Attitudes and the Influence of Environmental Attributes on the Intention of Buying Beef

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Resumo

This study aims to contribute to literature, proposing a complementary model focused on the reality of an emerging country. This work evaluates the influence of environmental aspects on the attitudes towards, intention to buy, willingness to pay, involvement, concern over the productive process and brand equity of beef. Interviews with experts and two focus groups were used to validate the aspects found in the literature which were then grouped in a proposed conceptual model. Then an online survey was carried out with 725 surveyed and the proposed structural model was tested using the SmartPLS-3.0 software. Eight hypotheses were proposed. The model suggests that product involvement and concerns over the production process are related to attitudes towards and intentions of buying sustainable meat. However, brand equity (including food safety) is only correlated with attitudes towards sustainable consumption and is not related to the actual intention of buying sustainable meat. These factors can help the industry and the retail sector when formulating communication strategies and with the positioning of products/brands that possess socio-environmental attributes in the market as part of the benefits offered to the consumer.

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Abstract
This study aims to contribute to literature, proposing a complementary model focused on the reality of an emerging country. This work evaluates the influence of environmental aspects on the attitudes towards, intention to buy, willingness to pay, involvement, concern over the productive process and brand equity of beef. Interviews with experts and two focus groups were used to validate the aspects found in the literature which were then grouped in a proposed conceptual model. Then an online survey was carried out with 725 surveyed and the proposed structural model was tested using the SmartPLS-3.0 software. Eight hypotheses were proposed. The model suggests that product involvement and concerns over the production process are related to attitudes towards and intentions of buying sustainable meat. However, brand equity (including food safety) is only correlated with attitudes towards sustainable consumption and is not related to the actual intention of buying sustainable meat. These factors can help the industry and the retail sector when formulating communication strategies and with the positioning of products/brands that possess socio-environmental attributes in the market as part of the benefits offered to the consumer.
Key-Words: Marketing; Sustainability; Beef; Production Process; Intention of Buy.

1 Introduction

Retail networks have shown interest in marketing products with socio-environmental attributes, however they emphasise the lack of awareness of the final consumer on these attributes, which makes it difficult to exercise a premium pricing policy for "Green" products. In 2015, the three largest retail chains in Brazil (Carrefour, Wal-Mart and Grupo Pão de Açúcar) began to develop sustainable livestock platforms, demonstrating a strong commitment to monitoring the origin of meat sold in their stores. (Greenpeace, 2015). The origin of the meat refers to the compliance with environmental partnership practices of the farms that breed the animals to be slaughtered and put up for sale in the national retail market. However, consumers do not seem to recognize the effort made by the networks, especially in regard to the resulting price practices. A survey conducted by Carrefour (2016) demonstrates that there is a great challenge being faced by retailers regarding consumer awareness of the origin of their products in order for them to appreciate the value of a sustainable product.

Products with organic, natural, ecological and fair-trade labels no longer only appear as a niche in the food market in some developed countries. Market research carried out by the Boston Consulting Group on the US market shows that these "green" products are entering large retail chains and have become a significant market with a broad consumer base, purchasing so-called "responsible consumption" (RC) products. In this study, the results show that the sales of RC products have increased 70% in the last three years and represent 15% of the total sales of the American networks (Smits, Wald, Vismans, & Huet, 2014)

An innovative aspect of this research is the approach to the socio-environmental theme in the purchasing intention of the consumer. Several studies (Brunsø, Fjord & Grunert, 2004; Gao & Schroeder, 2009) discuss the intrinsic characteristics of meat, in this case there are only a few studies that analyse the influence of environmental attributes and food safety in the choice of meat by the Brazilian consumer. Additionally, the study on the influence of brands on purchasing decisions ‘can be considered an innovative theme as brand appreciation appears to be recent movement within the beef sector in Brazil. The recent focus on brand creation as opposed to the concept of commodity in the Brazilian beef sector is something for consideration in this study, which intends to discuss intangible attributes of brands in relation to safety in beef consumption.

Here, conscientious consumption brings about reflection on both habits and choices, analysing the impact they can have on the ecosystem. Issues such as avoiding waste and reusing and recycling packaging are featured in promotional material (e.g., leaflets) from retailers. Grupo Pão de Açucar - GPA gives information on the control policy of its beef supply chain throughout the country. In this printed material, the GPA emphasises that, through documents, suppliers pledge to provide an electronic system with details on the course and origin of the meat in order to "combat the impacts of livestock production on the Amazon biome, so as to avoid deforestation and other possible societal impacts." (Pão de Açucar, 2017). The term 'sustainability' within the beef sector is directly related to various socio-environmental factors. Cattle breeding is considered to be one of the sectors that most contributes to deforestation in Brazil. The conversion of forests into pastures is the best known, well documented environmental impact of the beef supply chain, with livestock farming accounting for 18% of greenhouse gas emissions (Drigo, 2013). In addition, issues related to animal welfare, slave labour, and gas emissions (CO2 and methane), appear to be directly linked to the term "sustainable meat". In practice, the industry (meatpacking) and retail also consider these themes as the basis for defining their sustainable livestock platforms. Ergo, when considering the term "sustainable meat" this study refers to the main socio-environmental issues mentioned above.
One of the disparities we encountered was that a large number of studies on the subject of sustainability in food can be found abroad, especially meat, while few are found in Brazil. The relevance of this research lies in linking constructs that deal with product involvement, concerns regarding the productive process and the attitude of the consumer towards sustainability in the Brazilian beef sector. It is noted that previous studies have addressed environmental awareness and the attitude of the consumer; product involvement and behavioural attitudes and intentions, or even the relation between attitude and intention to buy, in separate models. In this study, these variables will be part of a single structural analysis model.
In the absence of a specific scale to measure factors related to the production process, this study proposes a construct based on a qualitative study as well as a literature review on the sustainability actions actually developed by the sector.
In order to respond to some of the gaps in the aforementioned studies, the main question of this study is to propose a model that evaluates aspects of the environmental variable in the purchase of beef. The research problem seeks to answer how the perception of sustainability, product involvement and concern over the production process influence the consumer in their intention to buy in relation to a "sustainable" product.
As its general objective, this study intends to propose a model that evaluates the influence of the environmental factor on the attitude, purchasing intention and willingness to pay for beef, as well as identifying the degree of consumer product involvement, and concern over the production process, with brand equity, safety and the willingness to pay for a sustainable product in the consumer's attitude.

