Good, safe and fair: Quality perception and consumer demand of locally produced beef in Southern Italy

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Abstract

The increasing concern amongst consumers regarding the safety and quality of the beef that they buy is the result of food scares that have characterized the beef market in the last two decades. These scares, together with environmental and ethical concerns, caused consumers to reflect upon the quality of the beef they eat. The aim of this paper is to identify which quality characteristics influence the incidence of local beef consumption on the total consumption of beef. It is assumed in this study that such choice is a response to a process of quality evaluation, which occurs combining specific quality attributes and socially constructed food quality criteria strictly linked to a socially fair dimension of local productions. Consumers who habitually purchase local beef at the butcher shops were the focus of our empirical strategy. Data were collected by administering a face-to-face questionnaire to 160 consumers in Sicily (Southern Italy), right after their purchases at the butcher shops. The results of this study suggest some implications in defining locally produced beef quality, making more accurate strategies possible when supporting the spread of production and consumption of beef at the local level.

***Keywords**: Local food, Quality cues, Quality attributes, Conventions of quality, Consumption.*

Résumé

La préoccupation croissante des consommateurs à l'égard de la salubrité et de la qualité de la viande bovine qu'ils achètent est le résultat des crises alimentaires qui ont caractérisé le marché de la viande bovine ces deux dernières décennies. Ces craintes, s'ajoutant aux préoccupations environnementales et éthiques, ont amené les consommateurs à réfléchir à la qualité de la viande qu'ils consomment. Le but de cet article est d'identifier les caractéristiques de qualité qui influencent l'incidence de la consommation de viande bovine locale sur la consommation totale de viande bovine. Dans cette étude, nous avançons qu'un tel choix est une réponse à un processus d'évaluation de la qualité qui combine attributs de qualité spécifiques et critères de qualité alimentaire construits socialement, strictement liés à une dimension socialement équitable des productions locales. Nous avons focalisé notre stratégie empirique sur les consommateurs ayant l'habitude d'acheter de la viande locale dans les boucheries. Les données ont été collectées à l'aide d'un sondage direct auprès de 160 consommateurs en Sicile (Sud de l'Italie), juste après leur achat dans les boucheries. Les résultats de cette étude suggèrent certaines implications dans la définition de la qualité de la viande bovine produite localement, permettant d'établir des stratégies plus précises pour soutenir l'expansion de la production et la consommation de viande bovine à l'échelle locale.

Mots-clés: aliment local, indicateurs de qualité, attributs de qualité, conventions de qualité, consommation.

1. Introduction

Meat is part of the habitual diet of many consumers in the Western countries, as it is an important source of proteins and essential nutrients, including zinc, iron and vitamin B12 (McAfee *et al.*, 2010). During the past two decades food safety crises have led to a loss of consumer confidence in the safety and quality of meat (Loureiro and Umberger, 2007; Gellynck *et al*., 2006; Roosen *et al,* 2003). This is particularly true for beef: its safety has been seriously compromised by Bovine Spongiform Encephalopathy (BSE) and its human equivalent, Creutzfeld-Jakob disease (CJD). As a result, in Europe the consumption of beef has decreased from 21.5 kilos per capita in 1990 to 18.6 kilos per capita in 1996 (Roosen *et al*, 2003). Beef consumption fell very swiftly in Italy, where the demand for beef decreased on average by 22.6% during that period (Mannion *et al*., 2000), and a further 9.6%, between 2000 and 2001, concurrently with the second BSE crisis (figure 1). In the following years, other food scares including antibiotic residues and the illegal use of growth hormones have caused a further fall, adding to the overall negative trend in beef consumption. Consequently, in Italy beef consumption has decreased from 24.6 to 20.9 kilos per capita during the years between 2002 and 2014. Part of this decrease may also be attributed to additional factors, including a change in life-style and the economic crisis that has occurred in Italy since 2008, which may be induced a small substitution effect in favour of chicken and pork consumption, whose price is on average cheaper than beef.

However, despite the fall in consumption, beef remains an important item in the Italian diet, and in the last few years part of its purchase seems increasingly oriented towards locally produced beef (Schifani and Migliore, 2011; Cersosimo, 2011; Bioreport, 2013). A degree of interest towards locally produced meat seems also to occur at the European level. A consumer market study reveals that 10% of EU consumers, in 2010, indicated that they buy meat or meat products at short supply chain, while 7% of consumers mention this option as their preferred retailer for meat (EU Custom Research and Coordination Centre, 2012).

