PAPER

BEEF TRADITIONAL FOOD: CONSUMER BEFORE PURCHASE PREFERENCES BASED ON QUALITY

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ABSTRACT

The aim of the paper is to study beef quality cues and attributes in Italy, comparing regions where beef is considered traditional food and regions where it is not. A quantitative research has been conducted; both a factor analysis and a cluster analysis were performed. Quality cues and/(or) attributes distinguish consumers when before purchase preferences are considered. Traceability and safety issues have become crucial in the before purchase phase. The paper suggests enhancing knowledge about contextual factors, besides quality cues and attributes, able to shape consumer preferencesand before purchase expectations to create new value offering to satisfy consumers' changing expectations concerning beef.

Keywords: beef quality, consumer perception, intrinsic quality cues, extrinsic quality cues, expected quality, traditional food

1. INTRODUCTION

Food quality has always beenand is still today, one of the most interesting topics not only for academics, but above all for consumers.
The meat quality issue has been in the spot light since 1995 (e.g., CARDELLO, 1995; GRUNERT, 1995; MOSKOWITZ, 1995), when beef attracted much attention just after the emergence of BSE (Bovine Spongiform Encephalopathy). However, over the last 22 years a number of quality standards, regulations and safety programs have been introduced, not only at a national level. The most recent one, at the European level, was introduced in 2014 focusing on traceability; an issue that had already emerged in literature (e.g., BANOVIĆ *et al.*, 2012) together with beef safety (e.g., DE BARCELLOS *et al.*, 2010; VAN WEZEMAEL *et al.*, 2010).
Given that beef is an experience product, consumers shape their before purchase expectations, building on extrinsic and intrinsic cues and when faced with choosing unbranded beef they almost always rely on price (BANOVIĆ *et al.*, 2012), even if the relationship between price and quality has not always been demonstrated (SOLOMON *et al.*, 2007).
Besides visual impressions understood as extrinsic and intrinsic cues (e.g., BELLO ACEBRÒN and CALVO DORPICO, 2000; GRUNERT *et al.*, 2004), also sensory impressions - e.g. quality attributes like taste – affect beef purchase choice as demonstrated through studies performed after consumption (e.g., BELLO ACEBRÒN and CALVO DORPICO, 2000).
However, to the best of the authors' knowledge, none of the papers on beef have considered that past sensory impressions could play a role together with extrinsic and intrinsic cues in consumer preferences and purchase choice, before purchase. Therefore, the paper aims at studying the impact of past sensory impressions as well as extrinsic and intrinsic quality cues in consumer before purchase preferences, paying attention to traceability and safety issues still not studied at length.
Therefore, two initial research questions emerge:

- *What is the role of extrinsic and intrinsic cues and of sensory impressions, based on past experience at the moment of purchase?*
- *In this context how do traceability and safety issues affect consumer preferences and choices?*

These two research questions could also be affected by other elements, like familiarity, which has already been studied by BANOVIĆ *et al.* (2010, 2012).
The third research question can be put forward as:

- *Do consumers in regions where beef is a traditional food consider the impact of traceability and safety issues differently at the moment of purchase?*

To perform the study the authors chose two different regions: Tuscany where beef is considered a traditional food and Latium, one of the nearest regions to Tuscany, but where beef is not a traditional food and the most famous PDO is "Abbacchio Romano", a type of lamb.
Protected Designation of Origins (PDOs) and Protected Geographical Indications (PGIs), have been defined by the European Union in the domain of geographic indications (EUROPEAN REGULATION 1151/2012). The European Union supports traditional quality products and the way they are produced, highlighting that "for a product name to

be protected as a PDO there must be an objective and exclusive link between the features of the product and its geographical origin" (LONDON ECONOMICS, 2008, p. 6).
Indeed, the paper also responds to the recent call for country-specific research into the beef domain, given that preferences for this food vary across different countries (ARDESHIRI and ROSE, 2017).
The paper is structured as follows. Firstly, there is a literature review focusing on papers that discuss various issues concerning food quality, meat quality and then beef quality. After the methodology section, results are illustrated and discussed. The paper ends with conclusions in which limitations, future steps of further research, as well as theoretical and managerial implications, are presented.

1.1. Literature review

1.1.1 An overview of quality types in food and meat studies

Although there are several definitions of food quality in literature, according to GRUNERT (2005), literature agrees that "quality has an objective and a subjective dimension", (p. 371). Objective quality refers to technical and physical characteristics necessary to have quality food, while subjective quality is about consumer perception of quality (GRUNERT, 1995; 2005). STEENKAMP (1990) elaborated this concept - perceived quality- as the match between product characteristics and consumer preferences. CARDELLO (1995) suggested that "food quality is a complex concept" (p. 163) where various factors converge and should be measured by both objective indices (e.g., nutritional or physicochemical characteristics) and subjective indices linked to person, place and time. OUDE OPHUIS and VAN TRIJP (1995) as well as MOSKOWITZ (1995) stated that "food quality is a multi-faceted concept" (p. 157) and has a very subjective nature because it changes from person to person. Following this through, food quality must be understood as a "human perceptual/evaluative construct" (MOSKOWITZ, 1995, p.167), therefore only consumer judgment can establish the quality of food. According to TOLOSA *et al.* (2005) quality is a "multidimensional phenomenon" (p. 419) and it can be described as a "set of attributes that must be perceived by the consumer" (p. 419). For these authors, subjective characteristics influence food quality more than objective features. In particular, GRUNERT (1995), proposed three distinct types of food quality: (1) product-oriented quality to be understood as all physical characteristics of food which can be objectively measured; (2) process-oriented quality, namely all characteristics of the food production process and (3) user-oriented quality, referring to consumer subjective quality perception. BRUNSØ *et al.* (2005), building on this classification, introduced a fourth quality type, namely "quality control", defined as "the standards a product has to meet in order to be approved for a specific quality class" (p. 84), e.g. Iso 9001 or specific standard quality beef.
Focusing on subjective quality, literature agrees to distinguish between multidimensional and hierarchical approaches (BRUNSØ *et al.*, 2005). According to the multidimensional approach, the combination of a number of quality dimensions or attributes determines the quality perception of a product (e.g. food) (VERDÙ JOVER *et al.*, 2004; BRUNSØ *et al.*, 2005). The two most important classifications in this approach are, on the one hand, the one regarding search, experience and credence characteristics (DARBY and KARNI, 1973;