2 Literature Review

In the literature review, a survey was carried out covering topics directly related to the views of the consumer on product involvement, concern over aspects of sustainable meat production, brand value and attitudes towards sustainable consumption. These themes will serve as a basis to help build the structural model to be proposed in this study.

2.1 Product involvement

Product Involvement is an issue which is addressed in consumer research. Seminal work on the scale of measurement for consumer involvement was carried out by Laurent and Kapferer (1985) and by Zaichkowsky (1985) and has garnered increasing acceptance from several researchers.

In 2007 Barcellos carried out a study based on the scale of Jain and Srinivazan (NIP). The author states that consumers who are more involved with beef tend to choose purchases less out of habit than those less involved, since the former use a greater amount of cognitive resources at the time of the decision. With beef consumption, the more involved consumers would tend to "think" more about their behaviour (which brand to buy, which cut would be more appropriate, in what way it should be prepared, etc.), while the less involved consumers would consume more out of habit, in a less thoughtful manner.
The study by Verbeke and Vackier (2004) also used the Profile of Laurent and Kapferer (1985) as a basis in order to treat consumer involvement as a multidimensional construct. High involvement leads the consumer on an intense search for information, and then, careful processing of this information, evaluating and balancing the attributes of the product before forming belief in and developing an opinion regarding their intention to purchase the product. An increased interest in agricultural ecology, animal welfare and healthy consumption makes food products a particularly interesting area for research on the theme of product involvement. The perceived risk makes food, especially beef, a product of interest in the study of the level of consumer involvement, as a bad choice could lead to health problems. Verbeke and Vackier (2004) further suggest that "all consumers, regardless of their level of product involvement, are interested in the tangible quality attributes (taste) whilst those highly engaged may still demand intangible attributes (e.g., quality assurance or stamps)". Consumers with low involvement ("indifferent meat consumers") are more concerned with tangible attributes such as price, while those more involved also seek authenticity and quality assurance. New websites and applications have emerged to meet the consumer demand for a better understanding of the different aspects of beef, which clearly demonstrates a greater interest in consumer involvement with this product. This study aims to observe the influence of product involvement on consumer attitudes and meat purchasing intentions. Based on the aforementioned studies, we propose the following hypotheses:
H1a: Product involvement (beef) is positively related to consumer concern over the production process;
H1b: Product involvement (beef) is positively related to attitudes towards sustainable consumption;
H1c: Product involvement (beef) is positively related to brand equity;
H1d: Product involvement (beef) is positively related to the purchasing intentions of the consumer.

2.2 Concern Over the Production Process
Products with attributes obtained through sustainability processes and supply chain practices are distinguished by their attributes of credibility and characteristics that members of the supply chain cannot readily discern by examining or consuming the product (Golan et al., 2004). Attributes related to credibility are both physical and process-related.
Grunert, Bredahl and Brunsø (2004) states that consumer concern over the way food products are produced has increased in recent years throughout most of Europe. There are three main areas of interest: interest in organic production, interest in animal welfare and interest in products manufactured in a more "natural" way, that is, without the use of advanced technology. Quality related attributes of the production process basically have a ‘belief’ factor, as the consumer will barely evaluate the conditions mentioned in the production of meat. During a study carried out by Grunert (1997) on organic pork, the consumer inferred positively on organic meat referring to concern over the environment, health, as well as animal welfare and a better taste. This study clearly shows the pitfalls of positioning a product in the market based on aspects of the production process, in which the effects of these factors on product quality are unclear to the consumer. Aspects of the production process can "influence the creation of

expectations of quality more as an indicator of overall quality than as a singular attribute" (Grunert, 1997).

Chini (2015) sought to investigate consumer values on animal production as well as expert opinions on how beef produced in pasture areas could be a differential. The signal attribute, animal welfare, was much discussed in this work, this being an attribute directly related to the production process of the meat. In this case, the animal raised on pasture represents animal welfare.

Another study that addresses animal welfare, BEA, was carried out by Souza, Cassoti and Lemme (2013) to better understand the reactions of consumers to the mistreatment of animals in the industrial processes of meat production, which can cause pain, suffering and stress. The study shows that, generally, consumers are unaware of management standards in meat production and that around 87% of respondents have difficulty connecting the food they consume to the living animal. Even with meat being considered a commodity, some countries have labelling schemes. The main criteria certified in these schemes include herd tracking, guarantee of origin, employee management, food safety and hygiene, and animal welfare, among others.

Some studies have discussed the level of knowledge that consumers have on the food production process, within the boundaries of different constructs. Hanf and Kuhl (2005) argue that quality, in consumer understanding, is a construct with multiple attributes and they consider orientation through the process as one of the main dimensions of the quality control system, i.e., the production system as a whole must be explicit: “from farm to fork” (Hanf & Kuhl, 2005).

When the consumer considers food safety, they think of the production process. The study by Oliveira and Spers (2018) sought to understand the degree of consumer knowledge on issues related to the production process. Four aspects were used to evaluate and measure the "Perceptions and Attitudes Facing Food Production Processes" construct: Animal Welfare, Traceability, Socioenvironmental Responsibility and the willingness to pay of consumers of products with these attributes. The proposed model will address the first three aspects. Based on the aforementioned studies, the following hypotheses are proposed:

H2a: Concern about the Productive Process is positively related to the attitude towards sustainable consumption.

