



Conceptual model to identify factors with influence in Brazilian beef consumption

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ABSTRACT - The complexity of the consumers' behavior has taken the food industry to a new level of dynamism. Therefore, understanding the factors that influence this behavior is decisive for the differentiation of products to niche markets and even to adjust the supply according to consumers' expectancy. This article proposes a conceptual model to identify the factors influencing beef consumption in Brazil. The methodological approach was characterized by a systematic review through a synthesis of research related directly to this topic. Therefore, 76 papers published during the 2000-2014 period, including official documents (statistics), full research papers, abstracts, proceedings, and reports, were selected. Four main factors were related to influences in consumer behavior and/or directly in beef consumption: sociocultural, economic, health/food, and environmental. Among these dimensions, there was an emphasis on recent publications related to health/food and the environment. The compilation and analysis of these papers enabled the conception of the proposed model and suggests the consideration of four main dimensions in beef consumption.

Key Words: agribusiness, beef cattle, behavior, price, sustainability

Introduction

The choice to purchase a food is a complex behavior (Shepherd et al., 1991) influenced by different factors that play an important role in consumer's expectations and perceptions (Chiou et al., 2009). Some consumers become more cautious when searching for safety, high quality (Abreu et al., 2012), authenticity, health, and tradition in their food (Ilbery and Kneafsey, 2000). Therefore, in an attempt to meet this demand there is a need for in-depth knowledge of the consumer behavior (Kopetz et al., 2012).

The increased demand for food is a global trend for the next decades, highlighting the existing difficulty in food supply for the global population (FAO, 2010). Therefore, the food industry has assumed a unique situation, driven by unprecedented changes in economic, technological, and social structures. Given these changes, a new consumption pattern in the population should be acknowledged in order to point out the factors that influence this behavior.

In Brazil, social and economic changes have also influenced the consumer behavior. The increase in the population income, particularly that of classes C and D (IBGE, 2012), has changed the food purchasing habits, allowing for the inclusion of food preferences, which, for financial reasons, once could not be considered priorities, such as beef (Pindyck and Rubinfeld, 2004).

Beef is one of the most important items of the Brazilian diet, and the domestic market is responsible for the consumption of more than 70% of the national production (IBGE, 2012). Despite its importance, research aimed at understanding the particularities and determining the population's consumption pattern is still incipient.

Conceptual models are commonly applied to represent the peculiarities of each context and to assist the understanding of existing concepts in different areas. Some studies indicate this research approach in several areas: automobiles and cellulose (Fuchs et al., 2009), quantum mechanics (Greca et al., 2001), information technology science (Inazawa and Baptista, 2012), and food (Pinho et al., 2012). However, each template encompasses characteristics inherent to each activity, adapted by region and by type of product. One of the conceptual models proposed for food (Pinho et al., 2012) focused only on the socioeconomic and demographic factors of the population.

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However, the conceptual models proposed for food disregard the beef producing particularities and the effect of these properties on the food choices. With respect to this consumer behavior, in addition to the economic and socio-cultural factors, other important issues emerge such as sustainability, environmental impact, scarcity of water resources (Bowman et al., 2012; Ridoutt et al., 2012; Ruviaro et al., 2012), intensification of the production systems, animal welfare (Chandler et al., 2011) and obesity (FAO, 2010), as well as changes in the lifestyle of Brazilians (IBGE, 2012).

Therefore, this article proposes a conceptual model adapted to the Brazilian reality able to identify the factors that influence beef consumption aiming to develop a deeper understanding of this issue.

Material and Methods

The methodological procedure adopted consisted of a systematic review through a research synthesis related to trends and influential factors in beef consumption. This review was based on articles available in the Scielo and Web of Science databases. In addition, we analyzed documents and statistical reports published in governmental and non-governmental organizations.

The documents met the criterion of simultaneous combination of keywords used for searching “food”, “consumption”, “beef”, “trends”, “influence factors”, “behavior”, and “consumer” in Portuguese, English, and Spanish. After a systematic reading of these documents, 76 documents that met the search criteria, published between the years 2000-2014, were selected to cover the most recent discussions related to the topic. Through a questionnaire, 32 experts ranked the selected variables that affect consumption. Thus, the data were organized and synthesized in a framework that highlights the influential factors for beef consumption, their reference, and the corresponding dimension.

After the first phase, the proposed conceptual model with the influential factors identified in the systematic review was again subjected to the opinion of the same group of experts from Brazil’s beef chain supply. These experts belonged to the segments of production (6), industry (2), retail (2), institutional bodies (10), and education/research institutions (12). The specialists were selected in accordance with the inclusion criteria predefined for leveling the sample into the subjected and included *working in the beef production chain with at least five years’ experience and high education (university degree)*. The sample of experts

demonstrated, on average, 45 years of age (minimum and maximum of 28 and 70 years, respectively). The revision of the model by specialists took place on the Internet from April to June, 2014.

Results

The systematic review highlighted four main dimensions that influence beef consumption, composed of the following factors: sociocultural, economic, health/food, and environmental (Table 1). Thus, we propose a model to adapt to the Brazilian context with the main dimensions and influential factors on beef consumption (Figure 1).

Discussion

The results indicate that several factors can influence the consumers’ behavior and characteristics of food consumption, as stated by Kotler (2006). Among these factors, some particular issues stand out, such as the legislation and environmental impact. The studies devoted to this topic struggled to include all factors of influence in consumption, since these components can vary according to the product, quantity, or site of purchase (Kotler, 2006).

