 999; v = 1, ..., 4; g = 1, ..., 6; h = 1, ..., 8; r = 1, ..., 3; s = 1, ..., 4; z = 1, ..., 3.$

The four equations (1-4) explain the use of the meat label and specific labelled information. MI_{vi} are binary variables (0 if the label or the single information is not used, 1 if consumers use the label) connected to (Table 2):

      a. MI_{1i} – Meat label use;
      b. MI_{2i} – Information on country of animal origin;
      c. MI_{3i} – Information concerning the system of cattle breeding;
      d. MI_{4i} – Information concerning the system of cattle feeding.

MI_{1i} consists of 999 consumers. The models MI_{2i-4i} are subsets of M_{1i} and consider 710 consumers who read meat labels. 41% of them check for all information related to traceability. Concerning MI_{2i} only the 18% of those interviewed do not read information concerning origin. The high number of consumers who read the product origin confirms the great interest towards such information. In MI_{3i}, 41% of the consumers do not check for information regarding the system of cattle breeding. In $MI_{4i,}$ 33% of the consumers do not read information related to feeding, whereas the 67% do check for it.

Table 1. Profile of Consumers of the Survey

Demographic and Personal Characteristics	Number	Percent
Gender		
M	501	48.9
F	524	51.1
Age		
18-24	71	6.9
25-34	124	12.1
35-44	211	20.6
45-54	190	18.5
55-64	186	18.1
>64	243	23.7
Educational Level		
Primary School	163	15.9
Middle School	346	33.8
High School	399	38.9
College graduate and post graduate	117	11.4
*Income Level**		
Only with sacrifices (low)	181	17.7
Yes, but paying attention to expenders (medium)	501	48.9
Yes (high)	140	13.7
Yes, without problems (very high)	203	19.8

Note. * The capacity to cope with food shopping

Table 2. The Dependent Variables

Dependent Variables	Variable Description	Scale	N	Mean
Meat label use (MI_1)	Respondent checks the meat label. Yes=1; No=0.	0-1	1,025	0.75
Country of origin (MI_2)	Respondent checks the meat origin. Yes=1; No=0.	0-1	710	0.82
System of cattle breeding (MI_3)	Respondent checks the information labelled concerning the cattle breeding system. Yes=1; No=0.	0-1	710	0.59
Cattle feeding (MI4)	Respondent checks the information labelled concerning the system of cattle feeding. Yes=1; No=0.	0-1	710	0.67

The independent variables are 24 and they were grouped in the following five sets of variables (Table 3).

Sd_g, where $g=1$, …6, represents variables related to socio-demographic and individual characteristics of the consumers, i.e. age (scale from 1 to 6), gender (dichotomous scale), income (scale from 1 to 4), education (scale from 1 to 4), being shopper (dichotomous scale), and BMI (scale from 1 to 5).

Qa_h, where $h=1$, ...8, represents variables related to quality attributes of food products, i.e. the importance of price, origin of products, traceability, quality certifications (all measured by a scale from 1 to 5), product freshness, nutritional properties, ingredients, and best by date (all measured by a dichotomous scale).

Hl_r, where $r=1$, ...3, represents variables connected to healthy life attitude, and it includes three variables, i.e. dietary habits (scale from 1 to 5), sports habits, and smoking status (dichotomous scale).

Ks_s, where $s=1$, ...4, represents variables related to food knowledge and source of information. A scale from 1 to 5 is used to measure the variable food knowledge, where '1' stands for 'uninformed consumer' and '5' refers to 'very informed consumer'. This variable was created through an index obtained by four questions on items concerning cholesterol, fats, sugar and vitamins. We attributed '1' for all wrong answers and '5' for all four right answers. The variables related to the source of food information considered the different typologies consumers usually use to capture food information. These included: media (TV, radio, newspaper), experts (doctors, health authorities), and relatives or friends. These variables are expressed by a dichotomous scale.

Fs_z, where $z=1$, ...3, represents variables connected to food safety attitude, i.e. attention to food safety issues (scale from 1 to 5), the level of food safety perceived by consumers (scale from 1 to 5), and meat consumption variation after the BSE crisis (scale from 1 to 3).