H2b: Concern about The Productive Process is positively related to brand equity.

2.3 Attitudes towards sustainable consumption

Attitudes can be used to predict and anticipate behaviour, making their study highly relevant to consumer behaviour research, and Silva, Lima Filho and Freire (2015) sought to know the behaviour of consumers of Brazilian beef in regard to the aspect of environmental sustainability. In this study the authors analysed the influence of environmental awareness and attitudes towards sustainable consumption on intentions to buy environmentally sustainable beef. Among the results of this study, Silva et al. (2015) observed that the level of environmental awareness influenced the intention to buy meat both directly and indirectly, being mediated by the attitude of the consumers; the attitude also positively influenced purchasing intentions. That is, consumers with greater environmental awareness are more likely to have a positive attitude toward sustainable consumption. Moreover, those who possess this positive attitude are more likely to intend to consume meat with environmental sustainability attributes.

By studying the consumption of sustainable dairy products of 456 young people in Belgium, Vermeir and Verbeke (2008), based on the Theory of Planned Behaviour (TPB), identified which attitude was one of the factors that could explain the intention of sustainable food consumption. Barcellos (2007) used TPB as the basis of her model as well, this confirmed the

direct and statistically significant relationship between attitude constructs and behaviours of beef consumption.
Therefore, based on the aforementioned studies, we propose the following hypothesis:
H3: The attitude towards sustainable consumption is positively related to the intention to buy sustainable beef.

2.4 Brand and Safety

According to Aaker (1996), perceived quality is one of the main aspects of Brand Equity, and has been associated with price premiums, price elasticities and continued brand use. The subject of branding has gained relevance in recent years in the field of agricultural commodities, particularly when the consumer is faced with making choices between similar products. By identifying reliable products, through known brands, with which they themselves identify, the consumer is able to make what they see as an advantageous purchase (Hanf & Kühl, 2005).
The joint actions of strong brands, at different levels of the production chain, can add value to the final product in terms of the consumer's perception of intangible attributes (such as food safety, traceability, and other attributes of trust) linked to the brand.
The production and industrialisation sector of the food industry has gone through successive credibility crises due to product contamination, and so the notion of Food Safety has gained strength. Food safety has been the object of interest of several economic agents and some NGOs, who emerge as agents of pressure on the institutional environment, with the fear of a risk to their health down to the consumption of adulterated or contaminated foods (Spers 2003).
Some surveys indicate that the food choices of consumers have been more influenced by concerns about the impact of food systems on human health - Food Safety. The perception of a food as safe appears to be a strong requirement in the choice of a product. Traceability during the different stages of the meat production chain is seen as a way of making the "quality" of the product more tangible (Oliveira and Spers, 2018).
Oliveira and Spers (2018) also mentions that crises as well as a lack of trust in product quality and safety have heightened consumer concerns about the purchase, consumption experience and trust attributes of food products. Faced with the difficulty of evaluating the products that they consume first-hand, consumers began to worry about questions such as the metaphysical attributes on top of the other factors related to the risk of the products.
Grunert et al. (2004) also emphasises the importance of the brand as a way of minimising consumer uncertainty at the time of purchase. "The company can signal a product of superior quality, reduce the uncertainty of the consumer and encourage them to pay a premium price for superior quality" Grunert (2004).
The presence of the Federal Inspection Service (FIS) meat stamp was associated with the safety of the product by those interviewed in the Barcellos study (2007), while the certification stamps are associated with higher meat quality. The FIS stamp is usually present on the packaging and on the meat itself, meaning that it comes from animals that have been slaughtered in FIS-enabled slaughterhouses.
Chini (2015) carried out 52 interviews with Brazilian and US consumers using laddering interviews and the results showed that, for Brazilians, the safety aspect was the most important result of the concern over health and food safety issues. These results demonstrate the importance of the safety related attributes when purchasing beef.
Given the above, this study considers both the safety factor and confidence in the meat as important elements of the brand and these factors will be evaluated both in brand equity and trust in the brand regarding food safety aspects.
Based on the aforementioned studies, the following hypotheses are proposed:
H4: Brand equity is positively related to the intention to buy sustainable meat

Based on the findings of the literature review, in which numerous studies related to the food sustainability theme were investigated, especially those in the beef chain, the structural model shown in Figure 1 is suggested.

This model shows that greater involvement of consumers in the selection and production of food, leads to greater interest in the food production process, resulting in higher brand equity. This then leads to the consumer having a positive attitude towards sustainable consumption as well as to them being more likely to consume a sustainable product bearing the brand entailing food safety. Consumers who value both the brand and food safety are therefore more likely to have a positive attitude towards sustainable consumption. Furthermore, those who possess this positive attitude are more likely to intend to consume beef with the attributes of environmental sustainability.

