ARTICLES

BRAND EQUITY IN AGRIBUSINESS: BRAZILIAN CONSUMER PERCEPTIONS OF PORK PRODUCTS

Brand equity no agronegócio: Percepção do consumidor brasileiro de carne suína

Brand equity en la agroindustria: Percepciones del consumidor brasileño de carnes porcinas

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ABSTRACT

Even sectors that usually offer similar products, such as agribusiness, can develop brand strategies that are potentially capable of promoting a greater perceived value in the eyes of consumers. This paper discusses how the origin of product, perceptions, and attitudes of Brazilian high-income consumers concerning food production processes, and brand equity assigned by consumers to certification processes affect the formation of brand equity in agricultural commodities.

KEYWORDS | Consumer behavior, brand, marketing strategy, agricultural commodities, pork.

RESUMO

Até mesmo setores que geralmente oferecem produtos com um alto grau de semelhança, como é o caso no agronegócio, podem desenvolver estratégias de branding, que são potencialmente capazes de promover um maior valor percebido por parte dos consumidores. Este artigo discute como a origem dos produtos, as percepções e atitudes dos consumidores brasileiros de alta renda sobre os processos de produção de alimentos e o valor de marca atribuídos pelos consumidores aos processos de certificação afetam a formação de brand equity em commodities agrícolas.

PALAVRAS-CHAVE | Comportamento do consumidor, marca, estratégia de marketing, commodities agropecuárias, carne suína.

RESUMEN

Aun sectores que generalmente ofrecen productos semejantes, tales como la agroindustria, pueden desarrollar estrategias de marca que son potencialmente capaces de promover un mayor valor percibido a la vista de los consumidores. Este estudio analiza cómo el origen del producto, las percepciones y las actitudes de los consumidores brasileños de alto poder adquisitivo con relación a los procesos de producción de alimentos, y el brand equity asignado por los consumidores a los procesos de certificación, afectan la formación del brand equity en los commodities agropecuarios.

PALABRAS CLAVE | Comportamientos del consumidor, marca, estrategia de marketing, commodities agropecuarios, carne porcina.

INTRODUCTION

Concerns regarding the use of consumer-oriented production systems are common in many areas of economic activity (Jaworski & Koli, 1993). To some authors, this is a potential source of competitive advantage and a major force in shaping organizations' marketing activities (Hanf & Kühl, 2005), including those in the field of agribusiness.

In agribusiness, differentiation can be seen as the organizations' strategy to achieve leadership in their field through the introduction of quality attributes in their products or services (Saes & Spers, 2006). By introducing or highlighting attributes that are desirable in consumers' eyes, higher fidelity can be achieved, thus facilitating the entry of the company and its products to niche markets that are more profitable. Some attention has been directed to the study of confidence attributes and how actual consumer perception encourages the implementation of branding strategies (Oliveira & Spers, 2011).

According to Ramirez (2013), consumers tend to adopt green and environmentally responsible products based on their personal preferences and perceptions of producers' credibility. Therefore, adoption is enhanced when marketers show competence by clearly stating the attributes that differentiate products and their benefits.

The study of high-income consumers is especially interesting. Growing income levels in developing countries have resulted in diet upgrades with increased demand for meats, dairy products, and other higher-value food products (Regmi & Gehlhar, 2005). Increasing affluence has coincided with growth in sales of labor-saving and specific food products. As the food marketing and retail sector evolves in middle-income countries, they undergo a "shift from commodity markets to product markets" (Reardon & Timmer, 2007). It is expected that the study of high-income consumers may point to future trends in the evolution of the buying behavior of "regular" consumers. Furthermore, high-income consumers are better educated, less sensitive to higher prices, and more open to differentiated products with higher quality and prices.

Extrapolating for countries, Regmi, Takeshima, and Unnevehr (2008) found a high degree of convergence in global food systems, with middle-income countries appearing to be following trends set by high-income countries. Convergence was found to be more apparent in most important food-expenditure categories and in indicators of food-system modernization, such as supermarket and fast-food sales.

For Stanton and Herbst (2005), companies producing agricultural commodities need to adapt to consumers' changing demands, particularly those who are increasingly ready to use such products. However, consumers have little knowledge about the mode of production. Thus, the purchase decision becomes increasingly complex and difficult. According to these authors, this scenario provides opportunities for the use of branding strategies as brands act as quality indicators, signaling worthwhile purchases, and facilitating decision-making. Most food products can be classified as agricultural commodities, including various types of meats, grains, and lightly processed vegetables. The process of branding for these products, understood as the process of creating and strengthening brands, is a reality that has gained importance over the past decades (Kaufman, Handy, McLaughlin, Park, & Green, 2000).

Measurement of brand value (brand equity) is a topic that has been researched extensively and several authors have proposed models for its estimation (Aaker 1998; Keller 1993; Yoo Donthu, & Lee, 2001). According to Keller (1993), brand equity can be defined as the marketing effects attributable to the brand only. The same author proposes the concept of consumer-based brand equity, which can be defined as the differences in consumer response to marketing actions conducted by a given brand, attributed to prior knowledge of this brand, in comparison with a fictitious or non-existent brand.

Other attempts to develop brand equity measurement have also taken into account the market performance of the brand. Huang and Sarigöllü combined survey data with real market data and proposed two types of brand equity measurements: customer mind-set measures (involving brand knowledge and more directly related to Aaker's initial propositions) and product-market performance measures. The results of the customer measurements confirmed that they captured the effects of the brand-building processes, while the market effects measure (the revenue premium consumers are willing to pay because of the brand) seems to be a better choice for the continuous tracking of brand equity because it is a more accurate and practical measure.

Another interesting point addressed in the behavior of brand equity is its relation with country-of-origin effect (COO). Kakati and Choudhury (2013) conducted a study in India with consumer durables companies. They compared local brands to global brands using Keller's (2003) consumer-based brand equity model. The results revealed that the strength of global brands is much higher than Indian brands. Indian brands scored significantly less for "brand preference" and consequently "brand strength" was much lower than that of global brands. This appears to indicate that COO probably has an influence on brand equity.