NELSON, 1970, 1974) and on the other, the one proposing the separation of intrinsic quality cues from extrinsic quality cues (OLSON and JACOBY, 1972; OLSON, 1977).
According to the economic theory, search and experience are evaluated at a different time from the moment in which the consumer carries out his purchase - the first, before purchase, for example, refers to price or color; the second, after buying for example, refers to taste. Credence, instead, cannot be established either before or after purchase, because it is based on trust and faith in the product information provided - e.g. exclusiveness (OUDE OPHUIS and VAN TRIJP, 1995; GRUNERT *et al.*, 2004; BRUNSØ *et al.*, 2005; FANDOS and FLAVIÁN, 2006).
The second classification is part of the psychological theory and distinguishes between intrinsic and extrinsic quality cues. Intrinsic quality cues, according to GRUNERT *et al.* (2004), BRUNSØ *et al.* (2005), TOLOSANA *et al.* (2005) and ESPEJEL *et al.* (2007) can be understood as "part of the physical characteristics of the product"; they are "related to technical specifications, which also involve physiological characteristics" (BELLO ACEBRÓN and CALVO DOPICO, 2000, p. 230), while extrinsic quality cues refer to characteristics "related to the product, but are not physically part of it" (OUDE OPHUIS AND VAN TRIJP, 1995, p. 178). Quality cues can, therefore, be evaluated only prior to consumption.
Quality attributes, on the other hand, can only be ascertained through consumption, namely when the consumer eats the prepared meat (STEENKAMP, 1990; OPHUIS AND VAN TRIJP, 1995). Indeed, BELLO ACEBRÓN and CALVO DOPICO (2000) defined quality attributes as "functional and psychological benefits or consequences provided by the product and they are unobservable prior to consumption" (p. 231). Therefore, when purchasing, consumers base their choices on quality cues (STEENKAMP, 1989, 1990), while hoping quality attributes will meet their expectations.
CASWEELL (2000) maintained that quality perception depends on both intrinsic/extrinsic quality cues and "information environment", that is search, experience and credence quality, which are "vertically/horizontally differentiated" (p. 225). In his model Casweell integrates the two classifications of quality dimensions. This point of view is shared by BURNUÉS *et al.* (2003), who proposed a model integrating intrinsic and extrinsic quality cues with search, experience and credence quality, in order to analyze the extrinsic quality cues of beef perceived as indicators of quality in Europe.
The hierarchical approach focuses on the association "between product attributes and more abstract, more central cognitive categories such as values, which can motivate behavior and create interest for product attributes" (BRUNSØ *et al.*, 2005, p. 85). The frameworks on which the hierarchical approaches are based are the "means-end chain models" (OLSON AND REYNOLDS, 1983; GUTMAN, 1991), which link product characteristics to deeper purchasing motivation.
To clarify the distinction between multidimensional and hierarchical approaches, it is important to understand subjective quality perception. Indeed, these two approaches have played a key role in developing the Total Food Quality Model (TFQM) proposed by GRUNERT *et al.* (1997).
TFQM integrates several approaches to consumer quality perceptions (DARBY AND KARNI, 1973; FISHBEIN AND AJZEN, 1975; GUTMAN, 1982) and tries to explain, on the one hand, which factors are able to influence consumer purchase intentionand on the other, the concept of customer satisfaction as the gap between expected and experienced

quality (OLIVER, 1990; GRUNERT *et al.*, 2004; VIMISO *et al.*, 2012). In doing this the authors distinguished 'before' from 'after' purchase evaluation.
TFQM shows how quality expectations, in the 'before purchase' phase, come from the evaluation of available quality cues. According to STEENKAMP, (1990), consumers use 'cues' to determine the value of the product. Therefore, it is necessary to consider them together with quality attributes. For this reason, the authors proposed a more complex model than those used in the past, one where the distinction between quality cues and attributes is considered. An overview of food quality types identified by the above-mentioned studies is presented in Fig. 1.

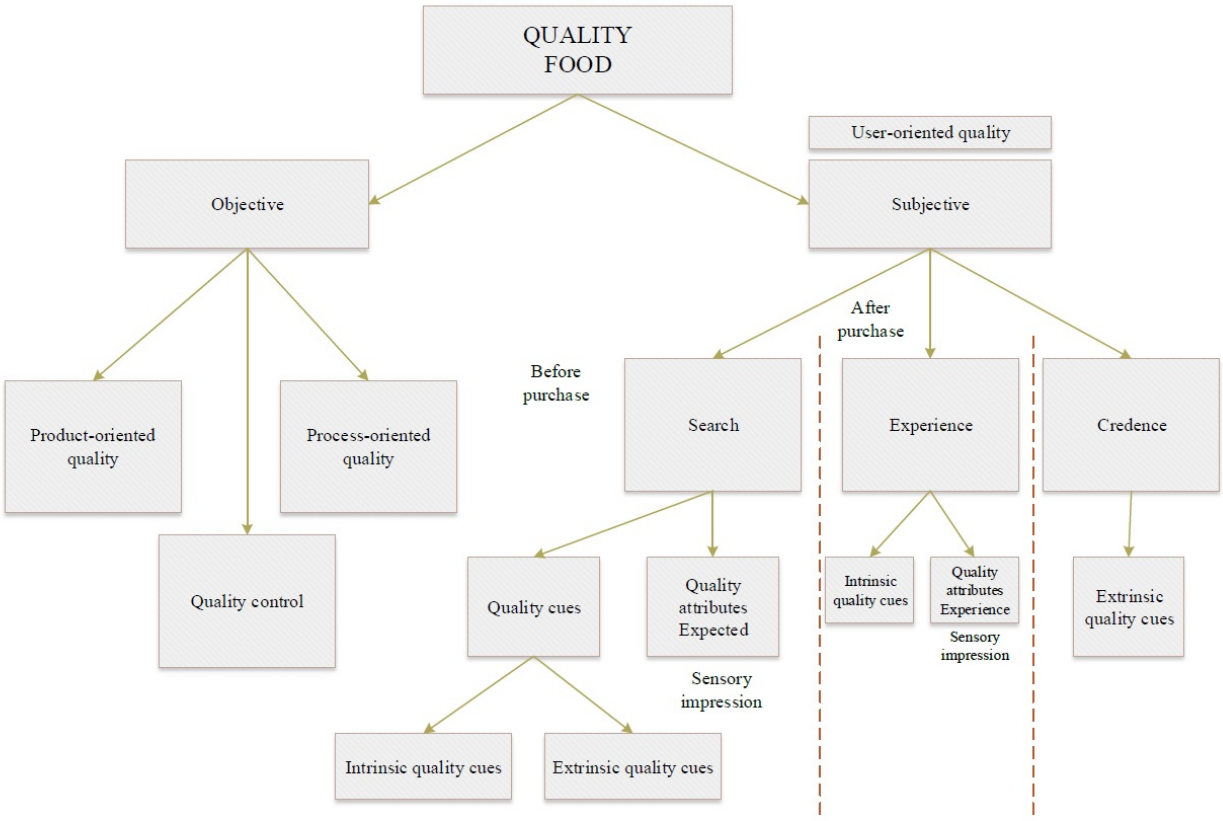


Figure 1. An overview of food quality types from the literature review.
Source: our elaboration.

1.2. Quality perception in beef consumption

Over the years, various studies have considered meat quality and especially beef quality issues. GRUNERT (1997) analyzed how consumers evaluate the quality of beef, developing research in four European countries: France, Germany, Spain and the UK. Through focus groups, the author identified the intrinsic quality cues (cut, color and fat), the extrinsic quality cues (price, origin and information on animal production) and quality

attributes (taste, tenderness, juiciness, freshness, leanness, wholesomeness, nutrition). In this study, Grunert demonstrated that some quality cues were crucial to consumer perception, even if their effect could be positive on some (e.g., on lean meat) and negative on others (e.g., price). Moreover, he observed that all quality attributes have an important impact on purchase choice and should be considered as a uni-dimensional quality concept. All the above-mentioned quality dimensions were used by the same author some years later (GRUNERT *et al.*, 2004) in order to understand how to use the feedback obtained from consumers on subjective quality perception dimensions, to develop new products in the meat sector deemed to better suit desires.

Focusing on intrinsic quality cues, color/appearance, fat and cut are the three quality dimensions most analyzed by various authors starting with GRUNERT (1997). In the same vein, MCILVEEN and BUCHANAN (2001) used these quality dimensions of intrinsic quality cues, to analyze the factors, which influence beef consumer choices. These authors demonstrated that expectations about quality play a crucial role in evaluating beef quality and that consumers combine sensory (intrinsic) properties – colour, cut and fat in this study-, with extrinsic factors like place of purchase, country of origin, price, brandand quality attributes like appearance, texture, flavour and leanness, to predict and evaluate beef quality.