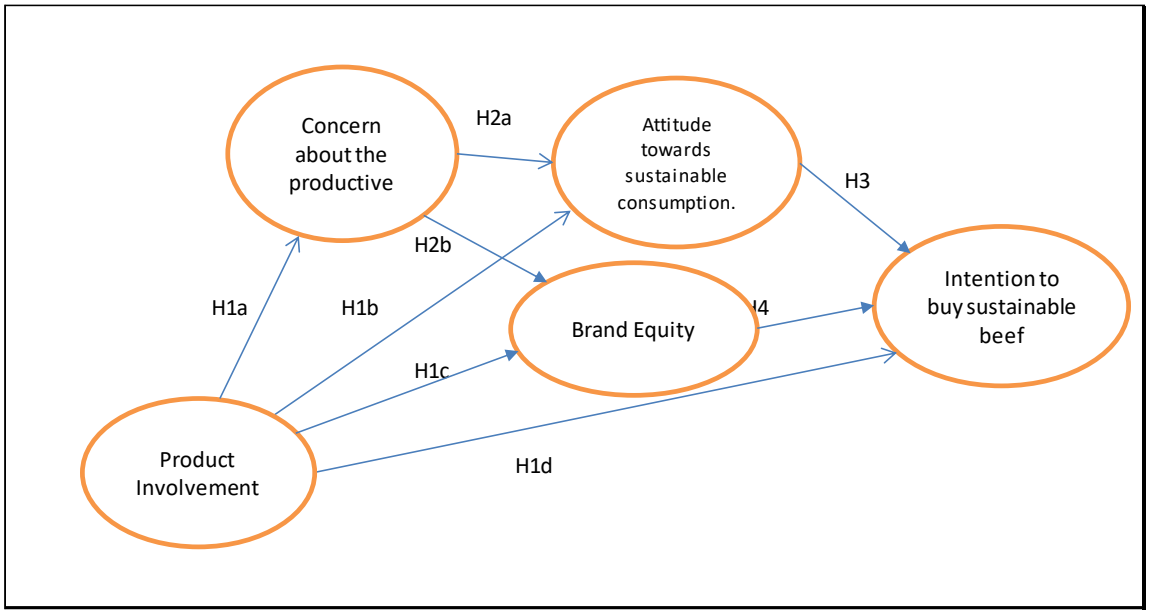

Figure 1 – Proposed Structural Model
Source: by the authors

3 Methods

This study adopted an exploratory sequential mixed method (CRESWELL, 2014) because the results of one step served as a substrate for the following steps. We justify conducting mixed methods by the inability of a data source to provide a complete solution to the problem being discussed (Creswell & Clark, 2011).

In a first approach, qualitative, in addition to the usual literature review, we conducted five in-depth interviews with specialists in the area of sustainability and marketing of the beef production sector with the purpose of mapping relevant issues related to the intention to buy sustainable meat, as well as establishing its nomological network.

We conducted a second qualitative study, this time using two focal groups of eight participants each, to test the validity of face and content of the constructs (concern with the production process, product involvement, brand equity, attitudes towards sustainable consumption and the intention to buy sustainable meat), and their respective dimensions, as well as the nomological network proposed by the research from the academic literature, the technical standards of the meat sector and interviews with specialists.

Each group represented an important segment of meat buyers identified during the first phase of the study. In the former there were consumers with functional buying habits, that is, individuals who buy meat for daily consumption in regular meals. The second contained clients

of a meat boutique in the city of São Paulo, who had the habit of buying meat for special occasions, such as barbecues.

We tested the process of choosing the two groups using 16 hypothetical products that combined four attributes of meat sustainability, which were formulated from a review of the literature and the interview with specialists, namely traceability, brand, quality and animal welfare. Everyone was given two possibilities of choice and was asked to justify why one option prevails over another. Product prices ranged from R $ 28.55 to R $ 53.03, per kilo.

In the third phase of this research we conducted a survey (n = 363) with the purpose of testing the reliability of the scales as well as their convergent and discriminant validities. We performed a confirmatory factorial analysis using variance-based structural equation modelling. Harman's single factor test was used to verify the existence of common method variance (Podsakoff & Organ, 1986).

We submitted the results of that survey to new confirmatory tests in another survey (fourth stage of the study) to rule out the possibility of influence of sample bias on the results. In the second survey (n = 362), in addition to the confirmatory tests already performed in the previous step, we tested the structural model using the SmartPLS-3.0 software (Ringle, Wende, & Becker, 2015) and 5000 sub-samples calculated automatically by the software.

Regarding the instrument, in addition to a specific section dealing with socio-demographic issues, there were five parts dealing with constructs of interest to the survey, all measured on a seven-point Likert scale, ranging from "strongly disagree" to "strongly agree ".

The first addressed questions related to product involvement (EP) and was formed by 14 questions divided into the dimensions of pleasure value (PRA), symbolic value (VSI), importance attributed to risk (RMI) and likelihood of risk (PRR) (Barcellos, 2007; Verbeke & Vackier, 2004; Jain & Srinivasan, 1990; Laurent & Kapferer, 1985).

The next section dealt with concerns about the production process (PPP) through 24 issues divided into animal welfare (BEA), traceability (RAS), legality (LEG), social responsibility (RSO), environmental responsibility (RAM) and health concern in the meatpackers (PSF). We developed this scale from triangulation of the literature review (Oliveira and Spers, 2018; Grunert et al., 2004; Grunert et al., 2011; Barcellos, 2007), the qualitative steps results, the EMBRAPA's (2011) standards of good agricultural practices, the Sustainable Cattle Raising Indicator of the Sustainable Livestock Working Group and the Rainforest Alliance (SAN, 2010).

The third part contained eight items and dealt with attitudes related to sustainable consumption (ACS) from the constructs general green products (PVE) and food products (PAL) (Roberts, 1996; Silva et al., 2015; Lages Neto, 2002; Bedante, 2004), followed by a section that addressed the one-dimensional construct intention to purchase, which was measured through five items (Silva et al., 2015; Tung, Shih, Wei, & Chen, 2012; Bedante, 2004).

The final section, composed of 16 items distributed in the dimensions of perceived quality (QLP), brand awareness (MBA), brand loyalty (LEA), brand global value (VGL) and security (SEG) (Yoo, Donthu, & Lee, 2000; Oliveira and Spers, 2018), measured the consumer's expectations regarding the meat brand (Brand). Further details on PPP and construct security in APPENDIX A.

We have submitted the instrument to an evaluation by five researchers (doctors and doctoral students) of the marketing area with experience in the subject of research and professional specialists of a certification company and the GTPS (Sustainable Livestock Working Group). In addition, we performed a pre-test with 40 individuals before the instrument was applied. As a result of this prior evaluation, we make adjustments in the statements of issues of the constructs concern with the productive process and brand equity.