In the literature on consumer behaviour, the local food consumption trend is explained by a consumer perception of fresher, safer and healthier food (Lanfranchi & Giannetto, 2015; Roininen *et al.*, 2006), as well as by a new consumer demand for more ethical and environmental friendly productions (Troy and Kerry, 2010).

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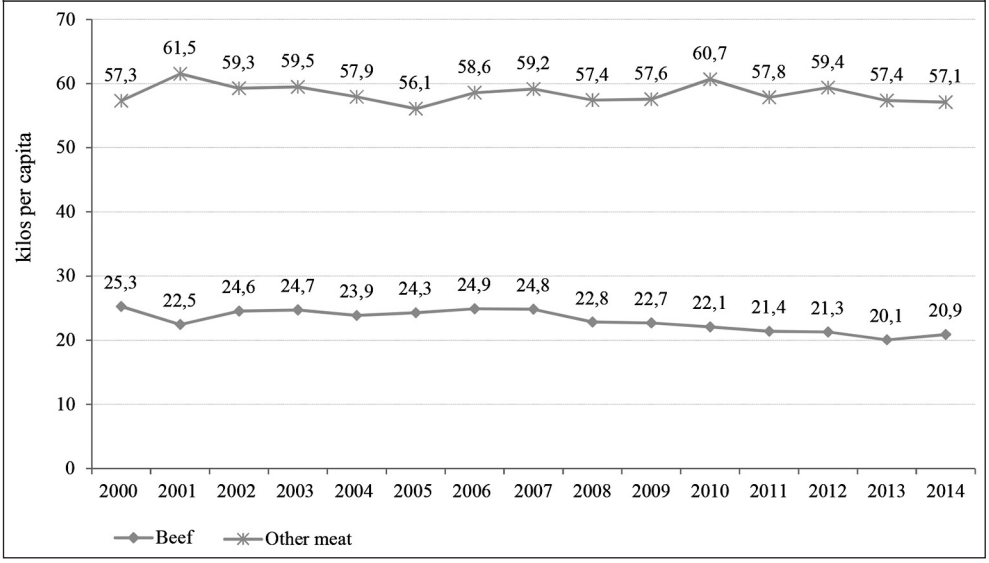
Figure 1 - *Consumption of meat in Italy between 2000 and 2014 (Kilos per capita).*



This means that the consumer's perception of quality has undergone important changes. Therefore, beef quality demanded by consumers depends not only on the product's objective characteristics, such as nutritional, microbiological, and processing-technological characteristics (Becker, 2000), but also on intangible factors associated with it, including food safety and the way in which food is produced in terms of impact on the environment, ethical content (fair wages, animal welfare), and the area where the production takes place (Panzone *et al.*, 2016; Kokthi *et al.,* 2015). Such intangible factors are classified in the literature as credence attributes, and their assessment by consumers requires a judgment or a certification from a third-part authority (Caswell and Mojduszka, 1996). However, in short supply chain other types of credence attributes are identified, some of which are based on a socially fair dimension of local production, which is not, however, recognizable through a certification system. They are identified as conventions of quality and are based on a range of socially constructed food quality criteria, which are related to factors such as support for small family farms, trust in farmers, landscape conservation and the re-discovery of food traditions (Kirwan, 2006; Goodman, 2003). To the best of our knowledge, conventions of quality are analysed only with reference to general short supply chains organization (Kirwan, 2006), neglecting to identify their effect on a specific locally produced food, such as beef. It is reasonable to believe that a choice to consume locally produced beef is a response to a process of quality evaluation, which occurs combining specific quality attributes and the most informal conventions of quality.

The aim of this paper is to identify which quality characteristics influence the incidence of local beef consumption on the total consumption of beef. The focus of our empirical strategy were consumers who habitually purchase beef at the butcher shops. Data were collected by directly administering a face-to-face questionnaire to 160 consumers in Sicily (Southern Italy), right after their purchases at the butcher shops. The purchased beef is produced by a local consortium, named "Consorzio Carni di Sicilia" (or Sicilian beef consortium), which certifies the safety and sustainability of local beef across the overall chain, from the livestock to butcher shops.