Regarding the research on this subject in Brazil, some insightful papers have been produced. Spers, Zylbersztajn, and

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Lazzarini (2003) studied the influence of formal and informal factors on consumer perceptions of food quality and safety mechanisms. As informal mechanisms, the brands are pointed by the authors as being the main action to be conducted by companies to establish effective relationships and generate value for their products. This is especially true for issues, such as the origin, quality, and other product benefits. For the formal mechanisms, governmental norms and regulations on the production processes appear as the main force that influences quality perception by consumers. Consumers ordered their preference based on whatever factors gave them a greater or lesser perception of safety and quality: firstly, effective governmental inspection (42.05%), followed by price (29.66%), and brand awareness (28.9%). Greater the brand awareness and value attributed to the rigor of inspection, greater is the perception of quality. There is a perception of consumer restriction on high prices – above a given price threshold, consumers fail to relate a higher price with quality.

In an interesting study with consumers from São Paulo state in Brazil, Cunha, Spers, and Zylbersztajn (2011) assessed their real perception of "sustainable" labeled products. The products were chosen from retail establishments that had a label of "Guarantee of Origin" (GO) and were selected because they have suppliers committed to environmental and social concerns (Zylbersztajn, Spers, & Cunha, 2009). The consumer clearly understood that GO is a differentiated product, with a greater appeal for food safety and environmental preservation and is independently certified.

Guilhoto (2001) made an interesting review of the effects of the COO on consumer's perception of quality. The author pointed out that culture is one of the moderating factors on the acceptance of products of foreign origin and that segmentation based on cultural traits can be more effective than segmentation by geographical or political borders. The image of the exporting country is transmitted to its products and a country with a favorable image tends to have its products better accepted. For companies that operate in countries where the COO is unfavorable, it is advisable to adopt strategies that minimize this negative impact. Guilhoto (2001) suggests the construction of a stronger brand, establishment of a price that matches the value consumers attribute to the product, and to establish partnerships in the supply chain to build a sufficiently strong and structured distribution process.

Measuring brand equity of agricultural commodities is necessary. However, there are no methodological proposals in literature for it. Therefore, the research hypotheses outlined here considers what Stanton and Herbst (2005) pointed out: aspects related to quality are closely linked to the creation and promotion of brands in the agricultural commodities industry and that other factors, such as food safety, product origin, presence or absence of certifications (how consumers interpret and evaluate them), and consumers' knowledge about production processes influence their perceptions and attitudes. All these points are discussed in detail later in this paper.

Thus, the objective of the research is to assess how the following factors affect the formation of brand equity in agricultural commodities: 1) origin of product, 2) perceptions and attitudes of consumers regarding food production processes, and 3) brand equity assigned by consumers to certification processes.

RESEARCH HYPOTHESES

Of particular interest in this study are the factors influencing high-income consumers' brand equity evaluations and how these factors influence attitudes toward agricultural commodities. This paper includes evaluation of willingness to pay (WTP) higher prices for products that have different attributes, in this case, products with certifications regarding quality and traceability. The research studies how high-income consumers evaluate the above constructs, using pork consumption as the research object. Figure 1 illustrates the explanatory theoretical model used to test the hypotheses.

It is speculated that more positive the image that high-income consumers hold of the origin of pork products, the higher (or more positive) will be the brand equity, as well as consumers' attitudes toward food production processes. Additionally, consumers will assign a higher value to certified brands. Some studies have already correlated brand value with the COO (Han & Chu, 2010) but few articles have assessed the interaction between this construct and brand equity. This work aims to extrapolate the concept of COO to the origin of the domestic or imported product itself.

> H1a: Positive perceptions of the origin of pork products are positively related to the formation of perceived brand equity.
>
> H1b: Positive perceptions of the origin of pork products are positively related to favorable perceptions of and attitudes toward food production processes.
>
> H1c: Positive perceptions of the origin of pork products are positively related to the brand equity attributed by high-income consumers to certification processes.

Figure 1. Proposed explanatory theoretical model
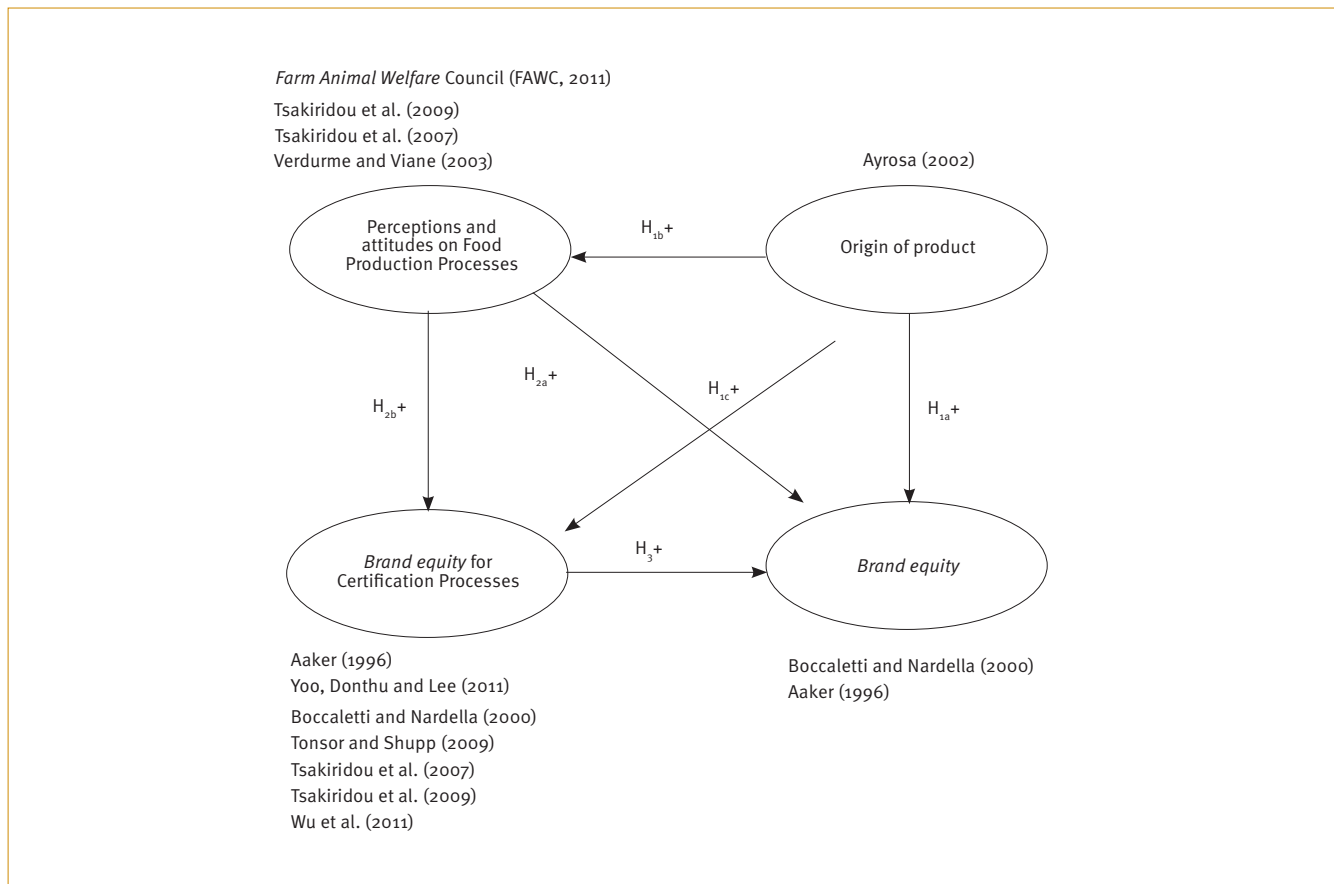
To test these hypotheses, we decided to introduce an adaptation to the COO construct for evaluating the origin of pork products (domestic *versus* imported). We also included an adaptation of the scale developed by Ayrosa (2002) to assess Brazil's image to match it to the target product of this study. Instead of evaluating the perception that foreigners have of Brazil and Brazilian products, we measure the image that Brazilian high-income consumers have of pork products originating from their own country *versus* imported products. The questionnaire focused on two distinct aspects: consumption of meat produced in Brazil and consumption of imported meat. A similar approach has already been employed to evaluate the influence of the image held by Chinese consumers of domestic manufactured products on their willingness to buy them (Chao, Seeman, & Grein, 2010).