BRUNSØ *et al.* (2005) also used visual stimuli - colour, fat and cut - in order to understand Danish consumer meat quality perception, demonstrating that consumers are very sensitive to visual stimuli even if this might involve dissatisfaction at the consumption moment. For this reason, BRUNSØ *et al.*, (2005) also stressed the need to educate the consumer in order to improve his consumption experience. For this sensory analysis, the following quality factors were used: cut, fat and colour (three intrinsic quality cues) and tenderness, juiciness, good taste, wholesomeness, nutritional value, freshness, leanness (the latter being quality attribute expectations).

The same quality dimensions (intrinsic quality cues and quality attributes) - with the addition of safety - were used by BANOVIĆ *et al.* (2009) in order to study how Portuguese consumers perceive beef quality. However, in their research, authors also focused on extrinsic quality cues. They also studied the relationship between intrinsic and extrinsic quality cues (price, origin and brand) and how these features were used by consumers to shape their quality perception at the moment of purchase. Results showed that brand is the predominant extrinsic quality cueand that experienced eating quality has a crucial role in future purchase intentions.

"Differences in the consumers' quality perception of national branded, national store brandedand imported store branded beef" were studied by BANOVIĆ *et al.* (2010, p. 54). They observed that consumers perceived the national branded beef as better under all quality cues and aspects in respect to all other branded beef. The same authors in 2012, published another paper focusing on how intrinsic and extrinsic cues affected beef quality consumer perception, also considering different levels of consumer familiarity with a particular beef product. Results demonstrated that color is the intrinsic quality cue most used to evaluate quality when there is high-familiarity with beef. On the contrary, for consumers not familiar with beef, brand plays a crucial role. BORGOGNO *et al.* (2015) also focused on this topic; they compared "consumer's liking and perception of meat quality attributes as a function of their familiarity and involvement with fresh meat" (p. 139) and results showed that, regardless of familiarity level, consumers assign great importance to the visual appearance of meat. Brand in the beef sector is very important because in this

domain meat is mostly sold unbranded. For this reason, according to BREDAHL (2003), analyzing "consumers' quality perception is particularly difficult" (p. 65). The author proposed further research be developed on this topic in order to improve knowledge about the formation of perceived quality and to understand how consumers use and combine quality cues, focusing on brand information. This author demonstrated that brand, as an extrinsic quality cue, is the basis for evaluating both expected eating quality and expected health quality. Intrinsic quality cues identified by BREDAHL (2003) were fat, color, meat juice and cut, while extrinsic quality cues were "brand name, price, cardboard tray, product label, package sleeve, information leaflet, recipes, promotion boards and the information scanner" (p. 69). Finally, quality attributes studied "nutritional value, healthiness, freshness, leanness, tenderness, taste and juiciness" (BREDAHL, 2003, p. 69). Research on the role of the brand in consumer quality perception, also demonstrated that consumers associate safety (quality attributes) with brand, in particular when there is no familiarity with beef. Concerning the safety topic, DE CARLOS *et al.* (2005) performed a qualitative study on the perception of beef in Spain. They observed that the most significant factors affecting quality perception were color, fat content - intrinsic quality cues - and price - extrinsic quality cue - among others (Table 1 and 2). Quite surprisingly, the study highlighted that Spanish consumers, even if aware of the controls carried out by various beef authorities, prefer not to rely on them.

According to BERNUÉNS *et al.* (2003), for some consumer groups, an indicator of safety and nutritious/healthy meat is animal feed and not origin. In their research, the authors focused on different extrinsic quality cues (origin/region of production, animal breed, environmentally friendly, processing/packaging, animal welfare storage, animal feeding) in order to study the role of this extrinsic quality cue on the willingness of consumers to pay for beef, developing their research over five European regions. They conclude identifying clusters of consumers according to the importance of extrinsic quality cues. The high level of importance given to animal welfare by consumers, as a dimension of extrinsic quality, has also been demonstrated by LAGERKVIST *et al.* (2014). The authors analyzed how food labels and packaging information on place of origin influence consumer purchasing decisions. LAGERKVIST *et al.* (2014) studied the price-quality trade-offs issue, highlighting that consumers base their decisions on price when they lack information about intrinsic quality cues. Also MERLINO *et al.* (2018) proved that price, for Italian consumers, is the most important factor in meat purchasing. However, results showed that Italian consumers are also sensitive to "animal welfare" which plays an important role in the choice of buying meat.

According to VERBEKE and WARD (2006), information cues on labels in the beef sector are very important because they help consumers orient their purchasing choices. In particular, the authors developed a study in Belgium, in order to understand which information cues on beef labels greater influenced consumers and to evaluate the impact of a campaign aimed at informing consumers about beef traceability. In this case VERBEKE and WARD (2006) focused only on extrinsic quality cues, without deepening the role of intrinsic quality cues or quality attributes on consumer purchase decisions, unlike BELLO ACEBRÓN and CALVO DOPICO (2000) who developed a study in Spain demonstrating that consumers shape their expectations about beef quality building on both intrinsic cues (e.g., color and fat) and extrinsic cues (e.g., price and origin of animal). These authors also observed that quality attributes, evaluated during consumption, are: taste, tenderness and juiciness. In particular, these authors studied the relationship

between expected quality and perceived quality at the moment of cooking. RESANO *et al.*, (2018) focused on consumer preferences of veal attributes; authors proved that regional origin and health information play a stronger role than guaranteed tenderness at the moment of purchasing.
To analyze consumer meat quality perceptions several authors used the TFQM model. In particular VIMISO *et al.* (2012) applied the TFQM model in order to compare rural consumer meat quality perceptions, measured through intrinsic and extrinsic quality cues, with meat trader quality perceptions. Quality dimensions used in this research were color and fat - intrinsic quality cues-and place of slaughter, packaging, beef class and price - extrinsic quality cues. Quality attributes considered were: juiciness, tenderness, freshness, leanness.
SAEED (2013) and SAEED and GRUNERT (2014), through the application of the TFQM model, focused on beef production processes. SAEED (2013) used the TFQM in order to analyze the change in consumer quality perception concerning four new processed beef products, both in the pre and post consumption phase. Quality cues selected for this study were: beef color, fat, appearance, cut, trim and ingredients. Taste, freshness, nutrition, juiciness, wholesomeness were considered among the quality attributes and evaluated at the point of beef consumption, in order to study consumer perceptions. SAEED and GRUNERT (2014), using TFQM, focused on four different new beef product processes and underlined that cue evaluations as well as "expected/experienced quality and purchase motive fulfillment" affect purchase intention but act differently before and after trial (p. 451). They investigated quality cues before and after trial like appearance, color, fat, etc.; expected quality and experienced quality like taste, freshness, juiciness, etc.; purchase motives before and after trial and, finally, purchase intention before and after purchase.
The studies of beef product processes are very important because according to RESURRECCION (2003) "the development of low-fat products is another strategy to increase the consumption of beef" (p. 13). Indeed, the author studied factors influencing consumer purchase behavior, suggesting that changes in consumer preferences depend on factors such as health concerns, change in demographics, need for convenience, changes in the distribution of meat, as well as price.
COLLE *et al.*, (2016) developed a technical study to determine the influence of post-fabrication ageing on beef quality characteristics and consumer sensory perceptions of biceps femoris and semi-membranous steaks. Quality attributes selected for this study were: tenderness, juiciness and flavor.
Based on previous research of consumer decision-making about red meat, from which the amount and type of visual fat emerged as a major factor in consumer choice (i.e., BANOVIĆ *et al.*, 2012, BANOVIĆ *et al.*, 2009, BANOVIĆ *et al.*, 2010, BRUNSØ *et al.*, 2005), BANOVIĆ *et al.* (2016) focused on the effect of fat content on visual attention and on the choice of red meat, as well as on gender differences, developing a study conducted on 105 Portuguese meat consumers. Results show that consumers pay more attention and more often choose meat products with lower fat content, particularly if they are female. The relationship between meat color and fat and consumer perception was also studied by RISTIĆ *et al.* (2017) who develop a sensorial analysis in order to evaluate consumer attitudes towards sensory properties of chicken, royal and beef salami, all meat products from Zlatiborac Meat Company. The authors proved that consumers pay great attention to these intrinsic quality cues; especially older consumers, perhaps because they are more aware of health aspects related to the food products they purchase. According to