The results of this study suggest some implications in defining locally produced beef quality, making more accurate strategies possible when supporting the spread of production and consumption of beef at the local level.

2. Consumer perception of beef quality

Although several definitions of quality have been proposed in the literature, it is a widely held opinion that the quality of a food product should reflect the level of satisfaction which the consumer derives from it, providing characteristics that he/she desires.

Steenkamp (1989) suggests that assessment of the quality of a product takes place through a perception process, starting with the acquisition of quality cues, which are informational stimuli that can be ascertained by the senses prior to consumption. Quality cues are categorized as either intrinsic (e.g. appearance, colour, visible fat, etc.) and extrinsic cues (such as price, brand name, place of origin, etc.), and their classification depends on whether they refer to the physical characteristics of the product or to the information available about it (Bernués *et al.*, 2003a; Issanchou, 2003; Oude Ophius and van Trijp, 1995). These cues are integrated by the consumer to form beliefs about quality attributes (Steenkamp, 1990). Conversely, quality attributes can be ascertained upon consumption of a product and they symbolize the utility-generating functional and psychological benefit provided by it (Steenkamp, 1990). Quality attributes are categorized in experience attributes and credence attributes, and they represent "what the product is perceived as doing or providing for the consumer in relation to his wants, and form the basis for consumer preferences" (Steenkamp and van Trijp, 1996:198). More importantly, experience and credence quality attributes are considered of paramount importance in stimulating repeat purchase behaviour (Steenkamp, 1989).

In the case of beef, the most important experience attribute reported in the literature are taste, leanness, tenderness, juiciness and convenience (Van Wezemael *et al*., 2010; Troy and Kerry, 2010; Banović *et al*, 2009). From the consumer's point of view, convenience means ease of purchase and quick consumption, which permits to save time and physical or mental energy at all stages of the overall meal process.

Prior to consumption, and in particular at the point of purchase, such experience attributes may be predicted by some intrinsic cues, such as colour, fat content, and cut (Banovíc *et al*., 2009).

Credence attributes refer to those qualities that cannot be ascertained even after normal use of the product (Steenkamp, 1990), and their increasing importance in beef product is a consequence of increasing consumers concerns about safety, health, origin, environmental protection and animal welfare factors (Benués *et al*, 2003a; Issanchou, 1996). Unlike experience attributes, credence attributes mainly refer to the quality of the production process and not to the product itself, which to be recognized needs informational cues. Extrinsic cues are the principal means of informing consumers on the credence quality attributes of beef, and it occurs by using label information. Beef label can perform many different functions for both producers and consumers, among which the differentiation of the products from those of competitors by enlarging product attractiveness, and as an answer to the imperfect dilemma in beef chain (Loureiro and McCluskey, 2003; Mojduszka and Caswell, 2000). The correct dissemination of information can restore consumer trust and reduce the level of asymmetry information between producer and consumer, and the consumer risk towards the quality and safety of beef (Bernuès *et al.*, 2003b). It is not a coincidence, in fact, that one of the most recent issues in food labelling deals with traceability and origin labelling beef (Banterle & Stranieri, 2008). In addition, label is a useful instrument to inform consumers about the process by which beef is obtained, such as environmental protection and animal welfare, signalled for example by organic certification (Napolitano *et al.*, 2010). The increasing consumer interest towards these credence attributes seems due to the growing consumers' awareness of the environmental impact of their food choice, as well as the need to know how animals are reared, transported and slaughtered (Troy and Kerry, 2010). In addition, empirical studies suggest that the most sought after credence attribute of beef is safety (Migliore et al., 2015; Angulo and Gil, 2007), which is related to various factors, including banning of fertilisers and pesticides in crop production, GMO and animal flour in animal feed (Napolitano *et al.*, 2010). Other consumer credence attributes that in recent years are acquiring increasing importance to consumers are related to absence of growth hormones and antibiotic residues in beef (Angulo and Gil, 2007). A further attribute very appreciated by consumers is expiration date, which is shown on the label of packaged beef and is considered a proxy of freshness and nutritional value (Canavari *et al.*, 2016). Beyond the organic certification, to signal credence attributes the European Union lays down standards for control, for the prevention of risk and for appropriate labelling of meat products, such as traceability and origin labelling. Apart from the mandatory label system, a voluntary scheme could be adopted to let other quality information be reported on beef label (Bernués *et al.*, 2003b). In Europe such voluntary scheme is regulated under Reg. (CE) 1760/2000 (modified by the Reg. UE 653/2014), in which, besides some mandatory information related to beef traceability and food safety, other supplementary information may be added to the label.