It is believed that there is a positive relationship between consumers' perceptions and attitudes regarding food production processes (animal welfare, traceability, sanitation, and social and environmental responsibility) and the brand equity that consumers attach to the certification processes, as well as the

brand equity that high-income consumers develop for a given product.

> H2a: Positive perceptions of and attitudes toward food production processes are positively related to the formation of brand equity.

> H2b: Positive perceptions of and attitudes toward food production processes are positively related to the brand equity attributed by high-income consumers to certification processes.

Some studies have evaluated the degree of consumers' awareness concerning aspects of food production processes, organic mode of production, genetically modified foods (GMF), traceability, animal welfare, influence on constructs such as WTP, and perceptions and attitudes toward such products (Tsakiridou, Mattas, & Mpletsa, 2009; Tsakiridou, Tsioumanis, & Papastefanou, 2007; Verdume & Viaene, 2003). However, few studies have addressed the direct relation between these constructs and

brand equity. Moreover, there have been instruments to measure brand equity changes due to the presence of a certification seal or certificates. It is postulated that higher the brand equity assigned by high-income consumers to the presence of a certification seal or certificates, the greater will be their perception of food safety regarding the consumption of this product. Therefore, consumers will assign a greater value to these brands.

> H3: The brand equity assigned by high-income consumers to the certification process is positively associated with the formation of brand equity.

Following the adaptation of a model proposed by Yoo et al. (2001), we employed three different dimensions to assess brand equity assigned by high-income consumers to certified brands: *perceived quality* (intrinsically linked to the issue of food security), *differentiation of value* (involving consumers' willingness to pay a differentiated price for the product (WTP), the perceived value, and the status associated with the consumption of this product), and *total brand value*. We used the scales originally developed for measuring brand equity by Aaker (1996) after adapting it to the case of pork and related brands. We included questions and/or adapted the questionnaire to ensure that the brand certification processes were also considered.

Operationalization of constructs

In the following section, all constructs used in the proposed model are presented with a brief explanation on how they were operationalized.

Origin of product

The country of origin (COO) is the place where a product is made, usually given by the expression "Made in (name of country)." In today's globalized market, consumers have access to products from different countries and can easily acquire information about these products. Thus, comparisons between different sources of origin, formerly more difficult, can now easily be undertaken through comparisons of price, quality, and other characteristics. It is believed that COO is one of the most important clues employed by consumers in their evaluation of product quality and therefore, a strong component in the purchase decision (Ahmed & D'astous, 1996; Ahmed, Johnson, Ling, Fang, & Hui, 2002).

Giraldi (2006) comments that the COO construct is developed from the idea that people have stereotyped views about other people and countries, and consequently the

products manufactured in these countries (Balabanis, Mueller, & Melewar, 1999). To some extent, these stereotypes can transcend the evaluations of specific brands or products and determine purchase intentions and people's behavior. The same author quotes several papers published in Brazil on COO and consumer attitudes toward certain products. These include Ayrosa (2002), Carvalho (1993), Chong (1993), and Vazquez (1994).

Another interesting aspect of COO brand reputation is the presumed predisposition of consumers to pay a differentiated price for products with warranty. Koschate-Fischer, Diamantopoulos, and Oldenkotte (2012) performed three experiments, changing the COO (favorable vs. unfavorable) and the brand familiarity (high vs. low). The results of their experiments reveal that COO does have a positive impact on consumers' WTP.

Kim (2008) conducted an interesting study on the behavior of Japanese pork consumers, analyzing the trade-offs between price and intrinsic and extrinsic "tips" of product quality. The influence of COO on purchase decisions could widely be observed. The results show that Japanese consumers rely heavily on COO as an indicator of quality when buying meat. When consumers face a situation where they are forced to evaluate the trade-off between different quality signals (or consumption "tips"), both extrinsic and intrinsic, they seem to rely more heavily on a specific extrinsic signal – COO. This may suggest that consumers use this particular information as a risk reduction strategy.

In our study, a comparison is made between the image that consumers have of pork products produced in their own country and abroad (hypothetical country). This choice is justified by the difficulty encountered in exploratory qualitative interviews, conducted in the initial stages of this research, and used as the basis for the development of the questionnaire employed at a later stage. In these interviews with Brazilian consumers, the difficulty of realizing a crossover study involving pork produced in other countries became evident. Both in Brazilian and international markets, there are no clear signs of origin for pork. Therefore, we decided to examine the effect of consumers' views of their own country and how these could be applied to this product category. An adaptation of the scale originally proposed by Ayrosa (2002) for the measurement of COO was adopted in this survey.