SUBBARAJ *et al*. (2016), meat color is one of the cues available for consumers to gauge overall meat quality and wholesomeness; the authors, performing a technical study based on hydrophilic interaction liquid chromatography–mass spectrometry (HILIC–MS), were able to state that "colour stability of meat is determined by several factors both inherent to the animal and post-slaughter conditions, including ageing, storage/packaging and display times" (SUBBARAJ *et al*., 2016, p. 163).
Finally, HENCHION *et al*., (2017) developed a systematic review in order to determine the relative importance of beef quality attributes from a consumer perspective, considering search, experience and credence quality attributes. The aim of the study was to provide relevant information that may be considered in future iterations of quality assurance schemes, to increase consumer satisfaction and, potentially, to increase returns to industry. Tables 1-3 show quality dimensions studied by the above-mentioned authors in order to analyze and understand consumer perception of beef.

Table 1. Intrinsic quality cues.

Author	Type of meat analyzed	Country	Intrinsic quality cues					
			Colour/Appearance	Fat	Cut	Meat juice	Trimming	Marbling
Grunert, (1997)	Beef	France, Germany, Spain, UK	X	X	X			
Acebroen & Calvo Dopico (2000)	Beef	Spain	X	X				
McIlveen and Buchanan, (2001)	Beef	Ireland	X	X	X			
Bredahl (2003)	Beef	Denmark	X	X		X	X	
Grunert *et al*., (2004)	Beef and pork	France, Germany, Spain, UK	X	X	X			
Resurreccion, (2004)	Beef	France, Germany, Spain, Uk and USA	X	X				
Brunsø *et al*., (2005)	Beef	Danish	X	X	X			
de Carlos *et al*., (2005)	Beef	Spain	X	X	X			
Banović *et al*., (2009)	Beef	Portugal	X	X	X			
Banović *et al*., (2010)	Beef	Portugal, Brazil	X	X	X			
Banović *et al*., (2012)	Beef	Portugal	X	X	X			
Vimiso *et al*., (2012)	Beef	South Africa	X	X				
Saeed *et al*., (2013)	Beef	Denmark	X	X	X			
Borgogno *et al*., (2014)	Beef	Italy	X	X				X
Saeed and Grunert (2014)	Beef	Denmark	X	X				
Banović *et al*., (2016)	Beef	Portugal		X				
Colle *et al*., (2016)	Beef	Idaho - USA	X					
Subbaraj *et al*., (2016)	Beef	Southland, New Zealand	X					
Henchion *et al*., (2017)	Beef		X	X				
Merlino *et al*., (2018)	Beef	Italy	X					

Source: our elaboration.

Table 2. Extrinsic quality cues.

Author	Type of meat analyzed	Country	Extrinsic quality cues												
			Price	Origin/Quality certification	Promotion	Label Information/ Information on animal production	Place of Purchase	Brand	Butcher recom-mendation	Beef class	Store image	Storage	Package/ Presentation	Animal welfare	Recipes
Grunert, (1997)	Beef	France, Germany, Spain, UK	X	X		X									
Acebroen & Calvo Dopico (2000)	Beef	Spain	X	X	X						X		X		
McIlveen and Buchanan, (2001)	Beef	Ireland	X	X			X	X							
Bernués *et al.*, (2003)	Beef	England, Italy, France, Scotland and Spain		X				X		X		X	X		
Bredahl (2003)	Beef	Denmark	X	X	X	X		X					X*		X
Grunert *et al.*, (2004)	Beef and pork	France, Germany, Spain, UK	X	X		X									
Resurreccio n, (2004)	Beef	France, Germany, Spain, Uk and USA	X												
de Carlos *et al.*, (2005)	Beef	Spain	X	X					X		X	X			X

Verbeke and Ward (2006)	Beef	Belgium		X		X									
Banović *et al.*, (2009)	Beef	Portugal	X	X				X							
Banović *et al.*, (2010)	Beef	Portugal, Brazil	X	X		X		X					X		
Banović *et al.*, (2012)	Beef	Portugal	X	X				X							
Borgogno *et al.*, (2014)	Beef	Italy	X	X		X		X		X			X	X	X
Vimiso *et al.*, (2012)	Beef	South Africa	X			X				X			X		
Lagerkvist *et al.* (2014)	Beef	Swedish	X	X		X		X							
Henchion *et al.* (2017)	Beef		X	X		X	X	X					X		
Merlino *et al.*, (2018)	Beef	Italy	X	X		X		X		X				X	
Resano *et al.*, (2018)	Beef	Spain	X	X		X									

Source: our elaboration.
* Cardboard tray, Package sleeve.

Table 3. Quality attributes expectations/experience.

Author	Type of meat analyzed	Country	Quality attributes								
			Taste/Flavour	Tenderness	Juiciness	Wholesomeness/Healthiness	Nutrition value	Leanness	Safety	Freshness	Smell
Grunert, (1997)	Beef	France, Germany, Spain, UK	X	X	X	X	X	X		X	
Acebroen & Calvo Dopico (2000)	Beef	Spain	X	X	X						
McIlveen and Buchanan, (2001)	Beef	Ireland	X	X	X			X			

Bredahl (2003)	Beef	Denmark	X	X	X	X	X	X		X		
Grunert *et al.*, (2004)	Beef and pork	France, Germany, Spain, UK	X	X	X	X	X	X		X		
Resurreccion, (2004)	Beef	France, Germany, Spain, Uk and USA	X	X	X	X	X		X			
Brunsø *et al.*, (2005)	Beef	Danish	X	X	X	X	X	X		X		
Banović *et al.*, (2009)	Beef	Portugal	X	X	X	X	X	X	X	X		
Banović *et al.*, (2010)	Beef	Portugal, Brazil	X	X	X	X	X		X			
Banović *et al.*, (2012)	Beef	Portugal	X	X	X	X	X		X			
Vimiso *et al.*, (2012)	Beef	South Africa		X	X			X		X	X	
Saeed *et al.*, (2013)	Beef	Denmark	X		X	X	X			X		
Borgogno *et al.*, (2014)	Beef	Italy					X		X			
Saeed and Grunert (2014)	Beef	Denmark	X		X	X	X			X		
Henchion *et al.*, (2017)	Beef		X	X	X	X	X*		X*			
Merlino *et al.*, (2018)	Beef	Italy	X	X			X		X			
Resano *et al.*, (2018)	Beef	Spain		X								

Source: our elaboration.
Note: * HENCHION *et al.*, (2017) classify Nutrition value and Safety as Credence attributes together with Origin, Animal welfare, Production system/feeding, Environmental issues, Traceability, Processing technologies (ageing, irradiation, halal/kosher) and Breed.