Table 3. The Independent Variables

Independent Variables	Variable Description	Scale	N	Mean	S.D.
Socio-demographic and individual characteristics (Sd $_g$)					
Age	Respondent is 18-24 years old=1; 25-34 years old=2; 35-44 years old=3; 45-54 years old=4; 55-64 years old=5; >64 years old=6	1-6	1,025	4.00	1.56
Gender	Male=1; Female=2	1-2	1,025	1.51	-
Income	Is the monthly household income enough? Only with a lot of sacrifices=1; yes, but paying attention to expenditures=2; yes=3; yes, without problems=4	1-4	1,016	2.34	0.98
Education	Which is your degree? Elementary school-leaving certificate=1; Respondent has 8 years of obligatory education=2; High school education=3; University education or higher=4	1-4	1,025	2.46	0.89
Being shopper	Is the respondent the main food shopper? Yes=1; No=2	1-2	1,025	1.29	-
BMI	Five categories of Body Mass Index from underweight to obesity	1-5	999	2.99	1.41
Quality attributes (Qa $_h$)					
Price	Rating of importance of price on purchasing decision (from strongly disagree=1 to strongly agree=5)	1-5	1,023	3.75	1.10
Origin	Rating of importance of origin on purchasing decision (from strongly disagree=1 to strongly agree=5)	1-5	1,024	4.16	1.14
Traceability	Rating of importance of traceability on purchasing decision (from strongly disagree=1 to strongly agree=5)	1-5	1,022	4.29	1.05
Certification	Rating of importance of certification on purchasing decision (from strongly disagree=1 to strongly agree=5)	1-5	1,015	4.29	1.01
Freshness	Respondent controls the freshness of product Yes=1; No=0	0-1	1,025	0.94	-
Nutritional properties	Respondent checks nutritional properties of food products. Yes=1; No=0	0-1	1,025	0.55	-
Ingredients	Respondent checks food ingredients. Yes=1; No=2	1-2	1,025	1.41	-
Best by date	Respondent checks food expiry date. Yes=1; No=0	0-1	1,025	0.96	-
Healthy life attitude (Hl $_r$)					
Dietary habits	Respondent follows a balanced and varied diet: never=1; rarely=2; sometimes=3; very often=4; always=5	1-5	1,011	3.27	1.57
Sport habits	Respondent practices sport regularly=1; 2 otherwise	0-1	1,025	1.48	-
Smoking status	Respondent does not smoke=1; 0 otherwise	0-1	1,025	0.79	-
Nutritional knowledge and source of information (Ks $_s$)					
Infomedia	Primary source of food information is from media (Tv, newspapers, etc.)=1; 0 otherwise	0-1	1,025	0.59	-
Infoexpert	Primary source of food information is from experts (doctors, health authorities, etc.)=1; 0 otherwise	0-1	1,025	0.41	-
Infofriends	Primary source of food information is from friends and relatives=1; 0 otherwise	0-1	1,025	0.42	-
Food knowledge	Level of food knowledge (from uninformed consumer=1 to very informed consumer=5)	1-5	1,025	3.54	0.93
Food safety attitude (Fs $_z$)					
Attention to food safety issue	Respondent pays attention to food safety issues (from strongly disagree=1 to strongly agree=5)	1-5	1,022	4.48	0.82
Level of food safety perceived	The level of food safety is good (from strongly disagree=1 to strongly agree=5)	1-5	1,025	2.43	0.90
BSE effect	Meat consumption after the bse crisis (unchanged=1; decreased during the crisis=2; definetively decreased=3)	1-3	1,025	1.51	0.69

Four models were estimated based on [1-4] and, for all the equations, a binary logit model was used as the dependent variables are expressed in a dichotomy way. This model takes the following form (Bohrnstedt and Knoke 1994):

$$(5) \quad logit(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \alpha + \sum_j \beta_j X_{ji} + e_i$$

where:

> $i = 1,...999$; corresponding to number of consumers;
> p_i = probability of the dependent variable taking a value of 1;
> $j = 1,...24$; corresponding to the number of independent variables;
> X_{ji} = independent variables;
> α = constant;
> β_j = regression coefficients;
> e_i is the error.