Perceptions of and attitudes toward food production processes

Several studies have considered the degree of knowledge that consumers have about food production processes, linked to the measurement of different constructs. As previously discussed,

perceptions of food safety are included within the assessment of consumers' WTP a premium price for different foods and the acceptance of genetically modified foods (GMF), among other aspects. However, perceptions of food safety have not yet been accessed independently as an isolated construct. Although some reports, such as that of Boccaletti and Nardella (2000), have specifically quoted this measurement in their questionnaires, this type of evaluation is often relegated to a second-level condition, used to corroborate and support the measurement of better-established constructs.

More recently, Weinrich, Kühl, Zühlsdorf, and Spiller (2014) have pointed out that in Germany milk and milk products are increasingly advertised with additional features for product differentiation. Differentiated traits include freeness from genetic modification, fair payment for dairy farmers, regional origin, quality attributes, and environmental and animal welfare. Milk consumers tend to value fresh and aromatic taste, safety, high nutritional quality, a proper price–quality ratio, and a subjectively appropriate price.

The choice is made to address food safety as part of the construct "Perceptions of and Attitudes toward Food Production Processes," but in a separate section of the questionnaire. This choice is justified by the intention to take the example of pork and postulate a generalization that applies to all agricultural commodities. The subject is treated independently in the questionnaire, without mentioning the specific product. Thus, we assess the degree of consumer knowledge on food safety along with issues, such as animal welfare, traceability, and socio-environmental responsibility. These items were combined to assess the impact of food production on consumer health issues and the environment.

We also included themes, such as product certification, government regulation, ethics concerning the treatment of animals intended for human consumption, and food security in the questionnaire. We wanted to generate data applicable to similar studies for different agricultural commodities.

Four dimensions were used to evaluate and measure perceptions of and attitudes toward food production: animal welfare, traceability, social and environmental responsibility, and the WTP of consumers for different prices of products with these characteristics.

Brand equity of certification processes

The work of Aaker (1996) "Measuring brand equity across products and markets" has been applied in many different situations. This study also applies the concept to quantify the value that consumers attach to brands of pork products and to accompanying seals and certificates.

As trust attributes are increasingly being valued within the field of food production, companies and brands involved in this activity should pay attention to the effective delivery of value along the entire supply chain engaged in their production (Hanf & Kühl, 2005). Today, the effective measurement of brand equity for food and agricultural commodities assumes an unprecedented importance.

The fact that consumers are increasingly valuing "safety" certificates is exemplified by the case of traceability. Lilavanichakul and Boecker (2013) performed a study on consumer acceptance of a new traceability technology – internal tagging – added substances that act as tracers. Consumers tend to be suspicious of the introduction of new substances in food. However, this research showed that consumers accept products with added internal tags and prefer a regional brand over a national one. This indicates that concerns with safety surpass consumers' natural fear of new technologies.

Seals and certifications of origin, food security, and unique characteristics of products (free of pesticides and specific contaminants, specific geographical origin, or a specific production process) are understood by the market to be increasingly valued by consumers. Nevertheless, studies indicate that the degree of consumers' awareness of certifications is below desired levels (Boccaletti & Nardella, 2000; Botonaki, Polymeros, Tsakiridou, & Mattas, 2006).

The models proposed by Aaker (1996) and Yoo et al. (2001) for measuring brand equity have some shortcomings for certification brands. Many of the dimensions used are difficult to detach from the case of "real" and tangible products for which they were designed. Qualitative interviews with consumers aimed to identify some of these issues and attributes that come to consumers' minds when they were asked about food seals and certificates. The interviews demonstrated that questions related to the marketing mix have no particular importance in this specific situation. However, to the respondents, the question of quality played a decisive role in consumers' WTP when faced with a premium price for a product differentiated by the presence of a seal. The value added to the final product by the presence of a seal or certificate was also clear in the statements of the interviewees.

There are five dimensions involved in the determination of brand equity as presented by Aaker (1998): loyalty, perceived quality, brand association and differentiation, brand knowledge, and brand market behavior. Among these, the one with greater affinity to certification brands (according to results of qualitative interviews and literature review) is perceived quality. Some issues related to loyalty

(consumer experience and recommendation to others) and other related associations and differentiation measurements (especially those related to organizational associations and differentiation) are adequate for the quality dimension. This is explained by the nature of certification brands, which is usually created and promoted by entities independent of the owners of final branded products and involves the issue of differentiation.

The problem of adapting brand equity measurement to a certification brand remains, given the subjectivity inherent in such kinds of branding. However, the scale for total brand value proposed by Yoo et al. (2001) may be used, if necessary adjustments are made, especially when the issue of value added of the final product afforded by the certification brand is considered. The results of the qualitative interviews reinforce this proposition, as shown later in this article.

As seals and certificates deal mainly with value differentiation, this paper proposes the creation of such dimension, including the WTP and the status conferred by the consumption of this product type. This dimension is based on the work of Aaker (1996) with some new questions incorporated in the dimensions of loyalty, associations, and differentiation measurements (especially those related to the consumption experience).

Brand equity

The models of Aaker (1996) and Yoo et al. (2001) were used as the main base for questionnaire construction. According to D'Emidio, Zwicker, Rocha, and D'emidio (2010), Aaker's (1998) model is the most cited for understanding brand value. The uniqueness of this model is that it proposes the use of both active and passive aspects in brand valuation, generating the intrinsic possibility of a negative evaluation of brand value. The model defines five basic dimensions for assessing brand value: loyalty, brand awareness, perceived quality, associations, and other assets of the brand.

The originality of the Yoo et al. (2001) model lies in the use of marketing mix elements in the evaluation of brand equity. According to them, despite considerable research efforts made regarding the subject, few works have focused on assessing which elements of marketing activities effectively build brand equity. Unlike the model proposed by Keller (1993), which comprised only awareness and brand image, the authors consider more "tangible" factors involved in the product marketing mix, such as price, image at point of sale, distribution intensity, advertising spending, and price agreements in retail.

This paper, after model purification procedures, has used the perceived quality dimension based on Aaker (1996) and

two additional dimensions – brand loyalty, brand associations and brand awareness, which are based on the work of Yoo et al. (2001). The composition of the brand equity evaluation adapted to the case of agricultural commodities is presented in Figure 2. It describes how this construct (part of the Theoretical Model presented in Figure 1) was built. Seven indicators, grouped in three formative dimensions, were used to measure Brand Equity.