We estimated the sample size previously using G Power 3.1.9.2 software, considering the ability to detect an average effect of 15%, the alpha error probability of 5% and a power of 95%, which resulted in a minimal sample of 334 individuals per study.
An electronic survey link was sent to more than 3,000 individuals registered in a Brazilian consumer database maintained by a market research firm. Filters to exclude consumers who rarely or not purchase meat were activated, as well as those individuals who did not eat meat were excluded as potential respondents.
A total of 795 questionnaires were collected, considering a safety margin for eventual losses related to the collection process (poor filling, incomplete filling and other problems inherent in the collection process). Of these, questionnaires that had a systematic presence of missing values or that were not completely filled were discarded. At the end, the two samples totaled 725 individuals. The remaining missing values, about 34 distributed in different questionnaires and variables, were filled with the mean.

4 Results

In this section the results are presented in four descriptive sections. The first deals with the findings in the qualitative stage of the study. Next, we present the confirmatory factorial analysis of two scales proposed by the study. In the third section, we evaluate the convergent and discriminant validity of the first-order constructs and the measurement model. Finally, we test the structural model.
Our sample was predominantly female (53% of women); 45% of respondents are single; concentrated age range between 21 and 40 years (70%); higher education, since more than 33% have postgraduate degrees and, when added to the 39% with a higher education, they reach 72% of the sample. The distribution of income was varied, with 40% having a monthly remuneration of R $ 1000.00 to 5000.00; 31% with remuneration of R $ 5000,000 to 10,0000 and 24% above R $ 10,0000 and only 5% below R $ 1000.00 monthly.
Another characteristic of the respondents that deserves to be highlighted is the fact that most of them buy meat for consumption on a daily basis. Being that 52% of the respondents buy meat just for day-to-day use; 24% for special occasions (barbecue).

4.1 Qualitative steps results

The experts interviewed indicated that in addition to the soft attribute consumers are worried about knowing the origin of the animal (traceability), and food safety. The meat brand helps the consumer to be more secure in purchasing a product of the desired quality, including a safer product from controlled farms. Animal welfare is seen as an important attribute mainly by consumers with greater involvement in the purchase of meat.
The relevance of the attributes varies according to the occasion of the purchase being different between the day-to-day purchase and the recreational purchase (barbecue). The price factor influences the choice of meat in day-to-day shopping, as stated by some focus group participants.
The results of the qualitative phase helped in the definition of some items of the questionnaire related to animal welfare, traceability, health concerns in the meatpackers, variables included in the new measurement scale of the PPP construct.
The presence of the federal inspection seal (SIF) was pointed out by the two focus groups as being one of the items observed at the time of purchase, proving Barcellos' observation (2007) as being this seal associated with meat safety. The brand has a relevant role in ensuring the origin of the meat. During the focus group discussions, we identified the enhancement of traceability as a means of conveying consumer confidence in food safety, as reported in the studies by Hanf & Kuhl (2005) and Oliveira and Spers (2018). Due to these findings in the qualitative phase, we have identified the need to include the security variable in the brand equity

construct since both are directly associated, in addition to the PPP scale and its dimensions, as already mentioned

4.2 PPP and brand Equity Confirmatory Factorial Analysis.
In order to test the adequacy of the scale of concern with the production process (PPP) and the new dimension "safety" of the brand equity construct proposed from the qualitative results of this research, a confirmatory factorial analysis was carried out from the scheme of factors of the PLS algorithm. This procedure was performed with two samples, drawn from the original sample of 725 individuals, in order to avoid the possibility of a false-positive factorial adequacy due to a possible sample bias. The results of the procedures are presented in Tables 1 and 2.

Table 1:
PPP Confirmatory Factorial Analysis

	Sample 1						Sample 2						
	BEA	RSO	LEG	PSF	RAS	RAM		BEA	RSO	LEG	PSF	RAS	RAM
BEA	**0.910**						BEA	**0.908**					
RSO	0.659	**0.959**					RSO	0.665	**0.949**				
LEG	0.757	0.788	**0.928**				LEG	0.701	0.841	**0.931**			
PSF	0.733	0.692	0.813	**0.915**			PSF	0.646	0.732	0.772	**0.919**		
RAS	0.664	0.582	0.627	0.654	**0.835**		RAS	0.575	0.611	0.674	0.653	**0.831**	
RAM	0.751	0.827	0.827	0.768	0.612	**0.950**	RAM	0.694	0.845	0.792	0.757	0.619	**0.944**
CR	0.951	0.978	0.961	0.954	0.902	0.974	CR	0.949	0.973	0.963	0.956	0.898	0.970
AVE	0.828	0.919	0.862	0.838	0.697	0.903	AVE	0.825	0.900	0.866	0.844	0.690	0.891

Note: the diagonals represent the root of the extracted variance.

We observed that in both scales the reliability and convergent / discriminant validity assumptions were respected in the two samples, since the extracted variances (AVE) are greater than 0.500, the composite reliabilities (CR) greater than 0.700 and the roots of the extracted variances exceed the correlations between the constructs and their peers (Fornell & Larcker, 1981; Hair et al., 2009). We obtained these results without the exclusion of items, which suggests that the proposed structure remains constant and adequate in different samples.

Table 2:
Brand Equity Confirmatory Factorial Analysis

	Sample 1					Sample 2					
	LEA	MBA	QLP	SEG	VGL		LEA	MBA	QLP	SEG	VGL
LEA	**0.913**					LEA	**0.891**				
MBA	0.671	**0.877**				MBA	0.661	**0.868**			
QLP	0.578	0.749	**0.917**			QLP	0.627	0.752	**0.943**		
SEG	0.655	0.580	0.532	**0.793**		SEG	0.626	0.555	0,.539	**0.782**	
VGL	0.777	0.592	0.596	0.635	**0.861**	VGL	0.789	0.594	0.578	0.649	**0.880**
CC	0.938	0.908	0.941	0.871	0.896	CC	0.920	0.902	0.960	0.862	0.912
AVE	0.833	0.768	0.841	0.628	0.742	AVE	0.794	0.754	0.890	0.612	0.775

Note: the diagonals represent the root of the extracted variance.