The variables of this model are usually non-metric (binary or categorical) (Upton and Cook 2006). Such variables can be measured by ordinal or nominal scales. To generate ordinal variables a 5 point Likert scale was used, where 1 corresponds to the minimum rank and 5 to the maximum rank that consumers assign to a certain behaviour or attitude. The adoption of the Likert scale was based on the fact that it is the most popular measurement scale in marketing (Mazzocchi 2008).

Equation (5) was estimated using the maximum likelihood estimation method. Pearson's Chi-Square Statistics confirms that all the models with included independent variables are significantly better than those models with just intercepts, and Nagelkerke's R^2 indicates an adequate goodness of fit.

Results

The survey reveals that the majority of consumers interviewed showed a high interest in different meat labelled information. More precisely, the most important information is the animals origin, in accordance with several empirical studies (Bernués et al. 2003, Roosen et al. 2003, Font I Furnols et al. 2011, Realini et al. 2013).

The results of the four logit models are shown in Table 4. Model MI_1 shows that some socio-demographic variables, such as, age (-0.154), gender (0.314), and income (-0.138), significantly affect the dependent variable 'meat label use'. Young people, female, and consumers with low income are more likely to use the meat label. According to other empirical studies (Drichoutis et al. 2005) the negative sign of income could be connected to the time pressure of high revenue consumers. Other possible explanations could be related to the higher time availability of students or young adults.

The variables connected to healthy life attitudes do not affect the dependent variable, whereas among the variables connected to product quality attributes: 'traceability' (0.156), 'certification' (0.153), 'product freshness' (0.632), 'best by date' (2.335), and ingredients (-0.669) have a

significant role in the model. This indicates that consumers who pay the most attention to information reported on food products are more likely to check meat labelling. Those respondents who obtained food information through the media were more likely to use meat labels (0.296). Moreover, the variable connected to the decrease in meat consumption after the BSE crisis is positive and statistically significant (0.221), indicating that consumers with a high safety risk perception are more likely to read meat labels.

Models MI_2 MI_3 and MI_4 reveal statistically significant and negative relationships with the independent variable 'level of food safety perceived'. These relationships suggest that consumers who seek specific information on meat labels are motivated by a low-level of food safety perceived. Label information is considered a method to reassure consumers of meat product safety.

Model MI_2 shows statistically positive relationships with the variables: 'BMI' (0.167), 'Ingredient' (0.829), and 'Food Knowledge' (0.285), and negative relations with the variables: 'Age' (-0.405) 'Education' (-0.614), and 'Level of food safety perceived' (-0.240). This model suggests that young people with a good level of food knowledge care about the origin of meat products. This could indicate that specific information is understood and considered important only by consumers who have a certain level of food knowledge. Moreover, they are interested in the ingredients of products, highlighting that consumers who check the origin of meat are interested in specific product quality and characteristics, which are usually not highly visible, due to the high proximity level of information. Model MI_3 concerning cattle breeding reveals statistically significant relations with the variables: 'Certifications' (0.170), 'Ingredients' (-0.406), 'Food Knowledge' (-0.159), and 'Level of food safety perceived' (-0.211). The positive sign of the variable 'Certifications' suggests that consumers looking at the information related to the system of cattle breeding are particularly interested in those quality attributes that are easily detectable by consumers (like PDO, PGI, etc.). Moreover, they do not seem interested in looking at labelled information with a high level of proximity, such as ingredients. As explained previously, specific labels in Italy have been created to communicate the characteristics of cattle breeding, which are often easily visible through specific signals put on the top of the meat package. Thus, MI_3 describes consumers' interest in quality signals for their food choices. Consumers checking for the system of cattle breeding do not appear to care about the meaning of the information transmitted by the labels. They prefer to look at simple and easily visible quality indicators in order to form quality and safety judgements regarding the meat. The variable for consumer knowledge shows a negative relationship with the dependent variable, suggesting that when the level of consumers' food knowledge is low, the use of this kind of information format is preferred.