METHODOLOGY

To aid in the validation of the questionnaire, 10 semi-structured interviews were conducted with high-income consumers of pork. Initially, all respondents said they were at least occasional consumers of pork and were responsible for the purchase of pork products for their homes. Consumers who responded affirmatively to both these questions were asked to make free associations with pork and were encouraged to talk about the features and attributes they considered in buying it.

Sampling technique was used in online surveys. After the publication of the questionnaire, an invitation was sent to people on the contact list of the authors and their advisors (who themselves can be considered high-income consumers), requesting their responses. They were asked to share the link within their own circle (also expected to be high-income consumers). Potential respondents were asked to complete the questionnaire only if they had eaten pork in the last month.

The final questionnaire included 52 questions divided into six sections, namely: Part 1 – Product Origin (Brazilian or imported); Section 2 – Perceptions of and Attitudes to Food Production Processes; Section 3 – Perceptions of Food Safety; Section 4 – Brand Equity of Certification Processes; Section 5 – Perceived Brand Value; Section 6 – Identification of Consumers. All information obtained from the qualitative phase of the research was used in the final draft of the questionnaire.

An initial pretest questionnaire was applied with six trial respondents. After some minor corrections suggested by the pretest respondents, the questionnaire was released for access by those who received an invitation link. An e-mail was sent to the people included on the contact lists, requesting their response. After two weeks, a new invitation was sent reinforcing the request. A good response rate was observed (from approximately 300 contacts initially approached, 132 valid questionnaires were collected). A very common behavior was the display of messages from these contacts passing the request to other contacts in their personal lists on their own initiative.

Figure 2. **Dimensions used in the evaluation of brand equity**
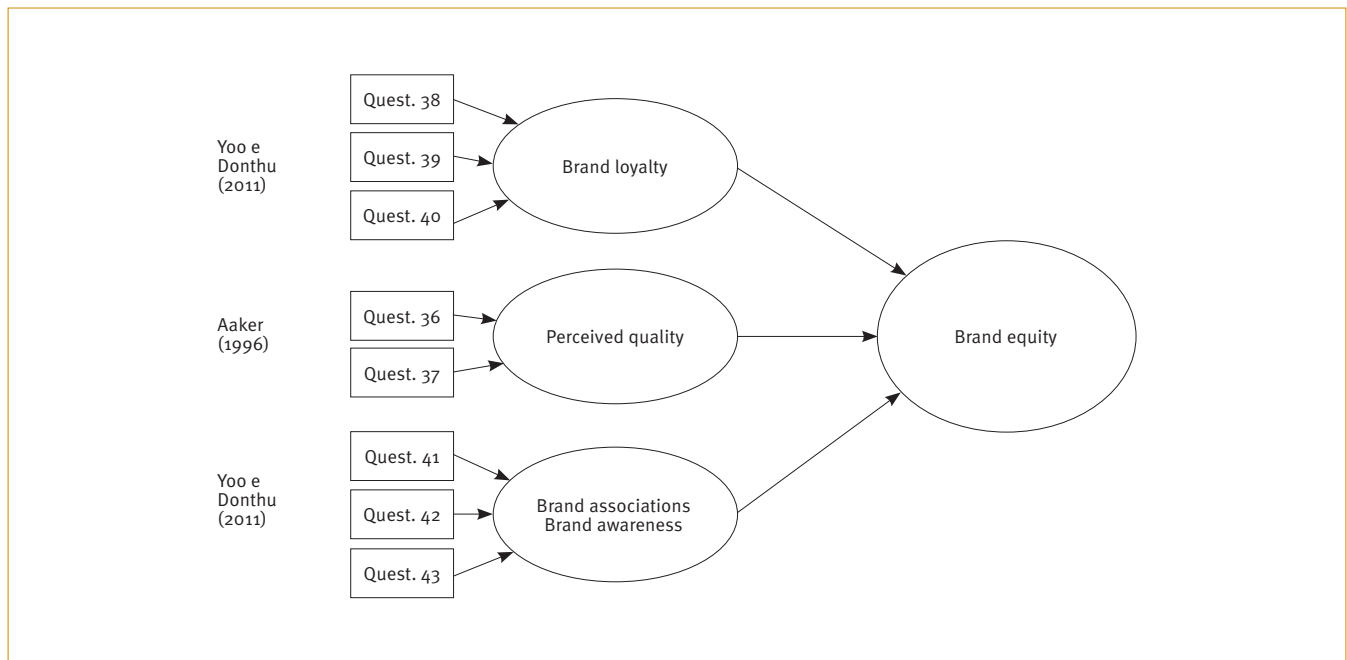
To ensure that all research objectives were covered, the plan for data analysis consisted of five stages, following the analytic framework suggested by Carvalho (2000): error analysis and extreme values (outliers), factorial analysis of the scales, checking of the reliability of the scales, and analysis using the techniques of structural equation modeling (SEM). These verified the assumptions and the proposed theoretical model could be confirmed by empirical data. Results were tabulated in Excel files and an initial analysis was undertaken. For the frequency distribution of the indicators, correlations between indicators, exploratory factorial analysis, and cross tabulations, we used SPSS version 22.0 software. For confirmatory analysis using SEM, AMOS 18.0 software was used.

The exploratory factorial analysis (EFA) was chosen as the first step in data analysis following the example of Gerbing and Hamilton (1996), who said that it is always preferred to begin an analysis as far along the confirmatory end of the continuum as possible. The authors argued that the methods provided by confirmatory factor analysis (CFA) for data-driven model specification are more appropriate for "fine tuning" the model than for large-scale specification of models that are wrongly specified. Since some adjustments had been made in the model, it was found necessary to "start over" the indicator grouping analysis from an exploratory technique.

Marsh, Morin, Parker, and Kaur (2014) pointed out that while EFA is an important precursor of CFA/SEM, it has been widely seen (wrongly) as less useful, partly on the basis of the semantically based misconception that it is purely an "exploratory" method and should be used only when the researcher has no prior assumptions regarding factor structure. But the authors argue that in EFA, the factors are extracted from the data without specifying the number and pattern of loadings between the observed variables and the latent factor variables. In contrast, confirmatory factor analysis specifies the number, meaning, associations, and pattern of free parameters in the factor loading matrix before a researcher analyzes the data. Since, we adapt a considerable part of the scales and develop others from a collection of authors, a "step back" with EFA was considered useful.