In the literature on local food, new forms of credence attributes are recognised which are not clearly identifiable through a certification system (Kirwan, 2006; Goodman, 2003). In other words, perception of quality also seems to be based on a range of socially constructed food quality criteria related to a socially fair dimension linked to local productions. These criteria, which originate from face-to-face communication between individuals engaged in market transactions, are connected to ideas such as support for local rural communities and small family farms, trust in peasant farms and landscape conservation. Social criteria give rise to conventions of quality, which help consumers overcome information asymmetries about products and recognize food quality through a process of interaction between individuals, who interpret and coordinate quality during market transactions (Kirwan, 2006). Conventions of quality take their cues from relations of proximity, trust, local needs, culture and regional traditions (Kirwan, 2006). In short supply chain conventions of quality are identified as civic, domestic and regard conventions, which can be seen as additional benefits associated to the consumption of locally produced food. In civic convention participants in the transaction evaluate quality in terms of benefits for society as a whole. Purchase of local food is recognised by consumers as being able to maintain rural landscape and to increase social and economic conditions in rural communities, by recirculating local financial capital, creation of new jobs and encouragement of new forms of entrepreneurship (Cranfield *et al.*, 2012;). In domestic convention food quality is perceived within a single attribute which includes the maintaining and re-discovery of food traditions and the values of connection with local producers (Nygård and Storstad, 1998). Finally, regard convention arises from sentiments like friendship, respect, recognition and sociality. In other words, regard convention takes its cue from repeated personal interaction with producers, which represents a criterion to establish reliability, reputation and sense of belonging to a community, as an additional motivation for economic exchange within particular contexts (Kirwan, 2006).

3. Methodology

3.1. The Consorzio Carni di Sicilia

The Consorzio Carni di Sicilia was created in 2007 and it is the only organization adopting procedural guidelines for voluntary beef labelling (under Reg. CE 1760/2000, modified by Reg. UE 653/2014) in Sicily; it certifies local beef across the overall chain (from the livestock to butcher shops). The consortium comes from the union of 10 previous producers associations. It includes 152 cattle farms, 11 feed mills, one slaughterhouse, 2 meats laboratories and 19 butcher shops, distributed in ten towns localized near the area where beef production takes place. The latter falls into

an area partially included in two natural parks[1] and is mainly characterized by high altitude natural pastures (over 1,000 meters above sea level). The procedural guidelines adopted by the consortium aim to achieve safety and sustainable productions; in many cases such procedural guidelines are added to the organic certification of livestock (in over 80% of cattle farms). The procedural guidelines regulate the adherence to the voluntary labelling system of the actors in the beef chain and certifies the origin of the animals, the animal feed production (without animal flours), the safety of beef (without antibiotic residues, as well as pesticides and chemicals in animal feed), environmental protection, animal welfare, ensured by free razing, and the livestock farms where cattle take origin. Such procedural guidelines ensure the safety and beef quality through precise self-control procedures carried out along the supply chain. In addition, such certification system is guaranteed by the strict control exercised by the Italian Ministry of Agriculture via an inspection body, in full guarantee of consumers. Such certification system is shown at the butchers shop or on the label attached to the packaging and is accompanied by a logo useful to identify the locally produced beef by the consortium.

Information gathered from local producers and stakeholders members of the consortium has indicated that local beef, due to its stable supply and to strong local demand, is an ideal product for small and medium-size producers to create market niche. On the production side, this is an important opportunity to stay in the market, because the structural characteristics of livestock farms make it difficult for undifferentiated product to be competitive on globalized markets. On the demand side, local beef is a highly desiderated product, since it is assumed that local beef is of higher quality than beef purchased in supermarket.

The average price[2] of locally produced beef sold at the butcher shops is around 11.00€/kilos, in view of an average of 9.50€/kilos of other (undifferentiated) beef sold in other butcher shops and supermarkets.