These results indicate, therefore, that the dimensions of the two scales can explain satisfactorily the variation of the items linked to them, as well as these are sufficiently different from each other, since their indicators have a more intense relation with the latent variable that is associated with than with the other latent variables of the scales.

4.3 Convergent and discriminant validity of first order constructs

Similar procedure to the previous section was adopted to attest the convergent and discriminant validity of the first order variables and the measurement model, however, with the use of the path weighting scheme, since all dimensions under study already have a structure consolidated factor. The results of this step are shown in Tables 3 and 4.

The results shown in table 3, related to sample 1, were obtained without the exclusion of items as a validity / reliability adjustment strategy. However, it was observed that two items of the product-involvement construct - EP09R "I have little to lose by mismanaging beef" and EP13 "I never know if I am making a good choice of meat" - of the dimensions importance of risk (IMR) and probability of risk (PRR), respectively, presented low factorial loads (0.248 and 0.480).

Table 3:

Convergent and discriminant validity of first order constructs - sample 1

	IC	BEA	IMR	LEA	LEG	MBA	PRA	PRR	PAL	PVE	QLP	RAM	RAS	RSO	PSF	SEG	VSI	VGL
IC	**0.873**																	
BEA	0.546	**0.910**																
IMR	0.218	0.217	**0.734**															
LEA	0.179	0.258	0.273	**0.913**														
LEG	0.535	0.756	0.226	0.305	**0.928**													
MBA	0.231	0.269	0.294	0.670	0.335	**0.877**												
PRA	0.077	0.065	0.360	0.228	0.097	0.273	**0.889**											
PRR	-0.155	0.070	0.291	0.375	0.206	0.460	0.436	**0.706**										
PAL	0.783	0.604	0.239	0.230	0.607	0.257	0.057	0.127	**0.859**									
PVE	0.674	0.636	0.248	0.301	0.705	0.328	0.076	0.211	0.795	**0.841**								
QLP	0.239	0.226	0.305	0.578	0.333	0.749	0.356	0.420	0.286	0.309	**0.917**							
RAM	0.591	0.750	0.197	0.327	0.827	0.310	0.059	0.105	0.653	0.742	0.242	**0.950**						
RAS	0.502	0.663	0.277	0.414	0.627	0.425	0.182	0.231	0.568	0.613	0.385	0.612	**0.835**					
RSO	0.470	0.659	0.220	0.358	0.788	0.334	0.170	0.171	0.523	0.661	0.272	0.827	0.582	**0.959**				
PSF	0.502	0.732	0.259	0.302	0.813	0.359	0.132	0.206	0.566	0.649	0.351	0.767	0.654	0.691	**0.915**			
SEG	0.248	0.300	0.273	0.654	0.344	0.577	0.233	0.260	0.289	0.340	0.528	0.368	0.453	0.374	0.309	**0.793**		
VSI	0.145	0.211	0.399	0.295	0.193	0.294	0.323	0.285	0.159	0.186	0.188	0.246	0.255	0.276	0.187	0.249	**0.939**	
VGL	0.227	0.271	0.304	0.776	0.295	0.590	0.236	0.309	0.260	0.311	0.596	0.348	0.415	0.336	0.334	0.634	0.223	**0.861**
CR	0.928	0.951	0.749	0.938	0.961	0.909	0.937	0.735	0.894	0.924	0.941	0.974	0.902	0.978	0.954	0.871	0.957	0.896
AVE	0.763	0.828	0.539	0.833	0.862	0.769	0.789	0.498	0.737	0.708	0.841	0.903	0.697	0.919	0.838	0.629	0.881	0.742
Mean	5.423	5.295	5.203	4.583	5.614	5.404	5.555	3.191	5.393	5.281	5.564	5.091	5.325	4.963	5.760	4.514	3.941	4.617
SD	1.448	1.662	1.366	1.711	1.550	1.363	1.494	1.461	1.403	1.398	1.207	1.742	1.423	1.793	1.461	1.449	1.884	1.574

Note: the diagonals represent the root of the extracted variance

In the second sample, we tested the measurement model again with the adoption of the same procedures, a priori without excluding the two potentially problematic items, to verify if the structure of the model remained constant. It was observed once again that the items had low factor loads (.008 and .291), which suggested that the indicators did not reflect, in terms of measurement, the dimensions to which they were associated. In this way, we opted for the exclusion of the items, thus achieving the reliability / validity indexes shown in table 4, referring to sample 2.

Table 4:
Convergent and discriminant validity of first order constructs - sample 2