RESULTS AND DISCUSSION

A total of 212 questionnaires were collected. After an initial screening to discard incomplete responses, 132 responses were considered valid. The average age of respondents was 40.68 years, and consisted of 60.55% men and 39.45% women. The average monthly family income of the respondents was around U$ 6000. This, according to Brazilian government data, corresponds to a high-income profile. Regarding the frequency of pork consumption, 37.61% of respondents were classified as sporadic consumers, 39.45% said they bought the product "fairly regularly," and 22.94% were frequent users.

After an initial analysis, the model was found to present unsatisfactory fit indices. A separate analysis of each of the constructs was then conducted, together with an analysis of the convergent validity of the model, performed by measuring the composite confidence (CC) and analysis of variance extracted (AVE) of each construct, following the recommendations of Prado (2006). The standards set as ideal are CC› 0.7 and AVE› 0.5 (Hair et al. 2009). Using data from the output of the AMOS software, the values for CC and AVE for each construct were calculated.

To obtain constructs with greater explanatory power, a decision was made to eliminate indicators with lesser explanatory power for total observed variance. This procedure was repeated for each construct until acceptable CC and AVE values were achieved.

Four indicators (questions) were removed from the construct "Origin of Product." Although, the AVE value did not reach the minimum of 0.5 (the result was 0.4), the construct was accepted based on the argument by Mulaik et al. (1989) that it is necessary to consider both the theoretical reasonableness of the construct and the potential to add knowledge to the field of study in the evaluation of the convergent validity. Regarding "Perceptions of and Attitudes toward Food Production Processes," four indicators were excluded – questions 13, 15, 18, and 20. For the construct "Brand Equity of Certification Processes," questions 24, 30, 33, and 34 were removed. Finally, questions 42, 44, and 45 were removed from "Brand Equity."

Once the purification procedures had been completed and the convergent validity of the model could be established, the covariance between the constructs was reviewed to determine the discriminant validity of the model. This determines whether the constructs relate to each other in a satisfactory manner (Churchill & Yacobucci, 2005). Based on the results obtained using AMOS for correlations between the constructs, we undertook AVE analysis. Fornell and Larcker (1981) have showed that it is possible to affirm there is discriminant validity of the model if the AVE value for each construct is less than the correlation value of that construct with other constructs squared. This requirement was met for all remaining constructs in the validated theoretical model. AVE values and the square values of correlations between constructs are presented in Table 1.

Table 1. Calculations of discriminant validity for constructs in the purified model

	Origin of Product	Perceptions and Attitudes on Food Production Processes	Brand Equity of Certification Processes	Brand Equity
Origin of Product	0.40			
Perceptions and Attitudes on Food Production Processes	0.06	**0.51**		
Brand Equity of Certification Processes	0.00	0.00	**0.51**	
Brand Equity	0.00	0.20	0.00	0.51

Notes: Numbers in bold are the AVE. All other data represents the square values of the correlations between the constructs.

As the constructs resulting from the purification of the model met the conditions set by Fornell and Larcker (1981), it was possible to state that the model has discriminant validity. A check of the internal reliability of constructs was conducted using Cronbach's α. According to Hair et al. (2009), values above 0.6 and 0.7 are acceptable. All scales used reached the level required for validation.

It is interesting to notice that elimination of such indicators signified no relevant theoretical background change. Constructs were the same - it was only a question of using the indicators with greater explanatory power. Since the whole construction of the model was based upon adaptations of pre-existent scales that were developed for use under different circumstances, some degree of fine adjustment was to be expected.

Boomsma (2000) states that after several modifications it is the researcher's responsibility to answer questions about the validity of that model. Serious attempts should be made to realize some form of cross-validation with respect to the set of models considered in a sequence of model evaluations. The author suggests testing the validity of the proposed modified models, ideally using an independent, fresh sample from the same population. Thus, a second round of data collection was conducted, using the final questionnaire after model purification and the same data collection strategy.

In the second round of data collection, a total of 116 questionnaires were considered valid. The average age of respondents was 35.58 years and consisted of 39.81% men and 60.19% women. The average monthly family income of the

respondents was around U$ 4500 (this corresponds to a high-income profile). Regarding the frequency of pork consumption, 26.85% of respondents were classified as sporadic consumers, 47.22% said they bought the product "fairly regularly," and 25.93% were frequent users. Except for the gender proportion, all traits of this second sample were consistent with the population of the first round of data collection.

This gender difference could be important and responsible for part of the differences found in the analysis of these two samples. Women's diets are healthier than men's. According Prättälä et al. (2006) Finnish women eat more fruits and vegetables but less meat than men. For Gossard and York (2003), gender has a particularly strong influence on meat consumption. However, the authors could not provide physiological reasons to explain why men would require more meat than women. They found that women consume substantially less meat than men (74 grams a day less), and also consume less beef (almost 17 grams a day less).

To test the hypotheses and their level of significance, we used the t-test, the results of which are shown in Table 2. For acceptance of the hypotheses, the critical ratio (CR) must be greater than 1.96% for a significance level of 0.05 and above 2.58% for a significance level of 0.01% (Hair et al. 2009). Both data collection rounds were tested separately and the final result on support for each hypothesis were presented.

Table 2. Results of t-tests for hypothesis testing in the purified theoretical model in both 1st and 2nd rounds of data collection.

Hypothesis	Relationships between the constructs			Round of data	λ^a	CR^b	Sig. $(p)^c$	Results
H1a	Origin of Product	$\dashrightarrow$	Brand Equity	1st	0.473	3.935	0.000	Supported
				2nd	0.129	1.197	0.231	Not supported
H1b	Origin of Product	$\dashrightarrow$	Perceptions and Attitudes on Food Production Processes	1st	0.189	1.139	0.255	Not supported
				2nd	0.155	0.840	0.401	Not supported
H1c	Origin of Product	$\dashrightarrow$	Brand Equity of Certification Processes	1st	0.334	2.430	0.015	Supported
				2nd	0.519	4.717	0.000	Supported
H2a	Perceptions and Attitudes on Food Production Processes	$\dashrightarrow$	Brand Equity	1st	-0.181	-2.626	0.009	Supported
				2nd	0.067	1.370	0.171	Not supported
H2b	Perceptions and Attitudes on Food Production Processes	$\dashrightarrow$	Brand Equity of Certification Processes	1st	0.218	2.625	0.009	Supported
				2nd	0.044	0.827	0.408	Not supported
H3	Brand Equity of Certification Processes	$\dashrightarrow$	Brand Equity	1st	0.269	2.745	0.006	Supported
				2nd	0.393	3.074	0.002	Supported

Notes: (a) standardized path coefficient; (b) Critical Ratio; (c) level of significance.

