

Socioeconomic factors associated with the perception and attitude of consumers toward traced meat in Contagem, Minas Gerais, Brazil

Peter Bitencourt Faria, Marcos Aurelio Lopes¹, Fabio Raphael Pascoti Bruhn, Fernando Moreira de Carvalho Melado, Agnelo Franco Neto, Christiane Maria Barcellos Magalhaes Rocha, Lucio Violin Junqueira e Renato Lopes Previdelli

Universidade Federal de Lavras, MG, Brasil
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Abstract. The aim of this study was to analyze knowledge related to bovine traceability and to profile the perception and attitude of consumers toward traced beef in Contagem, Minas Gerais, Brazil; in addition to verifying which socioeconomic factors are related to purchasing decisions regarding traced meat. The variables were described and a multiple model Generalized Estimating Equations (GEE) logistic regression was elaborated to identify possible associations between the socio-economic characteristics of consumers and the key attributes of meat that influence their decision to purchase it. Data were accumulated through interviews of 400 consumers in April 2012. The presence of the stamp of the Brazilian Federal Inspection Service (SIF) on the product was the attribute that most influenced the consumers' purchasing decisions. The majority of the interviewed people had never heard about beef traceability. Among those who had heard about it, most were willing to pay more for traced meat. However, there are disadvantages associated with traceability, mainly in relation to increased meat price. Consumers with higher levels of education and income had a better understanding about this type of certification; moreover, higher monthly incomes were associated with greater consumer willingness to pay more for traced meat.

Key words: Bovine traceability, Consumers profile, Food safety.

Fatores socio-econômicos associados à percepção e atitude de consumidores de carne bovina com certificação de origem em Contagem, Minas Gerais, Brasil

Resumo. O objetivo deste estudo foi levantar o perfil de percepção e atitude dos consumidores de carne bovina em Contagem/MG e verificar fatores sócio-econômicos estão relacionados à decisão de compra de carne com certificação de origem. Foi realizada a descrição das variáveis e elaboradum modelo múltiplo *Generalized Estimating Equations* (GEE) de regressão logística visando identificar possíveis associações entre as características sócio-econômicos e principais atributos da carne que influenciam a decisão para sua compra, sendo estas informações obtidas por meio de entrevistas à 400 consumidores no mês de abril de 2012. A presença do carimbo do Serviço de Inspeção Federal (SIF) foi o atributo que mais influenciou a decisão de compra dos consumidores e a maioria dos entrevistados nunca ouviu falar sobre rastreabilidade bovina. Dentre os que já ouviram falar em rastreabilidade bovina, a maior parte está disposta a pagar mais pela carne com certificação de origem, apesar de considerar que há desvantagens associadas à rastreabilidade, principalmente em relação ao aumento no preço da carne. Consumidores com maior grau de escolaridade e renda apresentaram uma melhor percepção sobre este tipo de certificação e uma maior aceitabilidade em pagar mais caro pela carne rastreada.

¹Autor para la correspondencia, e-mail: malopes@dmv.ufla.br

Palavras-chave: Perfil dos consumidores, Rastreabilidade bovina, Segurança alimentar.

Introduction

Food safety plays a strategic role in world trade, and is a global concern (Nesbaken, 2009). According to Sofos (2008), the challenges related to the safety of animal products and the difficulties in controlling efficient processing generate the need for mechanisms capable of reducing the potential risk of food borne diseases.

Furthermore, traceability offers a way to integrate the entire supply chain in a system of monitoring and certification, thus improving the perception of safety for consumers due to the generation of information related to meat (Prache *et al.*, 2005; Verbeke *et al.*, 2010). Brazil is one of the largest suppliers of beef to the European Union, and one of the requirements to continue this exportation was the implementation of a traceability program. Traceability can be defined as the mechanism to identify the origin of the product from the farm to the final consumer, which may or may not undergo one or more transformations, as in the case of minimally processed foods; thus it is a set of measures that allow to systematically control and monitor all inputs and outputs in units of the final product

(Cócaro and Jesus, 2007). According to Ubilava and Foster (2009), quality certification is a market segmentation that leads to opportunities for food processors and retailers, as they form part of the management functions and are involved in control of the production system.

Traceability aims to improve security in the process of obtaining meat and its derived products. However, these benefits are not as clear to consumers as they are to researchers and the industry (Wezemael *et al.*, 2011). It is important, therefore, to assess whether consumers know the concept of traceability and if the traced meat, which is currently sold in supermarkets, is included in their desired purchases, and if they are willing to pay more for this meat.