In addition, the consortium aims to extend the sale of local beef in some main Sicilian cities. In fact, a big butcher shop is due to open in Palermo, the most populous city near the area where beef production takes place.

3.2. Data collection and method

Data were collected by the direct administration of a questionnaire to 160 habitual local beef consumers during the winter 2014/2015. The interviewees were selected right after their purchases at the butcher shops in all ten towns. These towns are characterized by a total resident population around 55 thousand inhabitants in 2014; their size ranges from 1,443 to 14,452 inhabitants. We decided to interview habitual consumers of local beef products in order to understand how perceived attributes match their consumption experience. The questionnaire was structured in three sections and it consists of 23 questions (table 1). A first set of variables, expressed in a metric scale (Likert scale 1-6, where: 1= rarely; 2= 1-2 times per year; 3= 1 time per month; 4= 2-3times per month; 5= weekly; 6= more times per week), was used to investigate frequency of purchase, the average amount (in kilos) of their consumption of local beef and of other type of beef usually consumed by the family during two weeks. Through the latter was possible to build the incidence of local beef consumption on the total consumption of beef. The second section of the questionnaire was used to capture the principal quality attributes and quality conventions that consumers use to qualify food and beef, which are identified in the literature. Among the latter, we have decided to exclude from our analysis: animal feed without GMO and growth hormones, because they are not admitted by the Italian law. In addition, domestic and regard conventions are identified in the literature on local food only with reference to direct relationship established during market transactions between producers and consumers. We have decided to include these conventions in our analysis even in absence of such relationship. Also, considering that all consumers interviewed come from small towns which are included in a rural area, it is reasonable to hypothesize a direct knowledge of the producers as well as a sense of belonging to a community, which could represent an additional motivation to consume locally produced beef.

In this same section, a set of questions was presented to the interviewees, who were asked to rate the level of importance of some quality characteristics of the local beef they consume, using a Likert scale ranging from 1 to 7 (where 1 was not at all important and 7 was highly important). Finally, the third section of the questionnaire included socio-demographic indicators of the interviewees such as age, gender, number of household members, education (organized into four category: primary school, lower secondary school, upper secondary school, university degree or higher), presence of household members under the age of 14, and household monthly net income (organized in six category: <1,000; 1,001-2,000; 2,001-3,000; 3,001-4,000; 4,001-5,000; >5,000 euros).

To identify which quality characteristics influence the incidence of local beef consumption on the overall consumption of beef a Tobit model was implemented (Greene, 2003). Tobit model refers to regression models in which the range of the dependent variable is constrained or limited in some way (Greene, 2003).

The Tobit model is an efficient method for estimating the relationship between some explanatory variables and truncated or censored dependent variable. In fact, due to a strong consumer demand of locally produced beef, which has produced a high concentration of 100% of local beef consumption, in the Tobit model, observations were right-censored. The general form of Tobit regression model[3] is:

$$y_i^* = x_i' \beta + \varepsilon_i;$$

[1] This refers to both the Regional Natural Parks of Madonie and Nebrodi, which are two of four Regional Natural Parks to be established in Sicily.

[2] Including all beef cuts.

[3] See appendix A for more details.

Table 1 - *Variables collected from the questionnaire.*

Explanatory variables	Type^	Mean	Min	Max
Frequency of local beef consumption	Cat	2.43	1	6
Amount of 'local' beef consumed during two weeks	C	1.98	0.5	5
Amount of other types of beef consumed during two weeks	C	0.41	0.2	5.5
Taste *(experience attribute)*	Cat	5.99	1	7
Leanness *(experience attribute)*	Cat	4.16	1	7
Juiciness *(experience attribute)*	Cat	4.31	1	7
Tenderness *(experience attribute)*	Cat	4.98	1	7
Convenience/Easiness of consumption *(experience attribute)*	Cat	4.81	1	7
No animal flour in animal feed *(credence attribute)*	Cat	5.27	1	7
No pesticides and chemicals in animal feed*(credence attribute)*	Cat	5.32	1	7
No antibiotic residues *(credence attribute)*	Cat	5.17	1	7
Environmentally friendly produced *(credence attribute)*	Cat	5.06	1	7
Expiration date (*credence attribute*)	Cat	3.08	1	7
Animal welfare *(credence attribute)*	Cat	5.81	1	7
Domestic convention *(convention of quality)*	Cat	5.11	1	7
Regard convention *(convention of quality)*	Cat	4.07	1	7
Civic convention *(convention of quality)*	Cat	4.18	1	7
Age	C	45.07	19	79
Gender *(1 if woman)*	D	0.51	0	1
Education	Cat	2.86	1	4
Number of household members	C	3.34	1	6
Presence of household members under 14 *(1 if yes)*	D	0.37	0	1
Household monthly net income	Cat	3.83	1	6