2. MATERIAL AND METHODS

2.1. Questionnaire and data collection

Based on the study of ESPEJEL *et al.* (2007), a questionnaire was prepared to investigate the relationship between intrinsic quality cues, extrinsic quality cues, expected quality of beef and customer behavior.
The questionnaire was divided into three different areas of analysis: (i) perceived quality cues (extrinsic and intrinsic) (Table 4), (ii) evaluation of expected quality (Table 4), (iii) customer profile: containing information on socio-demographic features (Table 9). Dimensions of quality cues and expected quality attributes were drawn from the literature review.
The Likert measurement scale was used to measure consumer perception, with a score assigned to the respondents between 1 and 6, ranging from 'strongly disagree' (scoring value 1) to 'strongly agree' (scoring value 6); an even scale was chosen in order to avoid central tendency bias of the responses (LIKERT, 1932; MATELL AND JACOBY, 1971; BERNUÉS *et al.*, 2012; SILVESTRI *et al.*, 2018), To measure customer before purchase preferences and expectations, three types of questions were formulated: two single choice questions, three dichotomic questions and two questions measured on a Likert scale 1-6.
As the aim of the research was also to understand how the perception of beef quality changes from one region to another and therefore if the traditional food issue could affect consumer preferences and purchase choices, the study was performed in two Central Italian regions that have the closest percentage of beef production: Latium 35,9% and Tuscany 32,2% (ISMEA, 2016). Tuscany was selected as it is the only Italian region where beef is part of the traditional cuisine (MIELE and MURDOCH, 2002). In particular, from this region Grosseto and Orbetello were selected, both pertaining to Grosseto Province, which is the administrative center where beef livestock is the most important of all Central Italian Provinces (ISTAT, 2010; ISMEA, 2016). In Latium, Viterbo was selected as the nearest Province to Tuscany and the Province where beef livestock is less important than in other provinces in Latiumand Rome where beef livestock is the most important in the region, but the PDO is "Abbacchio Romano" (ISTAT, 2010; http://ec.europa.eu/).
The data collection was performed thus: Viterbo (Latium) June, 17-19, 2016; Grosseto (Tuscany) June, 24-26, 2016; Rome (Latium) July, 1-3, 2016; Orbetello (Tuscany) July, 8-10, 2016. To ensure both the homogeneity of data collection conditions within four hypermarkets and the possibility of contacting the most heterogeneous consumers – also working people and families - questionnaires were collected at weekends. Consumers were interviewed at the meat counter of the hypermarket once they had picked up a beef package. The difficulty in identifying the meat consumers led, as it usually does in market research activities, to the adoption of a no probabilistic model, in particular of a random sampling (BRACALENTE *ET AL.*, 2009, SAEED *et al.*, 2013). The sample analyzed was composed of 447 individuals.
The data collected was analyzed using the statistic program "STATA 12 Data Analysis and Statistical Software" (www.stata.com).

2.2. Factor analysis and cluster analysis

Data presented in Table 4 shows that all quality dimensions significantly influence preferences and beef purchase decisions. In particular, among the intrinsic quality cues, the most important attribute is color (average value of 5.40); the extrinsic quality cues are affected by price (average value of 5.85) and quality certification (average value of 5.52). Expected quality is homogeneously affected by all attributes. Safety and juiciness are the only quality attributes that present a lower average value (Safety average value of 3.99; Juiciness average value of 4.64)

Cronbach α was used to test internal consistency for all items under respective variables (NAMUKASA, 2013). Following Hair at al. (2006) who stated that Cronbach α coefficient over 0.6 is adequate for basic research, it is possible to argue that the sample of this study shows good internal consistency. Also performing the Kaiser-Meyer-Olkin (KMO) test whose result must exceed the 0.5 limit (KAISER, 1974; HAIR *et al.*, 2006; SANTOURIDIS AND TRIVELLAS, 2010), the sample was found appropriate to perform the factor analysis. Finally, the correlation test was used to verify whether or not the observed variables contain misleading redundancies or make the results insignificant.

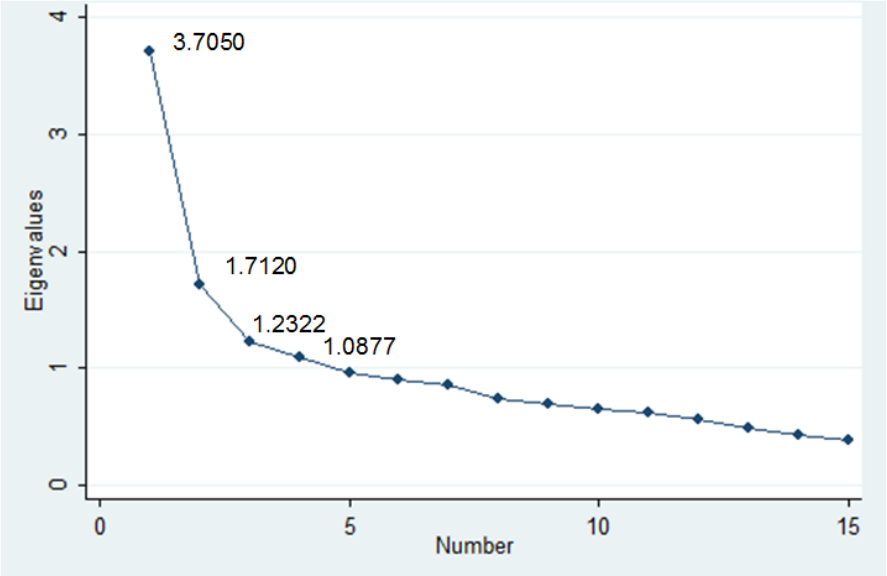
Table 4. Descriptive statistics of quality dimensions.

Measures	Items	Variable	Obs	Mean	Std. Dev.	Min	Max	Alpha	KMO
Intrinsic quality cues	Cut	IQ1	447	4.67	1.47	1	6	0.696	0.780
	Color	IQ2	447	5.40	1.06	1	6		0.811
	Fat	IQ3	447	4.79	1.33	1	6		0.823
Extrinsic quality cues	Origin	EQ1	447	4.67	1.48	1	6	0.667	0.744
	Price	EQ2	447	5.85	0.53	2	6		0.623
	Quality certification	EQ3	447	5.52	0.89	1	6		0.681
	Brand	EQ4	447	5.44	1.03	1	6		0.641
Expected quality attributes	Nutritional value	EXQ1	447	5.57	1.01	1	6	0.612	0.844
	Freshness	EXQ2	447	5.23	1.08	1	6		0.845
	Taste	EXQ3	447	5.53	0.85	1	6		0.882
	Tenderness	EXQ5	447	5.23	1.34	1	6		0.806
	Smell	EXQ6	447	5.66	0.92	1	6		0.833
	Juiciness	EXQ7	447	4.64	1.36	1	6		0.789
	Wholesomeness/Healthiness	EXQ8	447	5.57	1.01	1	6		0.782
	Safety	EXQ9	447	3.99	1.75	1	6		0.716
		Overall						0.746	0.790

Source: our elaboration on the data set.

In order to determine the number of the most important factors, the screen plots tool introduced by Cattell (1966) was used. Fig. 2 shows that the first four factors are the only ones with eigenvalues greater than 1.

Figure 2. Screen plot of eigenvalues after factor analysis.



Source: our elaboration.

Table 5 shows orthogonal Varimax rotation of the factors where the first four have eigenvalues greater than 1 and also encompass 51.58% of the information contained in the original data set.

Table 5. Rotation: orthogonal Varimax (Kaiser off).

Factor	Variance	Difference	Proportion	Cumulative
Factor 1	2.5322	0.4394	0.1688	0.1688
Factor 2	2.0928	0.2172	0.1395	0.3083
Factor 3	1.8756	0.6393	0.1250	0.4334
Factor 4	1.2363		0.0824	0.5158

Source: our elaboration on the data set; Number of obs 447; Retained factors 4.

From the results obtained from the joint use of the two above illustrated analytical tools, the first four factors were considered to identify the new variables.

Factor interpretation was achieved by considering the so-called saturation matrix (Table 6) where correlation between original variables and factors were identified.

Table 6. Saturation matrix (factor loadings).