Thus, the purpose of the present research was to analyze consumer knowledge related to bovine traceability and willingness to pay more for traced meat, and to profile the perception and attitude of consumers toward traced beef in Contagem, Minas Gerais. Also of interest was to determine the association between socioeconomic aspects and the consumers' decision to purchase.

Material and Methods

An observational study was conducted in supermarkets in the city of Contagem, Minas Gerais State, in April 2012, to evaluate the association between the perception and attitude of consumers toward traced beef and some sociodemographic characteristics. Minas Gerais is the second largest Brazilian state regarding beef cattle population, with approximately 24 million head in 2012 (IBGE, 2012), and ranks fifth in number of slaughtered cattle, with about 770,000 in the last quarter of 2013 (IBGE, 2013). The state presented a per capita consumption of beef in 2009 of approximately 21 kg, a value close to the average in the rest of the states of southeastern Brazil, (23 kg) and in all of Brazil, (24.6 kg; IBGE, 2009). Contagem is the second most populous city of the state. It is located in the mid metropolitan region of Belo Horizonte, the third largest urban conglomerate in Brazil, behind only São Paulo and Rio de Janeiro. This fact indicates the relevance of the study region to the internal market for beef produced in the state.

The definition of the number of respondents ($n = 400$) was based on the study of Barbetta (2007), considering a maximum sample error of 5% and the

population of 603,442 inhabitants of Contagem (IBGE, 2010).

Interviews to investigate the perception and attitude of beef consumers, were conducted by a single researcher based on a structured form (36 multiple-choice questions) (Table 1), adapted from Velho *et al.* (2009) and applied by Lopes *et al.* (2014). The information obtained from all the interviewed people was related to socio-demographic characteristics, such as: gender, age (up to 40 years, more than 40 years), education (up to high school graduate, more than high school) and income (up to six times the minimum wage; more than six times the minimum wage). These were used as independent variables in the study. During the period of data collection, one Brazilian monthly minimum wage corresponded to US\$273.04.

The respondents were randomly selected and invited for the interview while they were in front of the meat showcase at the supermarket. For consumers who had never heard about traced beef, the interview was restricted to issues concerning the sociodemographic characteristics. The present study

Table 1. Summary of the questions included in the interview applied to beef consumers in Contagem, Minas Gerais, 2012

Item	Dichotomous Variables (Answer: yes/no)
Attitude	Consumption of certified animal products <ol style="list-style-type: none"> a. Willingness to pay more for a certified animal product b. Willingness to pay more for traced meat: 1. <5%, 2. 5%, 3. 10%, 4. 15%, 5. 20%, 6. more than 20%.
Perception	If he/she had ever heard about traceability, traced meat or meat with origin warranty. <ol style="list-style-type: none"> a. Most important attribute affecting the meat purchase: 1. presence of the quality seal, 2. stamp of the Brazilian Federal Inspection Service (SIF), 3. price, 4. high, or, 5. low fat, 6. easy/fast preparation, 7. raising or fattening, 8. place of slaughter, 9. purchase, 10. breeding, 11. animal sex, 12. softness/texture, 13. odor, 14. color b. Concept of traced meat: 1. meat that has the nutritional information on the package; 2. meat product that has no contaminants or chemical residues; 3. meat that includes information related to the system of production and origin of the animal, and 4. beef inspected by the federal system or state service c. Benefits of traced meat over meat without traceability: 1. greater competitiveness in overseas markets; 2. better quality, more nutritious and tasty; 3. greater security and less risk to public health; 4. access to information about age, sex, breed or other; and 5. none d. Disadvantages that traced meat could involve: 1. higher price, 2. lower supply, 3. valorization of all meat, and 4. none

is in compliance with requirements regarding research with human subjects, as stated in the Resolution number 196/1996 of the Brazilian National Health Council.

To identify the sociodemographic characteristics associated with the perception and attitude of socioeconomic factors associated with the perception and attitude of consumers towards traced meat, a univariate analysis was performed by chi-square (χ^2) or Fisher Exact. The Fisher Exact was used when there were less than five observations in each quadrant present in the contingency table of the test. The variables associated with $P \leq 0.2$ by χ^2 test or Fisher Exact, were selected for multiple model construction (Bruhn *et al.*, 2013).