Finally, model MI_4 concerning cattle feeding points especially to 'Age' (-0.253), 'Income' (0.156) 'Education' (-0.327), 'BMI' (0.157), 'Traceability' (0.194), and 'Level of food safety perceived' (-0.180) as significant variables. Young people with a high income level seem to be more interested in such information. Moreover, the positive sign of the variable 'Traceability' indicates that consumers who read such information are particularly interested in the safety characteristics of food products.

Table 4. Estimates of the Four Models

	Meat Label Use (MI$_1$)		Country of Origin (MI$_2$)		Cattle Breeding (MI$_3$)		Cattle Feeding (MI$_4$)	
	β	Sig.	β	Sig.	β	Sig.	β	Sig.
α	-3.508	0.005	-4.408	0.000	-3.030	0.469	-3.939	0.419
Socio-demographic and individual characteristics (Sd $_g$)								
Age	**-0.154**	0.008	**-0.405**	0.000	-0.020	0.757	**-0.253**	0.000
Gender	**0.314**	0.072	-0.211	0.385	-0.298	0.110	-0.049	0.800
Income	**-0.138**	0.087	0.163	0.159	-0.009	0.917	**0.156**	0.092
Education	0.032	0.740	**-0.614**	0.000	-0.128	0.233	**-0.327**	0.003
Being shopper	-0.099	0.596	0.193	0.466	-0.049	0.804	0.188	0.365
BMI	0.073	0.523	**0.167**	0.054	0.043	0.519	**0.157**	0.025
Quality attributes (Qa $_h$)								
Price	0.050	0.493	-0.093	0.366	-0.086	0.274	-0.113	0.172
Origin	-0.044	0.586	-0.094	0.430	-0.046	0.593	0.069	0.442
Traceability	**0.156**	0.073	0.130	0.329	0.134	0.184	**0.194**	0.063
Certifications	**0.153**	0.067	0.103	0.432	**0.170**	0.098	0.055	0.603
Freshness	**0.632**	0.089	0.636	0.318	-0.257	0.618	0.667	0.198
Nutritional properties	-0.108	0.253	-0.074	0.752	0.140	0.421	0.180	0.324
Ingredients	**-0.669**	0.000	**0.829**	0.003	**-0.406**	0.029	-0.011	0.956
Best by date	**2.335**	0.000	-18.993	0.999	0.619	0.512	-0.675	0.557
Healthy life attitudes (Hl $_r$)								
Dietary habits	0.281	0.128	0.020	0.783	0.030	0.594	0.068	0.247
Sport habits	0.220	0.169	0.126	0.567	-0.116	0.490	0.012	0.948
Smoking status	-0.047	0.347	0.200	0.449	0.221	0.280	0.196	0.355
Nutritional knowledge and source of information (Ks $_s$)								
Infomedia	**0.296**	0.062	-0.146	0.521	0.197	0.255	0.088	0.627
Infoexpert	0.245	0.148	0.213	0.346	0.190	0.276	0.103	0.572
Infofriends	-0.035	0.831	-0.194	0.385	-0.042	0.808	0.065	0.716
Food knowledge	0.087	0.291	**0.285**	0.016	**-0.159**	0.081	0.026	0.781
Food safety attitude (Fs $_z$)								
Attention to food safety issue	0.042	0.692	-0.065	0.706	0.076	0.529	-0.108	0.406
Level food safety perceived	0.089	0.322	**-0.240**	0.052	**-0.211**	0.026	**-0.180**	0.069
BSE effect	**0.221**	0.056	-0.169	0.252	0.017	0.886	-0.138	0.260
Chi-Square (Sig. 0.000)	130.43		67.21		42.80		45.13	
Nagelkerke R Square	0.18		0.15		0.08		0.09	

Concluding Remarks

This study extends previous research by examining consumer attitudes towards information concerning animal origin and cattle breeding and feeding systems. Empirical analysis shows that Italian meat consumers are generally interested in obtaining this type of information. Favorable attitudes towards product labelling could be related to a loss of trust in authorities and the food chain after a series of food safety scandals in the European Union. Besides adopting policy measures to guarantee meat safety, labelling systems have played an important role to regain consumers' trust in the European beef production.