^ Variable type: C = continuous; D = dummy; Cat = categorical.

where i=1,..., 160. In our study y_i^* is the latent variable of the observed variable y, which is the incidence of local beef consumption on the total consumption of beef during two weeks, x_i' are independent variables and in our study they represent the principal quality attributes and quality conventions that consumers use to qualify food and beef, as well as some socio-demographic characteristics of interviewees; while β are regression coefficients and represent the partial effect of x on E($y^*|x$). The term ε is the error term.

4. Results and discussions

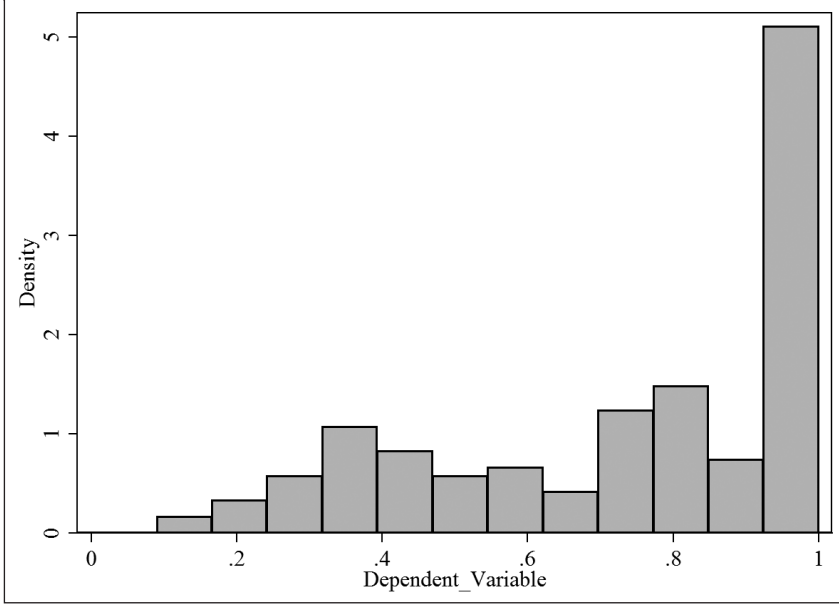
The total amount of self-reported beef consumption by the consumers interviewed in 2014 is on average 23.8 kilos per capita[4], which is almost in line with the Italian per capita consumption of beef in that period (equal to 20.9 kilos). The frequency of local beef consumption is 2-3 times per month for around 32% of the consumers interviewed and 1 time per week for another 30%. Results reveal that on average around 70% of the total consumption of beef is oriented towards the consumption of locally produced beef, with an incidence of consumption ranging from 9% to 100% of the overall beef consumption. Among the consumers interviewed, almost 39% has declared that they consume only locally produced beef (figure 2).

The explanatory variables implemented in the model approximate the quality attributes that consumers consider to qualify locally produced beef, as well as some socio-demographic characteristics of interviewees. In table 2 are reported the results of the econometric model, where the variables with a level of significance of at least 10% are highlighted in bold.

All the signs of the estimated coefficients are positive and highly significant, consistent with the expected signs. This means that the incidence of local beef consumption on the total consumption of beef increases with the rise in all the explanatory variables. The results obtained describe the effect on consumers' choice of experience and credence quality attributes, as well as conventions of quality. In particular, the incidence of local beef consumption increases with the growing importance attributed to some experience and credence attributes, as well as one convention of quality. It was found that, among experience attributes, leanness, juiciness and tenderness were important factors that affect consumer choice; while taste and convenience were statistically not significant. Concerning the latter, it was referred to the beef ready to be cooked (e.g. breaded beef, hamburger and roulade) which showed no effect on the consumption of locally produced beef by the consortium. On the contrary, the non-significance of taste may be due to the fact that on average, as it is shown on table 1, almost all interviewees consider this experience attribute highly important.