New Variables	Measures	Items	Variable	Factor 1	Factor 2	Factor 3	Factor 4	Uniqueness
Beef quality features – FA1	Intrinsic quality cues	Color	IQ2	**0.6457**	0.2420	-0.0077	0.1189	0.5104
		Fat	IQ3	**0.5069**	0.1431	-0.0077	0.1674	0.6945
	Quality expected attributes	Freshness	EXQ2	**0.7152**	0.0449	0.1304	0.0066	0.4694
		Taste	EXQ3	**0.6020**	0.2464	0.0132	0.0346	0.5755
		Tenderness	EXQ5	**0.5764**	0.2474	0.1252	-0.0191	0.5906
		Smell	EXQ6	**0.6871**	0.1779	0.0312	0.0066	0.4952
Flavor & Healthiness – FA2	Intrinsic quality cues	Cut	IQ1	0.0792	**0.5961**	0.1815	0.2020	0.5646
	Quality expected attributes	Nutritional value	EXQ1	0.0093	**0.5929**	0.2193	0.1985	0.5609
		Juiciness	EXQ7	0.2954	**0.7237**	-0.0277	-0.1143	0.3751
		Wholesomeness/Healthiness	EXQ8	0.2429	**0.7203**	0.1169	-0.0723	0.4033
Safety & Traceability – FA3	Extrinsic quality cues	Origin	EQ1	0.0775	0.2822	**0.7074**	-0.0060	0.4140
		Quality Certification	EQ3	0.0565	0.0700	**0.8034**	0.0198	0.3460
	Quality expected attributes	Safety	EXQ9	-0.0003	-0.0473	**0.6513**	-0.0325	0.5725
Price & Brand – FA4	Extrinsic quality cues	Price	EQ2	-0.0108	0.0749	-0.1864	**0.7960**	0.3259
		Brand	EQ4	0.1347	-0.1279	0.3760	**0.6774**	0.3653

Source: our elaboration on the data set.

Table 6 shows that factor1 synthesizes the variables related to the attributes of intrinsic quality cues (like Color and Fat) and expected quality (like Freshness, Taste, Tenderness and Smell). Factor 2 synthesizes the variables related to the attributes of intrinsic quality cues (like Cut) and expected quality (like Nutritional value, Juiciness, Wholesomeness/Healthiness). Factor 3 synthesizes the variables related to the attributes of extrinsic quality cues (like Origin and Quality Certification) and expected quality (like Safety) and finally factor 4 synthesizes the variables related to the attributes of extrinsic quality cues (like Price and Brand). Through factor analysis, the number of variables was reduced from 15 to 4. This result highlights that consumers do not have a clear idea of how literature classifies the different quality dimensions of meat.
For research purposes the hierarchical method of Ward (FABBRIS, 1997; DAHL AND NÆS, 2004; ANNUNZIATA AND VECCHIO, 2013) was used and the number of groups was determined by inspecting the dendrogram.

Using the information derived by the Calinski/Harabasz indicator (Table 7) together with the dendrogram analysis, four groups were identified.

Table 7. Calinski/Harabasz indicator.

Number of clusters	Calinski/ Harabasz
2	76.06
3	86.52
4	**98.83**
5	94.23
6	91.79
7	88.22

Source: our elaboration on direct survey

Table 8 shows the four meat consumer groups related to the new variables of quality dimensions. On the basis of the correlation link intensity it is possible to define the characteristics of the four clusters.

Table 8. Cluster analysis in relation to new factors of quality – correlation link intensity.

Cluster	FA1	FA2	FA3	FA4
Cluster 1	-1.971	-0.409	-0.392	0.184
Cluster 2	**0.577**	0.038	-1.763	0.335
Cluster 3	0.189	**0.284**	0.323	-1.184
Cluster 4	0.231	-0.045	**0.390**	**0.420**
Total	-1.57E-10	5.82E-10	-1.87E-09	-1.42E-09

Source: our elaboration on direct survey.

Cluster 1 seems to be indifferent to all studied quality dimensions of beef, unlike the other three clusters. Indeed Cluster 2 is characterized by consumers focused on Beef quality features (FA1), Cut, Nutritional value, Juiciness, Wholesomeness/Healthiness (FA2) are essential for Cluster 3, while Safety and Traceability (FA3) and Price and Brand (FA4) are fundamental to Cluster 4. In order to validate the segmentation into 4 clusters, confirmatory analysis was developed.
The statistical significance of socio-demographic variables (categorical variables) was validated through the test study of Pearson Chi-square (ADANACIOGLU AND ALBAYRAM, 2012), while the statistical significance of numeric variables was validated through the study of Variance (VERMEIR AND VERBEKE, 2008; YADAVALLI AND JONES, 2014).

The largest group is Cluster 4, 51.23% followed by 23.71% of Cluster 3, while Cluster 1 and Cluster 2 are the smallest ones (Cluster 1 represents 12.08% of the sample and Cluster 2 12.98%).
Cluster 1 is mainly composed of young men, aged between 20-29 and 30-39. They are students, workers, entrepreneurs and teachers, residing mostly in Tuscany (Grosseto) and Latium (Viterbo province). They purchase beef every day or one day a weekand they do not read the traceability label because they stated they don't understand its meaning. For this reason, most Cluster 1 consumers are not willing to pay a higher price for a better beef quality system. Those who are ready to pay more declared that they would be ready to pay up to a 10% increase on the market price to have a better beef quality system. For cluster 1 consumers, quality certification is synonyms with safety (scores assigned on the Likert-scale from 3 to 5) and media information affects their perception of beef quality (scores assigned on the Likert-scale from 4 to 6).
Cluster 2 consumers were focused on Beef quality features (FA1). This represents 12.98% of the sample and it consists mainly of young men aged between 20-29 and 30-39. They are students, employees, freelancers and artisans, resident in Tuscany (Grosseto) and Latium (Viterbo). They purchase beef two or three times of week. Like cluster 1 consumers, they do not read the traceability label because they stated they don't understand it. They are not willing to pay a higher price for a better beef quality system. Those who are ready to pay more declared that they are ready to pay up to a 10% increase on the market price to have a better beef quality system. For cluster 2 consumers quality certification is not synonyms with safety (scores assigned on the Likert-scale from 1 to 2) and media information affects their perception of beef quality (scores assigned on the Likert-scale from 3 to 5).
Cluster 3 is composed of women and men aged between 20-29, 40-49 and 50-59 years, students, entrepreneurs, freelancers and unemployed resident in Tuscany (Grosseto province) and Latium (Roma). Consumers of Cluster 3 focus their attention on the traceability label and quality certification too and are willing to pay up to 10% more than the beef market price in order to have a better quality system. Some cluster 3 consumers consider beef quality certifications as synonymous with safety (scores assigned on the Likert-scale 4) while others do not (scores assigned on the Likert-scale 1). Some cluster 3 consumers claimed to be greatly influenced by media information (scores assigned on the Likert-scale 6) while others said the opposite (scores assigned on the Likert-scale). Finally, they buy beef two or three times a week, more than once a month or less than once a month.
Finally, Cluster 4 is the largest group (51.23% of simple) and it is composed of women aged between 50-59 and over 60, predominantly housewives, teachers and pensioners living in Tuscany (Grosseto province). For them the traceability label and quality certification of beef are essential factors in making their purchase decision. However, they are willing to pay up to 5% more than the current beef market price in order to have a better quality system. Finally, they consider beef quality certifications as synonymous with safety (scores assigned on the Likert-scale from 5 to 6) and they buy beef every day and once a week. Some of them are greatly influenced by media information (scores assigned on the Likert-scale 5) while others stated that they are not influenced by such information at all (scores assigned on the Likert-scale from 1 to 2) (Table 9).

Table 9. Socio-demographic characteristics and purchase intention of the meat consumers of the four clusters.