For the construction of the final model, only the relationships between variables that were supported on both data collection rounds were considered valid. According to Boomsma (2000) who, quoting Steiger (1990), highlighted the relative importance of replication and cross-validation most forcefully: "An ounce of replication is worth a ton of inferential statistics" (p. 176).

Furthermore, the hypothesis confirmed in both samples gain an extra reliability, once they were tested and confirmed with populations that show important demographic and behavioral differences, but both consistently show a high-income profile. If they prevail on these different circumstances, it could be assumed that the correlations between the constructs involved in this confirmed hypothesis really exists.

The final model after purification procedures, validation, and considering the assumptions stated above, is shown in Figure 3.

Figure 3. Theoretical model after purification and validation processes, considering first and second rounds of data collection
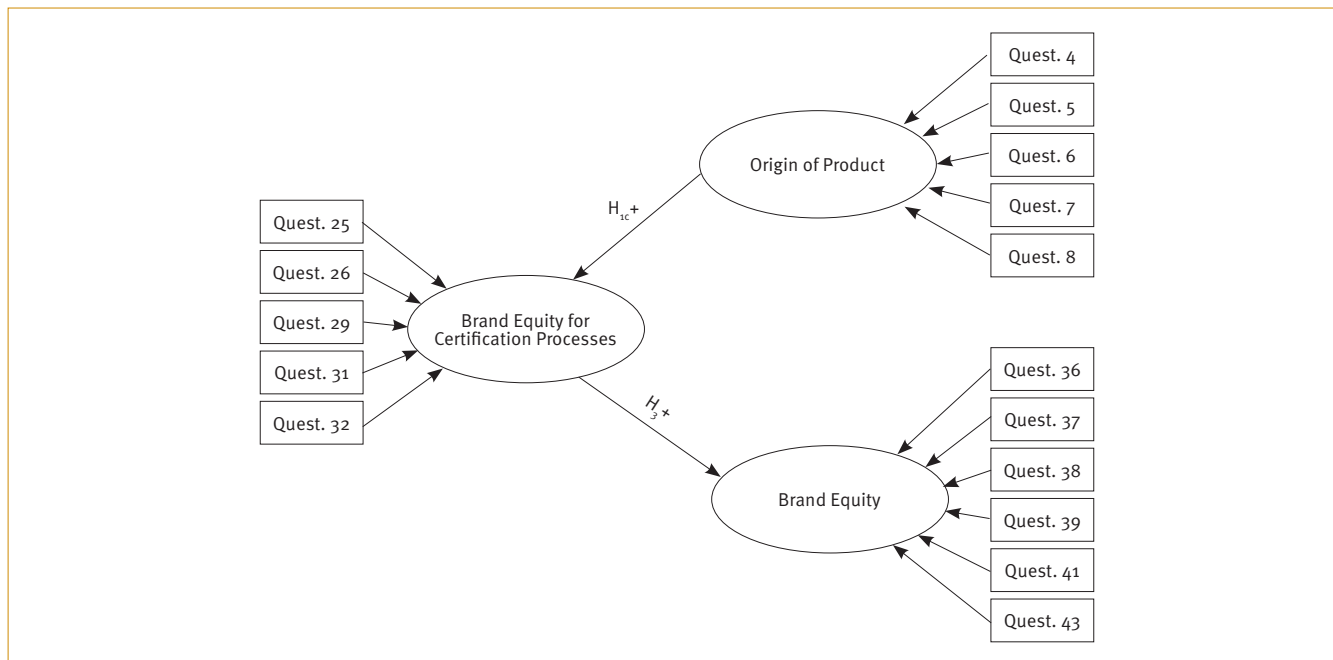
Regarding hypotheses concerning the construct "Origin of Product," the only hypothesis supported is H$_{1c}$, showing a positive correlation with brand equity for certification processes. Thus, better the image consumers have of products produced in Brazil, greater the value they will give to a brand for a certification process.

Origin is closely related to trust. Jiménez e San Martín (2014) studied the action of trust as mediator of COO and found that in an emerging market economy (such as Brazil), the COO's brand reputation influences trust and purchase intention more than in a mature market. Also, the results show that trust plays an important role in different markets because it mediates the effect of COO's brand reputation on consumers' purchase intention in both emerging and mature economies. Therefore, it is reasonable to assume that greater the confidence consumers have on the product and its origin (and in the whole production chain by association), the more they will believe in certifications granted under the same scenario.

Several studies affirm that the degree of consumers' awareness of certifications is below desired levels (Boccaletti & Nardella, 2000; Botonaki, Polymeros, Tsakiridou, & Mattas, 2006), and it is reasonable to assume that when consumers positively evaluate the origin of a product, they will tend to compensate their lack of knowledge about certifications with this origin cue. This paper's results corroborate those of Kim (2008), who studied how Japanese consumers of pork evaluated the trade-offs between price and intrinsic and extrinsic "tips" of product quality and found an evident effect of the origin of products in the choices of the respondents. They stated that there is a positive effect of Origin of Product on perceived brand equity. It is reasonable to assume that this favorable brand equity perception could be transferred to a certification brand.

Giraldi and Lopes (2010) found that the beliefs about communication and distribution of Brazilian fruits affects the image Dutch consumers have of Brazil and that better the country image, better is consumer's attitudes toward this kind of product. If certification seals could be understood as a way to communicate special traits and attributes of products, the H1c hypothesis would be in consonance with the findings of Giraldi and Lopes (2010).

The H1c relationship is also reinforced by results of Lilavanichakul and Boecker (2013) who showed that consumers accept better products with important technological improvements (internal tags to trace animal products) when they have regional (and better known) brands. Authors postulate that this indicates that concerns about safety surpass consumers' natural fear of new technologies and a "closer" brand tends to minimize such fears.

H3 hypothesis was supported, indicating that greater the value consumers attribute to seals and certifications, more they value brand equity in the final product. As stated before, studies indicate that the level of consumer awareness of certifications is below desired levels. Nevertheless, this study confirms a

positive relationship between the value that consumers attribute to certification processes and brand equity in the final product.