Environmentally friendly beef and the absence of residues of antibiotics, as well as pesticides and chemicals in animal feed are among the credence attributes which showed an effect on the consumption of locally produced beef. Other credence attributes, such as absence of animal flour in animal feed, expiration date and animal welfare were statistically not signifi-

Figure 2 - *Distribution of the incidence of the local beef consumption*



[4] It is a per capita consumption of beef calculated on the basis of the self-reported total amount of beef consumed by the family during two weeks and the number of household members.

Table 2 - *Results of the econometric model (Tobit model).*

Dept. variable: Incidence of per capita local beef consumption on total per capita consumption of beef — Number of obs = 160; F(21, 141) = 108.08; Prob > F = 0.000

Log pseudolikelihood = 86.466678

Explanatory variables	Coef.	*p*	95% Conf. intervals	
Taste	0.1033		-0.0039	0.0246
Leanness	**0.0314**	***	**-0.0035**	**0.0664**
Juiciness	**0.0206**	***	**0.0045**	**0.0458**
Tenderness	**0.0170**	***	**-0.0005**	**0.0346**
Convenience/Easiness of consumption	0.0025		-0.0072	0.0123
No animal flour in animal feed	0.0030		-0.0115	0.0176
No pesticides and chemicals in animal feed	**0.0302**	*	**0.0089**	**0.0516**
No antibiotic residues	**0.0207**	*	**0.0071**	**0.0343**
Environmentally friendly produced	**0.0462**	*	**0.0193**	**0.0730**
Animal welfare	-0.0042		-0.0176	0.0092
Expiration date	-0.0049		-0.0257	0.0159
Domestic convention	-0.0058		-0.0191	0.0075
Regard convention	-0.0059		-.03024	-0.1836
Civic convention	**0.0388**	*	**0.0172**	**0.0604**
Age	**0.0012**	**	**-0.0001**	**0.0021**
Gender	-0.0217		-0.0535	0.0101
Education	**0.0559**	*	**0.0233**	**0.0885**
Presence of household members under 14 year old	-0.0061		-0.0242	0.0365
Household monthly net income	**0.0394**	*	**0.0184**	**0.0603**
_cons	-0.2630		-0.3830	-0.1431
/sigma	0.0784		0.0678	0.0890

Obs. summary:
0 left-censored observations
98 uncensored observations
62 right-censored observations at dependent variable ≥1

*1% **5% ***10%

cant. The latter result could be due to the fact that BSE scandals, which were caused by unsafe animal flour in animal feed, had occurred some years before and the absence of recent events may have lessened the risk perception.

With reference to animal welfare, the statistical non-significance could be determined by the fact that the consumers surveyed, as shown in table 1, have attributed on average a high level of importance to how the animals are reared, transported (from farms to slaughterhouse) and slaughtered. Finally, contrary to what was shown in other empirical analyses, for which expiration date is one of the most important characteristic when buying beef product (Canavari *et al*., 2016), in our study we assume that the statistical non-significance of this variable is due to the characteristic of the local beef, which at the butcher shops is mainly sold freshly cut and unpackaged.

The conventions of quality, both domestic and regard conventions, are statistically not significant in our analysis. This result could be explained by the fact that, contrary to what occurs at short supply chains, and in particular farmers markets, where transactions take place directly between producers and consumers, in our study such interaction is absent.

More importantly, only civic convention showed an effect in increasing the consumption of locally produced beef. It represents an additional benefit directly associated with the socially fair dimension of local productions, and could be considered a socially mediated type of credence attribute that is not clearly identifiable through a certification system. Such result suggests that the consumption of a high incidence of local beef on the total consumption of beef is due to the growing importance the consumers attribute to being able to improve social and economic conditions in rural communities.

Among the socio-demographic variables only age, education and household monthly net income showed an effect in increasing the consumption of local beef. Also, by observing the signs of the coefficients we can infer that the incidence of local beef on the total beef consumed increases with age and the level of education. Furthermore, as we expected, considering that the local beef certified by the consortium is sold at a higher price than other beef sold in the area (11.00€ vs. 9.50€), the high incidence of local beef consumption on total beef consumed is affected by the growing household net income of the consumers interviewed.