The association between factors was verified using the multiple model Generalized Estimating Equations (GEE) logistic regression, which is more appropriate when observing associated data in different dimensions (Hanley *et al.*, 2003), as in this study, which involved the responses of consumers present in different supermarkets (considered subjects of the model). The GEE analysis allows for evaluation of the association of multiple interviewed individuals considering the supermarket in the model, assuming that the cases are dependent within each subject and independent between subjects. For all variables in the final model ($P < 0.05$), the risk was calculated by Odds Ratio (OR) and with an adjusted confidence interval of 95% (Bruhn *et al.*, 2013).

Results

In this study a slight majority of the respondents (51.0%) were male, most respondents were 40 years of age or older (56.5%), had a middle or high school

level of education (65.7%) and an income not exceeding six times minimum wages (77.8%) (Table 2). A minority of the respondents (31.5%) reported

having heard about traced meat, while 50.8% reported consumption of animal products with certification.

Among consumers who had heard of traced meat, the main criteria considered in their decision upon purchasing beef were: the presence of the SIF or state stamp (28.6%), presence of quality seal (27.0%), amount of fat present in the product (11.9%), rural property in which the animal was raised (11.1%), meat odor (4.8%), slaughterhouse where sacrificed (4.0%), local purchase (3.2%), price (3.2%), tenderness (2.4%) and ease of preparation (2.4%). Furthermore, 37.3% cited the correct concept of meat traced as: a product that includes information about source, as opposed to other incorrect definitions, such as meat with surveillance by SIF (Stamp) or state service (28.6%), meat product that has no contaminants or chemical residues (20.6%) and meat that includes nutritional information on the packaging (13.5%).

Only 3 (2.4%) of the people interviewed felt that there is no benefit of traced beef over non-traced, and the most common benefit mentioned was the greater food safety and less risk to public health (64.3%). Most respondents (65.9%) believe that there are disadvantages of traced meat in relation to non-traced, especially regarding increased price of the product (35.7%). Nevertheless, the majority reported that they would accept to pay more for traced meat (69.0%), but only an increase of up to 5% in price (60.9%).

In this study education level was the main socio-economic characteristic positively associated with improved perception and attitude of the respondents in relation to consumption of traced beef (Table 3).

Regarding perception, people with a higher educational level were more likely to understand how traced meat increases food safety through reducing the risk of foodborne disease transmission. Also, this specific group more frequently appreciated the benefit of absence of contaminants or chemical residues in these meat products. Regarding the consumer's attitude, those of the higher educational level tended to think more about the place (farm) where the animal was raised and less about the amount of fat present in the meat.

The monthly income of respondents was also associated with the perception and attitude towards buying traced beef (Table 4). Individuals with incomes higher than six times the minimum wage had a greater tendency to have heard about traced meat, and were more likely to agree to pay more for the product.

The consumer's attitudes were also influenced by gender (Table 5). Female consumers were less likely to purchase traced meat, and more likely to consider the place of origin of the cattle as the most important factor in the beef purchasing decision.

Age constitutes another influential factor on consumer perceptions towards beef (Table 6). Individuals over 40 years old more frequently believed that traced meat carries nutritional information on the package, and were less likely to consider traced meat as inspected meat (SIF stamp or that of any other state service). In addition, older individuals had a lower tendency to consider the value of all meats, with traced beef having a disadvantage when compared to non-traced beef.

Table 2. Sociodemographic characteristics of beef consumers (n = 400) in Contagem, Minas Gerais, 2012

Variables	Category	%
Gender	Male	51,0
	Female	49,0
Age	30-40 years old	43,5
	Over 40 years old	56,5
Education	Middle and High School	65,7
	Over High School	34,3
Income	1-6 times minimum wages	77,8
	Over 6 times minimum wages	22,2

Note: Brazilian minimum wage = US\$273.04

Table 3. Factors associated with education among beef consumers who had knowledge of the term «traced meat» in Contagem, Minas Gerais, 2012.

Question raised	Education	Answers		Total(%)	P Value	Odds Ratio	IC(95%)
		No	Yes				
Most important attribute for the purchase of meat: low fat content	Middle and High School	49	11	60 (18,3)	0,000	1	0,204-0,405
	Over High School	62	4	66 (6,1)			
Most important attribute for the purchase of beef: local farm where the animal was born and raised	Middle and High School	57	3	60 (5)	0,000	1	3,742-5,336
	Over High School	55	11	66 (16,6)			
Concept of traced meat described as a product that has no chemical residues or contaminants	Middle and High School	43	17	60 (28,3)	0,010	1	0,228-0,818
	Over High School	57	9	66 (13,6)			
Benefits that traced meat could provide over meat without traceability: better quality, tastier, and more nutritious	Middle and High School	49	14	63 (22,2)	0,000	1	0,307-0,669
	Over High School	58	8	66 (12,1)			
Benefits that traced meat could provide over meat without traceability: enhance security and prevent increase of risk of food-borne disease outbreaks	Middle and High School	27	33	60 (55)	0,000	1	1,412-3,372
	Over High School	18	48	66 (72,7)			