Socio-demographic behavioral variables	Sample (n)		Cluster 1 (n= 54; 12.08%)		Cluster 2 (n= 58;12.98%)		Cluster 3 (n= 106; 23.71%)		Cluster 4 (n= 229, 51.23%)	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Gender										
Male	142	31.77	23	42.59	21	36.21	34	32.08	64	27.95
Female	305	68.23	31	57.41	37	63.79	72	67.92	165	72.05
Total	447	100	54	100	58	100	106	100	229	100
Age Group										
20-29	68	15.21	14	25.93	11	18.97	17	16.04	26	11.35
30-39	51	11.41	11	20.37	12	20.69	6	5.66	22	9.61
40-49	63	14.09	4	7.41	8	13.79	23	21.7	28	12.23
50-59	107	23.94	7	12.96	9	15.52	32	30.19	59	25.76
≥60	158	35.35	18	33.33	18	31.03	28	26.42	94	41.05
Total	447	100	54	100	58	100	106	100	229	100
Professional category										
Student	43	9.62	7	12.96	9	15.52	12	11.32	15	6.55
Employee	82	18.34	9	16.67	16	27.59	19	17.92	38	16.59
Worker	32	7.16	6	11.11	4	6.9	7	6.6	15	6.55
Housewife	69	15.44	6	11.11	7	12.07	14	13.21	42	18.34
Entrepreneur	16	3.58	4	7.41	2	3.45	6	5.66	4	1.75
Freelance	41	9.17	4	7.41	6	10.34	18	16.98	13	5.68
Teacher	23	5.15	3	5.56	2	3.45	5	4.72	13	5.68
Pensioner	104	23.27	12	22.22	8	13.79	20	18.87	64	27.95
Artisan	4	0.89	0	0	2	3.45	1	0.94	1	0.44
Unemployed	12	2.68	1	1.85	1	1.72	3	2.83	7	3.06
Other	21	4.7	2	3.7	1	1.72	1	0.94	17	7.42
Total	447	100	54	100	58	100	106	100	229	100
Residence										
Viterbo	70	15.66	7	12.96	18	31.03	14	13.21	31	13.54
Province of Viterbo	70	15.66	13	24.07	8	13.79	14	13.21	35	15.28
Civitavecchia	62	13.87	5	9.26	8	13.79	17	16.04	32	13.97
Grosseto	101	22.6	13	24.07	14	24.14	22	20.75	52	22.71
Province of Grosseto	39	8.72	4	7.41	5	8.62	14	13.21	16	6.99
Orbetello	43	9.62	5	9.26	1	1.72	6	5.66	31	13.54
Other provinces of Tuscany	62	13.87	7	12.96	4	6.9	19	17.92	32	13.97
Total	447	100	54	100	58	100	106	100	229	100

Purchase Frequency										
Everyday	22	4.93	6	11.32	0	0	4	3.81	12	5.29
2-3 times a week	220	48.43	25	45.28	32	54.39	54	50.48	109	47.14
1 time per week	163	37.22	20	37.74	20	35.09	36	34.29	87	38.33
2-3 times a month	38	8.52	3	5.66	5	8.77	10	9.52	20	8.81
Less than once a month	4	0.9	0	0	1	1.75	2	1.9	1	0.44
Total	447	100	54	100	58	100	106	100	229	100
Knowledge the traceability label										
Yes	368	82.33	42	77.78	22	55.17	96	85.85	209	88.65
No	79	17.67	12	22.22	36	44.83	10	14.15	19	11.35
Total	447	100	54	100	58	100	106	100	228	100
Read the traceability label										
Yes	370	82.74	42	77.78	22	37.93	96	90.57	210	91.67
No	77	17.26	12	22.22	36	62.07	10	9.43	19	8.33
Total	447	100	54	100	58	100	106	100	229	100
Willingness to pay a higher price for a better meat quality system										
Yes	392	87.7	42	77.78	43	74.14	102	96.23	205	89.52
No	55	12.3	12	22.22	15	25.86	4	3.77	24	10.48
Total	447	100	54	100	58	100	106	100	229	100
How much more										
5% more than the current market price	191	48.6	21	48.84	21	48.84	40	39.22	109	53.17
Up to 10% more than the current market price	130	33.08	16	37.21	15	34.88	32	31.37	67	32.68
Over 10% more than the current market price	72	18.32	6	13.95	7	16.28	30	29.41	29	14.15
Total	393	100	43	100	43	100	102	100	205	100
How much quality labels are safety synonyms for consumers										
1= In no way	52	11.63	2	3.7	10	17.24	17	16.04	23	10.04
2	23	5.15	4	7.41	7	12.07	6	5.66	6	2.62
3	48	10.74	10	18.52	8	13.79	12	11.32	18	7.86
4	105	23.49	16	29.63	13	22.41	29	27.36	47	20.52
5	146	32.66	18	33.33	15	25.86	28	26.42	85	37.12
6=Very much	73	16.33	4	7.41	5	8.62	14	13.21	50	21.83
Total	447	100	54	100	58	100	106	100	229	100

How much media information influences their meat purchasing choices										
1= In no way	227	50.78	22	40.74	26	43.86	62	58.1	121	52.42
2	32	7.16	4	7.41	4	7.02	5	4.76	19	8.37
3	44	9.84	4	7.41	8	14.04	9	8.57	22	9.69
4	57	12.75	11	20.37	11	19.3	11	10.48	22	9.69
5	52	11.63	8	14.81	7	12.28	8	7.62	28	12.33
6=Very much	35	7.83	5	9.26	2	3.51	11	10.48	17	7.49
Total	447	100	54	100	58	100	106	100	229	100

Source: our elaboration.

3. DISCUSSION

The above results help to answer the research questions on which the paper is built.
Factor analysis helps understand what the relationships are between extrinsic cues, intrinsic cues and expected quality attributes – sensory impressions based on past experience-, therefore answer the first research question:

- *What is the role of extrinsic and intrinsic cues as well as sensory impressions based on past experience at the moment of purchase?*

From Table 6 it is clear that extrinsic quality cues are linked to safety which is an expected quality attribute, while intrinsic quality cues are linked to all other expected quality attributes, namely freshness, taste, tenderness, smell.
These results are in line with previous studies. In particular, origin, safety and quality certifications – e.g. quality labels – (Cluster 4) have already been considered as quality cues important to determine consumer preferences and choices before beef is purchased (e.g. GRUNERT, 2005). BRUNSØ *et al.* (2005) also highlight the importance of quality controls, stating that this is the third dimension of quality. Instead, GRUNERT (2005) states that information available about "breed, age of animaland slaughtering date are predictive" of taste and tenderness, but "few consumers feel confident in using them" (p. 376). Cluster 4 represents 51.23% of the entire sample. It is made up of older women, aged from 50 to over 60. Consumers grouped in Cluster 4 consider beef traceability as well as quality certifications of paramount importance and predictive of beef safety. Moreover, for these consumers price and brand are the most important features to signal quality as also suggested by Grunert *et al.* (2004). Price has long been studied in beef quality literature, almost together with brand (BELLO ACEBRÓN AND CALVO DOPICO, 2000; BREDAHL, 2003; GRUNERT *et al.*, 2004; GRUNERT, 2005; TOLOSANA *et al.*, 2005; BANOVIĆ *et al L.*, 2010; BANOVIĆ *et al.*, 2012). Indeed, for GRUNERT *et al.* (2004) brand if combined with quality and reliability built over time, can be considered the most important extrinsic quality cue when purchasing beef for consumers not so aware of beef features and therefore struggling to formulate their expectations about beef quality cues. In this same vein BREDAHL (2003) and BANOVIĆ *et al.* (2010; 2012) demonstrated that consumers focus on brand when they are not so familiar with beef products, which leads to hesitation at the moment of purchase. Besides brand, price is also used by hesitant consumers as predictive of beef quality (BELLO ACEBRÓN and CALVO DOPICO, 2000; TOLOSANA *et al.*, 2005; MERLINO *et al.* 2018). Cluster 4 consumers are also ready to pay more than the

average beef market price (maximum +5%) to rely on a better quality system as already stated by BELLO ACEBRÓN and CALVO DOPICO (2000) and GRUNERT *et al.* (2004). On the contrary BREDAHL (2003), carrying out a study on the Danish beef market, found that price is not considered such an important extrinsic quality cue for Danish consumers. Our insights about Cluster 4 are in line with past studies concerning consumer behavior, stating that older women pay more attention seeking information about product safety and quality. (e.g. RICHARDSON *et al.*, 1996; ROSZKOWSKA-HOŁYSZ, 2013). From our study, media information seems decisive in determining older women's purchasing choices. In this domain, KUO *et al.* (2011) found that in general all women adopt a more "protective behavior"(p. 5) than men, in that they are more aware of food risks and the importance of safety issues. Finally, results are in line with the study conducted by BANTERLE and STRANIERI (2008), which showed that, among European consumers, Italians are more sensitive to the issue of safety and food certification. The research shows that Italians make extensive use of information reported on labels, such as information on certification and meat origins.