Conclusions

The increasing concern amongst consumers regarding the safety and quality of the beef they buy is the result of food scares that have characterized the beef market in the last two decades. These scares, together with environmental and ethical concerns, caused consumers to reflect upon the quality of beef they eat. Such phenomenon seems to have been encouraging an increasing part of Italian consumers to purchase locally produced beef. As we hypothesized when undertaking this study, such choice is a response to a process of quality evaluation, which occurs combining specific quality attributes and informal social mediations strictly linked to a perceived socially fair dimension of local productions. These results could have significant implications in defining locally produced beef quality. In particular, when in the consumers' choice locally produced foods are involved, other quality characteristics, which originate from informal social mediation, need to be considered. Civic convention is one of quality characteristics which showed an effect on consumers' decision making, since purchase of local food is recognised by consumers as being able to improve social and economic conditions in rural communities. Moreover, the findings indicate that consumers' choice towards locally produced beef is also influenced by additional food safety information, which are guaranteed through the voluntary certification adopted by the consortium. In fact, beyond the mandatory requirements, some of which prescribed by the Reg. (CE) 853/2004 and the Reg. (CE) 1760/2000, which ensure the hygienic and microbiological safety as well as the traceability of beef, the voluntary certification explicates, by private label, the absence of residual antibiotics in the beef and the absence of synthetic chemicals in animal feed. It is important to notice that, among food safety attributes, the guarantee of the absence of animal flour in animal feed is not considered an attribute capable to influence consumer choice, and this could be explained, as mentioned in the results, by considering the recent lack of BSE scandals which have contributed to lessen risk perception. In addition, buying locally pro-

duced beef seems also influenced by ethical and environmental friendly productions attributes. In fact, although animal welfare, ensured by free razing, is statistically not significant, all consumers interviewed recognised this attribute as highly important. Apart from credence attribute, also some experience attributes which confirmed previously reported results (Van Wezemael *et al.*, 2010; Troy and Kerry, 2010; Banović *et al.*, 2009) are considered important in influencing consumers purchase behaviour. Trying to synthesise, we can emphasise that, according to our findings, experienced consumption (repeat consumption behaviour) of locally produced beef is perceived by consumers as good, safe, and fair. In this regard, the guarantee by the consortium of some of these credence attributes has proved, from the consumer point of view, very important in the qualification process of beef, showing an effect on the consumption of a higher incidence of locally produced beef. However, it is important to highlight that this perception seems influenced by some socio-demographic characteristics of the interviewees. In particular, local beef consumption is appreciated mainly by old consumers with a higher level of education and higher household monthly net income. However, further comparative research is obviously needed to overcome limits to the external validity of the results and to investigate the analytical effort proposed in this article based on a restricted number of interviewees localised in a limited geographical area. In fact, further advancement on local food perception process research should take into account also other social and cultural contexts. However, if these results will be confirmed by other studies, this way to perceive food quality can create profitable opportunities, particularly for small and medium-size producers. As a result, several initiatives in the beef sub-sector could arise to establish branding programs and voluntary certification to promote eating local, which may lead to additional profits for local beef producers.

Appendix A

The observed dependent variable y is related to the latent variable y^*, through the following observation rule:

$$y = \begin{cases} y^* \ if \ y^* < U \\ U \ if \ y^* \geq U \end{cases} \quad (A.1)$$

Where U represents the upper limit of the dependent variable. Therefore, the value of y^* is not observed when $y^* > U$.

The probability of an observation being censored is $\Pr(y^* \geq U) = \Pr(x_i'\beta + \varepsilon \geq U) = \Phi\{(U - x_i'\beta / \sigma)$ where $\Phi(\cdot)$ is the standard normal cumulative distribution function. The truncated mean or expected value of y for the uncensored observations is shown to be:

$$E(y_i \,|x_i < U) = x_i'\beta + \sigma \frac{\emptyset\{(x_i'\beta - U)/\sigma\}}{\Phi\{(U - x_i'\beta)/\sigma\}} \quad (A.2)$$

Where is the standard normal density (Cameron & Trivedi, 2005).

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