^aMultiple logistic regression estimated by Generalized Estimation Equations (GEE); contains only the factors that remained with the statistically significant association in the final model (P<0,05)
n= 126 - only the interviewed people who answered that have already heard about traced meat were considered in the model

Table 4. Factors associated with income among beef consumers who had knowledge of the term «traced meat» in Contagem, Minas Gerais, 2012.

Question raised	Income (Times Brazilian minimal wage)	Associated variables ^a				P Value	Odds Ratio	IC (95%)
		Answers		Total (%)	Yes			
		No	Yes					
Have you ever heard about traceability, traced meat, or meat with certificate of origin?	1-6 Over 6	193 30	63 43	256 (24,6) 73 (58,9)	0,001	1 2,875	1,508-5,482	
Concept of traced meat can be described as: meat that includes the nutritional information on the package	1-6 Over 6	51 42	12 1	63 (19,0) 43 (2,32)	0,000	1 0,059	0,013-0,262	
Would be willing to pay more for origin certified animal products?	1-6 Over 6	26 5	37 38	63 (58,7) 43 (88,3)	0,018	1 4,783	1,305-17,531	

Note: Brazilian minimum wage= \$273.04 per month.

^aMultiple logistic regression estimated by Generalized Estimation Equations (GEE); contains only the factors that remained with the statistically significant association in the final model ($P < 0,05$)

^bn=400

n = 126 - only the interviewed people who answered that have already heard about traced meat were considered in the model

Table 5. Factors associated with gender among beef consumers who had knowledge of the term «traced meat» in Contagem, Minas Gerais, 2012

Question raised	Gender	Answers		Total (%)	P Value	Odds Ratio	IC (95%)
		No	Yes				
		Associated variables ^a					
Have you ever heard about traceability, traced meat, or meat with certificate of origin? ^b	Male	119	85	204 (41,6)	0,003	1	0,412-0,508
	Female	155	41	196 (20,9)		0,458	
Do you consume origin certified animal products?	Male	36	49	85 (57,6)	0,000	1	0,213-0,586
	Female	26	15	41 (36,5)		0,354	
Most important attribute for the purchase of beef: local farm where the animal was born and raised	Male	78	7	85 (8,2)	0,009	1	1,297-6,256
	Female	43	7	50 (14)		2,848	

^aMultiple logistic regression estimated by Generalized Estimation Equations (GEE); contains only the factors that remained with the statistically significant association in the final model ($P < 0,05$)

^bn=400

n= 126 - only the interviewed people who answered that have already heard about traced meat were considered in the model

Table 6. Factors associated with age among beef consumers who had knowledge of the term traced meat in Contagem, Minas Gerais, 2012.

Question raised	Age (Years)	Answers		Total (%)	P Value	Odds Ratio	IC (95%)
		No	Yes				
		Associated variables ^a					
Concept of traced meat can be described as: meat with nutritional information on the package	30-40	41	3	44 (6,8)	0,003	1	2,075-38,759
	Over 40	68	14	82 (17,0)		8,967	
Concept of traced meat can be described as: meat inspected by the Federal Inspection System (SIF) or state service	30-40	28	16	44 (36,3)	0,000	1	0,542-0,656
	Over 40	29	15	44 (34,0)	0,000	1	0,370-0,643
Disadvantages of traced meat could bring: valorization of all meats	30-40	29	15	44 (34,0)	0,000	1	0,370-0,643
	Over 40	66	16	82 (19,5)		0,487	

^aMultiple logistic regression estimated by Generalized Estimation Equations (GEE); contains only the factors that remained with the statistically significant association in the final model (P<0,05)

^bn=400

n= 126 - only the interviewed people who answered that have already heard about traced meat were considered in the model

Discussion

Price is often a decisive factor in meat purchasing decisions by consumers (Verbeke and Vackier, 2004; Hocquette *et al.*, 2012). Angulo and Gil (2007), found that in Spain price is one of the most important factors establishing risk perception of food safety, consumers believing that more expensive products have some kind of advantage. However, similar to the present results, other reports indicate that most people consider factors other than the product price, as more important. Tonsor and Marsh (2007), in the United States, found that about 75% of the variability in demand or consumption is related to factors beyond the price of meat and consumer income.