Intrinsic quality cues and part of the expected quality attributes, apart from safety, are of paramount importance when the consumer is aware of the product and its special quality features. In this respect BREDHAL *et al.* (1998), for example, pointed out that making the relationship clear between expected and organoleptic characteristics - e.g. intrinsic quality cues – is important to understand how consumers shape their expectations about beef. This study confirms that these characteristics are important at least for Cluster 2, which represents 12.98% of the entire sample. Cluster 2 is made up of young men who are mostly unaware of traceability labels and don't read them. They are willing to pay over 10% of the current beef market price to have better quality beef and their beef consumption is on average once a week.

These consumers seem to pay great attention to intrinsic quality cues and results are in line with several studies conducted in the literature. *In primis*, the male gender, whose result is discriminating for Cluster (2) and Cluster (1), confirms the study of several authors like e.g. SOBAL (2005), CAVAZZA *et al.* (2015), BASFIRINCI and CILINGIR UK (2017), according to whom the consumption of red meat is an expression of virility and strength and is more associated with the male identity. Indeed, the female is associated with sweet foods (LUPTON, 1996), fruit (O'DOHERTY AND HOLM, 1999) and dietetic products (MOONEY AND LORENZ, 1997; BASFIRINCI AND CILINGIR UK, 2017). Finally, LENNERNÄS *et al.* (1997), BILOUKHA and UTERMOHLEN (2001) and Piggford *et al.* (2008) showed that "sensory appeal" (PIGGFORD *et al.*, 2008, p.19) (including smell, appearance, palatability and pleasure), represent the factors that influence the male purchases. According to PENG *et al.* (2005), in fact, male consumers pay more attention to product quality and the purchasing environment, than do female consumers.

Cluster 1, representing 12.08% of the sample is made up of young men, mostly students, employees and laborers. They frequently consume beef, but seem not to be affected by any quality cue and/or attribute at the moment of purchase. These results are not surprising in that, in general, men have less shopping experience and pay less attention to information about safety and quality than women (e.g. TZIMITRA-KALOGIANNI *et al.*, 2003; KUO *et al.*, 2011).

Cluster 3 individuals (23.71% of sample) give a component as the visual aspect of the meat (cut) an attribute (succulence) that can be evaluated through taste and two other attributes (nutritional values and wholesomeness) that cannot be measured because they are part of

the beliefs, which can be found in the purchase psychological factors (FONT-I-FURNOLS AND GUERRERO, 2014). The cut is linked to these attributes, because the amount of fat in the meat varies according to the cut and, as stated by SHAN *et al.* (2016), consumers are very attentive to these aspects. In particular, young Italians, who among various purchasing factors also consider livestock feeding, since there is a relationship between this and nutritional value and healthiness (BANTERLE AND STRANIERI, 2008). Moreover, while several studies claimed that women are more attentive to factors such as nutritional value and healthiness (for both health and body care reasons) compared to men (DREWNOWSKI AND HANN, 1999; HOLM, 2003; SHAN *et al.*, 2016), this distinction does not emerge from the results of the present study. Cluster 3 is composed of both men and women. The results show that even men are becoming more sensitive to these issues nowadays.
Traceability and safety issues emerged to a certain extent in the previous discussion when we analyzed the identified Cluster characteristics, but our study also focuses specifically on this issue with the second research question.

- *How traceability and safety issues affect consumer preferences and choices?*

Traceability labels were found important for Cluster 4. In particular, consumers in this cluster are aware of traceability labels and read them. Also, it can be observed that Cluster 4 consumers are also ready to pay a higher price than the actual average beef price for a better quality system. To understand why, we considered the traditional food issueand found that consumers falling in this cluster ready to pay a higher price to have a better quality system are 205 out of 229 representing 89.52% of Cluster 4 and are mostly resident in Tuscany (43.24%) – where beef is a traditional food. The importance of safety issues as a whole has already been highlighted in literature, above all after the emergence of BSE (e.g. BRUNSØ *ET AL.* 2005; GRUNERT, 2005), but the results of this study seem to suggest that consumers today are more aware of beef quality related issues for health in general and especially when this food is known and frequently purchased, these features become of paramount importance.
The third research question introduced the traditional food issue, not yet considered in literature, which seems to play a role in beef purchase choice.

- *Do consumers in regions where beef is a traditional food, consider the impact of traceability and safety issues differently at the moment of purchase?*

Cluster 1, 2 and 3 consumers are mostly resident in Latium (45%, 58.61% and 42.46% of the sample) where beef is not a traditional food and they seem not to be affected by traceability and safety issues at the moment of purchase. On the contrary, consumers in Cluster 4 are aware of traceability and safety issues and are mostly resident in Tuscany (43.24% of the sample) where beef is a traditional food (MIELE AND MURDOCH, 2002). In this sense, it seems that residence – e.g. traditional food - could be considered a discriminating factor affecting evaluation linked to traceability and safety issues before beef purchase.

4. CONCLUSION

This paper adds some insights into beef meat consumer preferences before purchase: (a) quality cues and/or attributes diversely affect consumers with various socio-demographic characteristics; (b) being a traditional food can affect consumer choices; (c) traceability and

safety have become crucial in shaping before purchase consumer preferences, especially after the emergence of BSE some years ago. This is also because national and international bodies have focused their attention on these issues, obtaining feedback in terms of the importance of these issues recognized by some consumers.
The paper also has some limitations, which could be of help to identify future avenues of research. Principally: (a) the number of questionnaires and the limited places in which they were collected; future studies should consider other Italian regions but also other Countries, verifying the role of the traditional food issue in a more focused way; (b) the study just considers quality cues and attributes before purchasing and does not compare them with the after purchase experience; this could be another future avenue of research.
Among theoretical implications, the most important refers to the attempt to widen the perspective used to study beef quality and its cues and attributes to better understand consumer preferences and purchasing choices. Even if familiarity with beef products has been studied (BANOVIĆ *et al.*, 2010; 2012), other contextual factors could play a role and they should be understood better to paint the "full picture" in this domain.
Adopting the managerial perspective, it becomes clear that it is crucial to firms operating in this industry to know which quality cues and attributes are important in shaping different consumer cluster expectations and preferences. In particular, new value offerings could be shaped *ad hoc* for different and above all emerging clusters considering, besides beef quality cues and attributes, socio-demographic characteristics and also contextual factors like food culture and the traditional food issue. This factor, together with other contextual factors for further research, could play an important role in creating new product offerings and/or modify the present ones in the light of further enhancing consumer knowledge about beef quality and could therefore lead to somewhat modifying the "expectation side" of satisfaction, the after purchase phase of the consumer experience not investigated in this paper.

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