	IC	BEA	IMR	LEA	LEG	MBA	PRA	PRR	PAL	PVE	QLP	RAM	RAS	RSO	PSF	SEG	VSI	VGL
IC	**0.898**																	
BEA	0.525	**0.908**																
IMR	0.251	0.163	**0.858**															
LEA	0.313	0.312	0.294	**0.891**														
LEG	0.532	0.701	0.208	0.349	**0.931**													
MBA	0.314	0.292	0.334	0.659	0.357	**0.868**												
PRA	0.245	0.111	0.423	0.346	0.215	0.396	**0.886**											
PRR	-0.26	-0.153	-0.388	-0.372	-0.213	-0.412	-0.513	**0.745**										
PAL	0.842	0.551	0.208	0.338	0.625	0.322	0.218	-0.264	**0.856**									
PVE	0.699	0.564	0.236	0.388	0.712	0.378	0.217	-0.270	0.790	**0.877**								
QLP	0.284	0.228	0.347	0.627	0.315	0.751	0.439	-0.446	0.311	0.328	**0.943**							
RAM	0.584	0.694	0.148	0.370	0.791	0.327	0.185	-0.223	0.662	0.791	0.292	**0.944**						
RAS	0.502	0.574	0.354	0.438	0.673	0.485	0.291	-0.327	0.549	0.630	0.514	0.618	**0.831**					
RSO	0.539	0.665	0.237	0.450	0.841	0.370	0.230	-0.257	0.626	0.709	0.316	0.845	0.610	**0.948**				
PSF	0.553	0.645	0.244	0.311	0.771	0.354	0.280	-0.254	0.603	0.665	0.355	0.755	0.652	0.730	**0.919**			
SEG	0.287	0.260	0.281	0.625	0.289	0.552	0.301	-0.336	0.329	0.419	0.536	0.352	0.446	0.350	0.292	**0.783**		
VSI	0.219	0.238	0.308	0.381	0.185	0.287	0.365	-0.324	0.210	0.246	0.261	0.258	0.267	0.304	0.176	0.393	**0.942**	
VGL	0.279	0.205	0.279	0.787	0.271	0.594	0.335	-0.324	0.307	0.363	0.578	0.301	0.374	0.364	0.265	0.649	0.322	**0.880**
CR	0.943	0.950	0.848	0.920	0.963	0.902	0.936	0.671	0.891	0.943	0.960	0.970	0.898	0.973	0.956	0.863	0.960	0.912
AVE	0.807	0.825	0.735	0.794	0.866	0.754	0.785	0.554	0.732	0.769	0.890	0.891	0.690	0.900	0.844	0.613	0.888	0.775
Mean	5.457	5.264	5.233	4.435	5.536	5.367	5.633	3.139	5.410	5.212	5.662	5.066	5.351	4.961	5.678	4.590	3.821	4.638
SD	1.518	1.682	1.611	1.751	1.642	1.466	1.469	1.390	1.435	1.554	1.242	1.798	1.405	1.783	1.485	1.472	1.974	1.700

Note: the diagonals represent the root of the extracted variance.

As the first-order constructs, the second-order constructs were submitted to tests to evaluate their quality of measurement in two samples. In addition, the discrimination tests were also used to verify possible multicollinearity problems among the predictors. Table 5 shows promising results regarding reliability and validity, as well as the low correlations between latent variables (<0.800), which suggest that there are no harmful linear relationships to the model.

Table 5:
Model Convergent and discriminant validity

Sample 1						Sample 2					
	ACS	EP	IC	Brand	PPP		ACS	EP	IC	Brand	PPP
ACS	**0.912**					ACS	**0.891**				
EP	0.455	**0.708**				EP	0.611	**0.723**			
IC	0.734	0.177	**0.873**			IC	0.770	0.318	**0.898**		
Brand	0.455	0.455	0.267	**0.842**		Brand	0.557	0.546	0.351	**0.842**	
PPP	0.770	0.276	0.598	0.444	**0.875**	PPP	0.779	0.343	0.619	0.459	**0.869**
CR	0.909	0.799	0.928	0.924	0.951	CC	0.885	0.812	0.943	0.924	0.949
AVE	0.832	0.501	0.763	0.709	0.765	AVE	0.794	0.523	0.807	0.709	0.755

Note: the diagonals represent the root of the extracted variance.

4.4 Evaluation of the structural model

The results of the structural model analysis indicate that all hypotheses were supported, with the exception of H4 (Brand-> CI). Table 6 shows that the sustainable meat purchase intention has about 60% of its variation explained by the predictors ACS (H3) and EP (H1d), and the effect of ACS (large,> 0.35) is about of 16 times that of PE. Although the direct effect of PE is small (<0.150), it is important to point out that its indirect effect exerts an important influence on consumers' purchase intentions through PPP (H1a, H2a) and, mainly, ACS (H1b).

Still on the relationship between PE and IC (H1d), it was expected that there would be a positive relationship between the constructs, however the results indicate that the greater (smaller) the

involvement with the smaller (greater) product will be the consumer's intention to buy. The same is true for H4, although the relationship was not supported, there is an inconsistency in the fact that the observed relationship was negative, since the original hypothesis suggested a positive relation. These two issues will be discussed in the next section.
Although the brand equity was not confirmed as a predictor of IC, the results showed that the construct is influenced directly by PPP (H2b) and by EP (H1c), the first one (f^2 = 0,277) being about twice as effective to generate brand value as the second (f^2 = 0.133).

Table 6:
Evaluation of the structural model

Hypotheses		Path Coefficient	f^2	VIF	Standard Deviation	T Statistics	P Values	R^2 Adjusted
H3	ACS -> IC	0.935	1.320	1.801	0.053	17.713	0.000	0.629
H4	Brand -> IC	-0.043	0.003	1.607	0.046	0.943	0.346	
H1d	EP -> IC	-0.231	0.082	1.771	0.059	3.885	0.000	
H2b	PPP -> Brand	0.308	0.135	1.133	0.046	6.744	0.000	0.379
H1c	EP -> Brand	0.441	0.277	1.133	0.047	9.313	0.000	
H1a	EP -> PPP	0.343	0.133	1.000	0.055	6.284	0.000	0.115
H1b	EP -> ACS	0.390	0.518	1.133	0.056	6.964	0.000	0.740
H2a	PPP -> ACS	0.645	1.418	1.133	0.042	15.395	0.000	

Thus, the consumer's involvement with the product leads him to attach more importance to the productive process of the meat, making his attitudes converge towards a more sustainable consumption and the union of these factors leads him to the intention to buy sustainable meat. In the next section, these results will be discussed based on the theoretical framework and the qualitative research findings.
Still on the relationships estimated in the structural model, it is important to emphasize that we performed tests to evaluate multicollinearity to corroborate the initial exploratory evaluation about possible problems in the model. The VIF values were all higher than 1, indicating the existence of regression values already skewed by multicollinearity, according to Bowerman and O'Connell (1990). However, these values are considered acceptable since values are less than 3 (Ringle, Wende & Becker, 2015). In general terms, this indicates that although there is a moderate correlation between the independent variables, the impairment of the analysis performed by the model is reduced.