In Italy different types of meat labels have been introduced by public and private regulation. The information concerning the systems of cattle breeding is usually easily visible through big characters and brightly colored labels. Information related to the animal origin and cattle feeding is part of the meat traceability label or firm label which usually contains high proximity information related to date of birth, animal gender, name and place of cattle farm, race, name of slaughterhouse, and date of slaughtering.

The models analysed in this paper reveal that reading meat labels is linked to the level of perceived meat safety. Thus, traceability labels are a good instrument to help regain consumer confidence in the safety of meat products.

The analysis found that consumers using meat labels show an interest in most product quality attributes. This means that meat label readers are inclined to use product information to guide their purchasing preferences.

Moreover, it is possible to highlight different aspects of specific labelled information which may influence the use of such information. The first relates to 'visual clutter' of labelled information. The analysis reveals that cattle breeding information is used by consumers who have positive attitudes towards meat quality indicators (certifications), and are easily visible during product selection. On the other side, information on meat origin and cattle feeding is used by consumers who look for specific labelled information with a high proximity level during product selection, such as the list of ingredients and traceability labels.

The second aspect that seems to impact the use of different labelled information relates to consumers food knowledge. The level of food knowledge influences the use of information related to meat origin (positively) and cattle breeding (negatively). Such results suggest that certain types of information are used on the basis of the consumers' ability to comprehend labelled information.

Another interpretation of our results could be explained by Grunert's Total Food Quality model (Grunert 2005). According to this model, the use of different labelled information by consumers may be linked to the information they perceive as important during decision-making. More precisely, consumers checking for the origin of meat seem to pay attention to the ingredients in order to form quality judgements. Consumers interested in information regarding cattle breeding are using information on voluntary certification schemes to form purchasing preferences. Consumers looking at cattle feeding information pay attention to product traceability.

This analysis allows us to draw policy and managerial implications. The voluntary meat labelling seems to have positive effects on consumers. Meat labelling allows consumers to make more informed choices. Increased transparency allows consumers to make choices in line with their preferences and gives food producers the opportunity to regain consumer trust after repeated food scares within this sector.

From a managerial point of view, this paper confirms that quality attribute labelling related to meat processing engages consumers' positively. Most consumers read meat label information; therefore, highlighting is a good strategy for firms if they want to differentiate their meat products.

The differentiation of meat products through labelled information can also have a positive effect on other segments of the supply chain. For example, labelling different quality attributes could offer livestock farms a way to differentiate meat products and gain premium prices. Moreover, the certification of meat information can imply more coordinated governance of vertical relationships due to an increase of transaction bilateral dependency and the implementation of new selection procedures for raw materials or new breeding methods (Banterle et al. 2006).

However, as firms develop differentiation strategies for their products they should consider two important observations found to influence consumer purchasing behaviors. The first relates to the quantity of credence attributes on labelling. Consumers are often not able to process all information contained on product packaging and labels because of bounded rationally or time constraints. This can lead to consumer confusion or a lack of interest in labelled information. Therefore, an effective choice of mixed attributes should be placed at the center of the firm's communication strategy.

The second aspect concerns the consumer target the firm decides to reach through labelling. Empirical analysis highlights that consumers seek different information from meat labels. Some pay attention to voluntary certification schemes which are usually easily visible by color and dimension. These consumers do not reveal adequate food knowledge suggesting that they do not really care about the meaning of the information labelled, but they use it just as a quality indicator when making food choices. In this scenario the firm communication strategy should be oriented especially on the visual presentation, in order to capture consumer attention. Other meat consumers are not influenced by a label's 'visual clutter' but by specific labelled information, such as ingredients and/or traceability. The communication strategy related to consumers interested in such information should be concentrated on the information reliability transmitted by the label. In this case further explanations of the meat labelled attributes could help increase consumer awareness and trust when making meat choices. However, further research is needed to verify if it is possible to draw different consumers' profiles on the basis of the labelled information on meat products using, for example, cluster analysis. Moreover, future analysis could also further examine the role visual characteristics of labels have on consumer choices in other European countries.

Acknowledgements

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