According to Unnevehr *et al.* (2010), ethical and social issues are the variables that have the greatest influence on food choices, especially in developed countries. In a survey of beef consumers in five European countries (France, Germany, Poland, Spain and the UK), Wezemael *et al.* (2011) found better consumer acceptance for the use of techniques that improve their safety. This is especially true in relation to the application process, as in adoption of traceability in the production system. This aspect was also observed in the present study, since most of the respondents (55.6%) mentioned that the most important factors in their beef buying decisions were presence of the SIF stamp and of quality labels. Consumers of the area surveyed considered indicators of quality and traceability as important in the decision to purchase beef.

De Zen and Brandão (1998) in a study in São Paulo found that beef consumers, in general, valorize the quality of a product by its external characteristics, such as color and texture. However, for low income consumers this appreciation loses its high importance to the product price. The appearance (color/texture) and odor were mentioned by only the minority of respondents in the present study as observed characteristics when buying beef in a supermarket. Resurreccion (2003) stated that the sensorial factors that influence changes in consumer demand for meat are: appearance, softness, taste and succulence. Velho *et al.* (2009) in Rio Grande do Sul, Brazil, found that the appearance, mainly related to the color of the flesh, was cited as the most important aspect in the purchase decision. Several authors have reported this behavior, since the color as observed by the consumer is an obvious index of freshness and quality (Sarantopoulos and Pizzinato, 1991; Olivo *et al.*, 2001; Krystallis *et al.*, 2007).

Brumm and Terra (1988) pointed out that dark or greenish colored meat and its moist surface may suggest a state of decomposition and the development of bacteria that increase the risk of foodborne diseases. In the Republic of Georgia, Ubilava and Foster (2009) suggested using a logistic regression model and pointed out that both consumers and members of the meat production chain ought to be concerned primarily with the visual appearance of the meat, in order to avoid buying spoiled products.

Krystallis *et al.* (2007) found that Greek consumers prefer to buy meat directly from butchers, where they believe they can be sure of its origin, instead of consulting the information available on the labels of products found in supermarkets. Thus, they prefer to rely on visual quality rather than brands and quality certifications.

On the other hand, some authors claim that the consumer makes the decision to buy meat based on a large number of variables (price, label, brand, appearance and type of cut), which, eventually, would be related to quality attributes in terms of: tenderness, flavor, freshness and nutrition (Krystallis *et al.*, 2007; Verbeke *et al.*, 2010; Troy and Kerry, 2010). However, this behavior is changing and consumers are focusing greater attention and concern on extrinsic characteristics of the product, for example: factors related to animal production system and the use of other technologies (irradiation of food, organic farming, biotechnology, antibiotics, pesticides and growth hormones) (Unnevehr *et al.*, 2010). According to Sato and Silva (2008), the consumer profile is also changing. Due to increased access to information, consumers are increasingly demanding quality attributes in relation to the meat they purchase.

The present results showed greater knowledge about traceability than those reported by Zhao *et al.* (2010), in which only 3% of the 588 respondents from Beijing and Xianyang, China, were familiar with the concept of real traced meat. One of the in the Republic of Georgia, factors that contributed to the low level of familiarity in China was the fact that traceability is new in that country, the first imports occurring in 2009.

A minority of the present respondents considered that there is no benefit in traced beef over non-traced. Mørkbak *et al.* (2008) pointed out that consumers have a positive disposition to buy the product when, among other attributes, there is a guarantee that it is safe. According to Grunert *et al.* (2004) it is necessary to ensure a guarantee of origin for the product, showing that it was produced under

good manufacturing practices and thus qualifies for the certificate of origin. This is analogous to the guarantee certificate of any other product, building trust in its purchase. Angulo and Gil (2007) pointed out that to enhance the perception of food safety, the quality control systems should be strengthened and the information disseminated to the population.

Most of the present respondents considered that there are disadvantages of traced meat when compared to non-traced, the main reason being increased price. Even so, most people reported willingness to pay more for traced meat, but only a price increase of up to 5%, which can be considered a low margin. According to Lazzarotto (2011) in Brazil, certified meat can have price margins up to 30% higher than the product without certification of origin. Zhao *et al.* (2010), found higher percentage margins than those of the present study, reporting that the majority of respondents in China would pay 9-12% more for traced products.