5 Conclusions

The first relevant conclusion of this study was the confirmation of a scale that can measure items related to the production process. The scale developed with 6 latent variables and 24 items is adequate to measure the construct "concern with production process". The discriminant and convergent validations have attested the possibility of using these items in the measurement of this construct. Previous studies explore only some dimensions of the production process as observed in Oliveira and Spers (2018) and Barcellos (2107), that found animal welfare, traceability and socio-environmental responsibility as relevant in determining the consumer's concern with the production process. Some criteria used in socio-environmental certification standards (SAN, BPA, GIPS / GTPS) cover items related to good practices that were also evaluated in this study.
The "food safety" variable included in the Brand Equity construct was also validated in this work, which endorses the relation. The relevance of food safety in beef consumption was discussed in the study of Oliveira and Spers (2018) and Hanf & Kuhl (2005) that confirm the

relevance of the production practices oriented to ensure traceability, and the ability to transmit trust as an antecedent to food safety.

Results have confirmed seven of the eight hypotheses indicated in the proposed model. The involvement of the consumer in the choice and preparation of food increase the interest in the production process and the brand equity. This also leads the consumer to bearing a positive attitude towards sustainable consumption as well as being more likely to buy a sustainable product. Consumers with high brand equity and food safety (as found in Oliveira and Spers, 2018) are more likely to have a positive attitude towards sustainable consumption (found in this study) and with this positive attitude are more likely to have more intention to consume beef with environmental sustainability attributes.

It is noteworthy that the study confirms H1d, in which the involvement of the product influences the consumer's intention to buy, but inversely. The findings of the focus groups are in conformity with the results of Verbeke and Vackier (2004) by indicating that less involved consumers (in the case of the second FG) are more linked to tangible attributes, such as price, when compared to consumers with a higher degree of involvement (in the case of the first FG) that sought to guarantee more food safety, intangible attributes (as retail services) and flavor, instead of sustainability characteristics.

Previous studies have shown that the consumer is willing to trade-off sustainability items for flavor and tenderness. Considering that most of the respondents buy beef on a daily basis, as mentioned in the descriptive analysis, and according to both focus groups, these consumers seek to value the price more than other intangible attributes since they are less involved with the product, what explains the negative sign of this relationship. The rejected hypothesis refers to the relationship between brand equity and purchase intention that need to be validated by future studies, but one way of explaining this result refers to the fact that beef is still a commodity in Brazil and that brand value still does not affect the intention to buy, although there are significant investments in brand communication by companies such as Friboi, Maturata and Swift.

During the beef selection process, beyond intrinsic attributes (color, softness and appearance) consumers consider food safety attributes which include concern about the production process (including knowledge of animal origin). It is also observed that involvement with the product leads the consumer towards concerns with the animal's production process as well as with the brand influence regarding the attitude of purchase and the intention to buy a "sustainable" product.

This study indicates that the new conceptual model proposed, based on a theoretical gap, reveals important relations that contributes to the understanding of the environmental attributes influence on the attitude of purchase intention. The results found in the in-depth interviews and focus groups served to validate the relevance of the variables included in the proposed model. Involvement with the product and concern with the production process are related to attitude and intention to buy sustainable beef. However, brand value (including food safety) is correlated only with the sustainable consumption and is not related to the intention to buy sustainable beef.

This study also brings managerial contributions by indicating that there is a positive consumer perception to brands that contain socio-environmental attributes and the knowledge of production process. Both the food industry and retailers should consider a better explanation of attributes such as animal welfare, traceability, and social responsibility in their communication strategy to consumers.

The new model proposed in this study should be used as a reference for other researches dealing with socio-environmental topics, including other segments of the food industry in Brazil and for international and cross cultural studies. Empirical studies should be carried out in order to validate the suggested relationships between these dimensions. The use of the six variables that

form the construct "Concern as a Productive Process" (animal welfare, traceability, legality, social responsibility, environmental responsibility, sanitation in slaughterhouses) should also be tested with other consumers profiles.

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APPENDIX A

Table 7. PPP scale and brand equity security dimension

Construct	Dimension	Item
Brand	SEG	If beef is branded, then it is a safe beef
		There are no risks involved in the consumption of branded beef
		It is safer to eat branded beef
		I pay attention to food safety issues in choosing the brand
PPP	BEA	I am concerned if animals were created in a natural and free way
		I am concerned if animals received a humane and ethical treatment throughout their life
		I am concerned if animals received adequate feeding and sanitation.
		I am concerned if slaughter was carried out painlessly and according to animal welfare standards
	RAS	I only choose one beef when it is possible to identify its origin
		I try to choose foods that have guaranteed origin
		I try to choose food that can be traced back to its origin in case of any problems
		A traceable food is a safer food.
	LEG	I am concerned if producers and meatpackers follow labor standards .
		I am concerned if producers and meatpackers use child labor or forced labor
		I am concerned if producers work within the legality
		I am concerned if meatpackers work within the legality
	RSO	I am concerned if producers and meatpackers worry about benefits to officials and families (health plan, early childhood education)
		I am concerned if producers and meatpackers promote development of communities
		I am concerned if producers value hiring and training of local labor
		I am concerned if meatpackers value hiring and training of local labor
	RAM	I am concerned if producers adopt practices that reduce greenhouse gases emission
		I am concerned if beef comes from farms that have not had deforestation
		I am concerned if beef comes from farms that conserve water and avoid its waste
		I am concerned if beef comes from meatpackers that conserve water and avoid its waste
	PSF	I am concerned if beef comes from meatpackers properly inspected by health authorities
		I am concerned if beef comes from meatpackers that have good hygiene practices in relation to slaughter environment and machinery
		I am concerned if beef comes from meatpackers that take care of the hygiene of employees (uniforms) and of instruments used
		I am concerned if beef comes from meatpackers that have waste and effluent control