This confirms the findings of Weinrich et al. (2014) who pointed out that in Germany, milk and milk products are increasingly advertised with additional features for product differentiation, aiming at value creation in consumers' minds. German consumers are paying extra prices for milk from cows raised on pastures – a procedure that was the norm a few decades ago, but that has been replaced by fully housed systems. More than 50% of respondents consider fully housed systems problematic and are willing to pay more for milk produced by respecting animal welfare.

We postulate that the high-income profile of the population also played a role in reinforcing the value attributed by consumers to certifications and seals. Such findings are in consonance with results from Shukla, Banerjee, and Adidam (2013) who found that high-income and highly educated shoppers perceive themselves to be smart, as opposed to low-income shoppers with lower education. They tend to believe that they make better judgements when they are well informed about products, especially when helped by seals and certifications.

Zakowska-Biemans (2011) segmented Polish consumers by their socio-demographic variables and intention to buy organic food. The group named "Conscious," which have a higher level of income and better education, proved to be a bigger consumer of organic products. The author states that in the case of organic food, consumers could verify its authenticity by information included on the label. This confirms that the valorization of seals and certificates implies a higher value (higher brand equity) attributed to the final product. An interesting point highlighted by Zakowska-Biemans (2011) is that price is another factor hindering consumption of organic food in Poland, since prices often exceed the acceptable difference between organic and conventional food. Given that Poland is also an emerging market as Brazil, it will be interesting to address this question of price in further studies.

Another study that is aligned with the findings presented here is the one by Larceneux, Benoit-Moreau, and Renaudin (2012). They studied the effect of a certification label as moderator for brand equity of host product. The authors proposed that a third-party label (a certification brand) constitutes a specific type of brand, acting as cobranding. They define "label equity" as awareness and a set of associations or beliefs that provide a strong, sustainable, differentiated advantage, compared with that achieved by unlabeled products. In this perspective, when a brand adds an organic label to its product packaging, the result is enhancement of the brand equity for the host product.

The dimensions proposed here for the evaluation and measurement of brand equity attributed by consumers to certification processes are promising. The use of perceived quality (based on Aaker, 1996) and total value of brand (based on Yoo et al. 2001) are adaptations of scales already proposed for other purposes, but the set of measurements used here also includes a novelty – the status related to consumption of differentiated products. That is a contribution to the measurement of brand equity for seals and certificates. The status evaluation is based on the work of Wu, Xu, and Gao (2011), which examined the willingness of Chinese consumers to consume certified products (after a crisis of milk contaminated by dyes) and the status conferred by this attitude.

This combination of measurements has proved quite suitable for this study. The results of the exploratory factor analysis and the confirmation of the hypotheses concerning these constructs through SEM, in both first and second data collection rounds, indicate that this relation exists. The model is promising and should be refined and improved by future studies.

Hypotheses H1a (Origin of Product Influencing Brand Equity), H2a (Perception and Attitudes on Food Production Processes influencing Brand Equity), and H2b (Perception and Attitudes on Food Production Processes influencing Brand Equity of Certification Processes) were supported in the first round of data collection, but not in the second. Nevertheless, they should be included in future studies, especially those related to "Perception and Attitudes on Food Production Processes" construct. All indicators used in this construct were first proposed here. These clearly demand further refinement, validation, and confirmation. But the partial support obtained in the first round of data collection points to the worthiness of future studies, along with literature support presented in the section on operationalization of constructs.

Hypothesis H1b was not supported in both data collection rounds. Therefore, based on the principles presented above to validate the hypotheses that were corroborated in both rounds of data collection, it may be advisable to exclude the postulation of an effect of "Origin of Product on Perception and Attitudes on Food Production Processes" in further studies. A simpler model could have greater explanatory power and a relation that has been proven as not valid in two distinct populations, could be excluded in the future.

The choice of pork as an object of study is justified. The pork supply chain is very developed in Brazilian and international agribusiness, having high levels of professionalism and productivity. Brazil now ranks fourth in the world as producer and exporter of pork. The industry is a source of numerous

direct and indirect jobs in the country. This study represents an attempt to generate subsidies for companies willing to adopt branding strategies that could attach higher perceived value to their products. This particular product was chosen, given the characteristics of its production chain (highly organized and vertically coordinated), believing that the conclusions reached here could be easily extrapolated to other commodities.

CONCLUSIONS

The final model obtained after two rounds of data collection is much simpler than the original one proposed in the Figure 1, but the hypotheses confirmed in both rounds have solid data and theoretical background supporting them. Both replication of results obtained in the two sets of data and literature support, as exposed in the results and discussion section of this paper, assure the validity of these findings.

Two hypotheses were supported after all validation and refinement procedures: $H1c$, which states that Origin of Product positively influences brand equity of certifications processes; and H_3, which relates brand equity of certification processes with brand equity in the final product.

Looking at Figure 3, which represents the final purified and validated model, one can find a decision chain for the consumer. For an average consumer, Figure 3 represents a fairly good step-by-step decision guide. "Do I believe that this country produces trustworthy pork products?" If he believes, he will be willing to also believe that this country can deliver acceptable standards of certification regarding the production processes. And, finally, if he positively evaluates both origin and certificates, he would also surely assign a higher brand equity on final products produced under such a scenario.

These practical considerations are in consonance with the data and literature presented above. It seems reasonable to believe that consumers may actually have this decision process in mind when they are faced with decision-making about branded pork products. Whether they do so is something to be addressed in future studies. Data collected in this research seems to enforce that this assumption is true.

From a managerial point of view, through the characterization and measurement of the factors involved in the formation of brand equity of the final product in agribusiness commodities, this study hopes to contribute to the development of branding strategies, potentially enabling managers to develop products with higher perceived value for consumers, and thus providing greater competitive advantage for their organizations. Brazil's major export products are agricultural commodities and there are few studies evaluating brand equity for these.

Based on the results presented here, managers are advised to care closely about COO image. Managers should develop a third-party label, especially if there is a favorable association with Brazil for the product. The results also suggest that if you have a certification brand assuring a higher quality standard, it is expected that consumers will assign a higher brand equity.

The limitations of this study include small data samples. After the first round of data collection, purification, and validation procedures, a larger sample should have been collected. This was not possible due to time restrictions and lack of resources. It is also recommended to repeat this study with broader samples and to assess people with lower income. Apart from better representing Brazilian society, a comparison between high and low-income segments would be important for theoretical construction.

For future studies, it is suggested to better understand how the construct "Perception and Attitudes on Food Production Processes" could be operationalized. This research is only the first step towards development of a reliable instrument to assess this important construct.

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