In Korea, where most of the meat consumed is imported, Lee *et al.* (2011) observed a willingness of consumers to pay up to 39% more for traced beef over non-traced. This result reflects consumers' concerns about food safety in relation to meat imported from the United States, due to the occurrence of Bovine Spongiform Encephalopathy (BSE) in previous years.

The present results reveal a lower sensitivity and perception of Brazilian consumers regarding the actual benefits of the system, as indicated by the small price increase that they are willing to pay for the traced products. This behavior may be due in part to the non-occurrence of BSE and the position of Brazil as a major meat exporter.

According to some authors, the traceability costs are likely to be absorbed by the beef industry, due to increased product demand and consumer trust (Resende Filho, 2008; Pendell *et al.* 2010).

Resende Filho (2008) evaluated the potential benefits of animal traceability for the meat sector of the USA and estimated that the implementation cost of the system would be paid for by the gain in revenue, with an estimate of increased cost and revenue of around 30%. Also in the USA, Pendell *et al.* (2010) conducted an assessment of the impact on the production cost for the use of identification and traceability, and arrived at the following percentage increases: 0.007% in the wholesale price of meat, 0.12% in the price of slaughter cattle and 0.43% in on farm production costs.

The present study characterized the socio-economic profile associated with the perception and attitude of domestic consumers of Brazilian beef in

relation to traceability ($P < 0.05$). In other countries, different profile of consumers based on age have been verified. In Greece for example, respondents over 60 years old, consider the visual quality of the product as the most important attribute, while the middle-aged (between 40 and 60 years) take into account many of the sensory aspects of food safety. However, in both Greece and Belgium young people (under 40 and 25 years, respectively), are more indifferent to the sensory aspects of meat, showing a lower perception of the attributes related to quality and safety, which was ascribed to their lesser involvement in beef purchasing and consumption (Krystallis *et al.*, 2007; Verbeke and Vackier, 2004).

In the present case, interviewees with higher levels of education were more likely to consider as benefits of traced meat, greater food safety due to reduced risk of diseases transmission. Also, the people were less likely to accept the incorrect concept that traced meat has no contaminants or chemical residues. These results indicate that education improves people's awareness about the importance of traced beef, due to increased access to information, providing greater transparency and understanding of the steps involved in the production process. This entails a higher level of assurance and safety in the final product.

Another aspect that reflects positively on increased knowledge of traceability is meat consumers who have children. According to Verbeke and Vackier (2004), this public sector shows greater caution related to buying meat, seeking out extra information about the origin and characteristics of products, due to a greater concern about food safety and a healthy diet.

In the present study it was also found that individuals with higher monthly income were more likely to accept paying a price for traced meat. This result is probably related to a better understanding of this type of product, since individuals with higher income also presented a higher frequency of having heard about the traced meat. Knowledge about traced meat is related to a favorable attitude toward consumption of this product. As expected, consumer income was shown to be a factor of great influence on the willingness to pay more for traced beef. Similar behavior has been observed in other countries. This type of consumer represents two-thirds of the market and corresponds to the portion of people in which marketing and dissemination of information on traceability would promote better outcomes (Verbeke and Vackier, 2004; Krystallis *et al.*, 2007).

Regarding interviewee age and the variables of perception, it was found that older individuals were more likely to conceptualize traced meat as one with a SIF stamp on it. Veterinarians in the service of the Brazilian government perform the SIF inspection, aiming to provide greater food security, and reflect a positive image to consumers.

No association was found in the present data between the variables of attitude and age of consumers. However, it is notable that women tend to

consume less traced meat than men. These results disagree with those of Solomon *et al.* (2010), who found that the demand for traced food products is a trend among young women.

Considering the beef consumers' profile in its different aspects, to provide greater diffusion and demand for traced products, it will be necessary to adopt strategies for serving information more directly, especially in places where beef is sold, such as supermarkets and specialty butchers.

Conclusion

The majority of the respondents to the survey had never heard about beef traceability. This low level of knowledge about what the system entails reflects little consciousness of many consumers about meat processing and the factors that may interfere with its quality and safety. However, the healthfulness of the products is still a major concern for consumers, while other intrinsic and extrinsic characteristics are decreasing in influence over

purchase decisions. Consumers with higher income and level of education have a better perception of the quality aspects of meat and seek further information about the products they are buying. Furthermore, those with higher income showed an increased willingness to pay more for traced meat. Nevertheless, they consider that there are also disadvantages associated with traceability, especially in relation to increased meat price.

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