Although the factors related to sociocultural and economic dimensions are commonly cited in the classic (Kotler, 2006) and recent publications (IBGE, 2012; Mitchell et al., 2012; Olsen et al., 2012; Rezende and

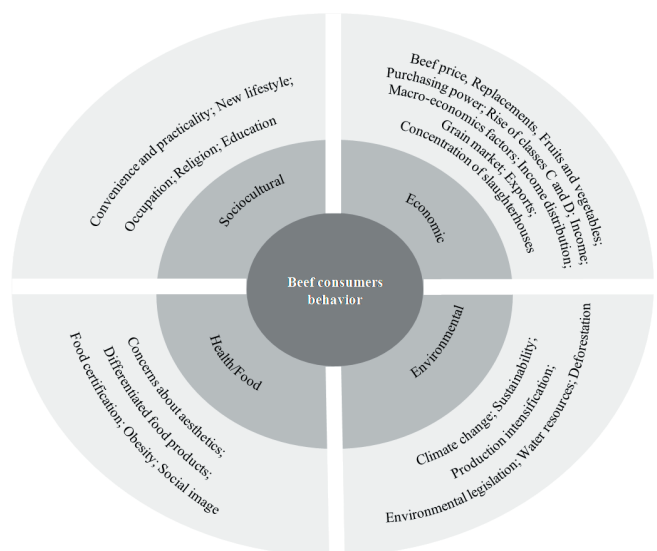


Figure 1 - Main dimensions and their influence factors in beef consumption in Brazil.

Table 1 - Main drivers for beef consumption in Brazil organized by dimension of influence: sociocultural, economic, health/food, and environmental

Influential factors in beef consumption	References	Dimension
Convenience, use of time and practicality	Rezende and Avelar (2012); Mitchell et al. (2012); Olsen et al. (2012).	Sociocultural
New lifestyle (urbanization; women and young people in the labor market)	FAO (2010); IBGE (2012).	
Demographic characteristics (increased lifespan, reduced number of children per family, occupation, religion, education, culture)	Godfray et al. (2010); Kotler (2006), Medeiros and Cruz (2006); Soler and Plaza (2012); Taylor et al. (2012); Realini et al. (2013); Insch and Jackson (2014).	
Food prices (beef; replacements)	IBGE (2012); FAO (2010); Kotler (2006).	Economic
Revenues	World Bank (2012); OECD (2012); Tellez-Delgado et al. (2012).	
Unfavorable macro-economic factors	United Nations (2012); IMF (2012).	
Brazilian beef exportations (concentration of slaughterhouses)	IBGE (2012); FAO (2010).	
Concern with health (food poisoning outbreaks, food safe, carcinogenic foods, obesity, concern with aesthetics)	Aprile et al. (2012); Barcellos et al. (2012); Brandão et al. (2012); European Commission (2012); Worldwatch Institute (2012); WHO (2012); Worsley et al. (2011).	Health/ Food
Differentiated food (functional foods, portioning, frozen, organic)	Chander et al. (2011); Moser and Raffaelli (2012); Bonannoxs (2012)	
Food certification	Aprile et al. (2012); Brandão et al. (2012); Velho et al. (2009); Barcellos et al. (2012).	
Climate change; sustainability (product life cycle analysis); water resources	Moser and Raffaelli (2012); Ruviano et al. (2012); Notarniloca et al. (2012); Stilmant et al. (2010); Behera et al. (2012); Vanhonacker et al. (2013); Grimshaw et al. (2014).	Environment
Intensification of production in Brazil; deforestation	Bryant et al. (2011); Stilmant et al. (2010); White et al. (2010).	Environment
Environmental legislation	Hildebrandt and Islam (2012); Voordouw et al. (2012); Pocard-Chapuis et al. (2010).	

Avelar, 2012; Tellez-Delgado et al., 2012), their results highlight the environment and health/food dimensions related to beef consumption, which was not found in this study.

The growing concern regarding the risks inherent to food, usually related to the misuse of chemicals in agriculture, promoted the search for alternative production methods (Aprile et al., 2012). It is noted that beef consumers are concerned and willing to pay more for safer products such as those traced (Barcellos et al., 2012), certified (Elder et al., 2009), or with origin identification (Insch and Jackson, 2014; Realini et al., 2013).

Environmental issues also stand out in consumers' desires (Grimshaw et al., 2014; Vanhonacker et al., 2013). Recently, Brazil has been ranked among the first positions (in 17 countries analyzed) about the environmentally friendly behavior among consumers (Barcellos et al., 2011). In general, this awareness demands more than quality attributes (e.g., low price, sanitary-hygienic quality, flavor, etc.), like products without chemical residues, with true concerns regarding animal welfare (Chandler et al., 2011), and with no harm for the environment.

A significant part of beef consumers have access to the results of surveys, research studies, and methods capable of measuring, for example, the environmental impact through the emission of greenhouse gases and deforestation caused by the food production (Bowman et al., 2012; Ruviano et al., 2012), or even the use of water in the production systems (Ridoutt et al., 2012). That information shapes consumers' awareness and may affect their consumption decisions, particularly for products purchased frequently.

Of the total publications analyzed, most papers are recent, especially within the health/food and environmental dimensions (Table 1). Particularly for beef consumption, a range of factors associated with food safety and environmental impact have driven publications, indicating possible influences in the consumption of this product.

The proposed conceptual model is a diagram indicating the factors that can influence beef consumption. Such model, adapted to Brazilian beef consumption, presents its dimensions of influence with a varied range of elements classified into the following dimensions: sociocultural (six factors), economic (11 factors), health/food (six factors), and environmental (five factors). The possibility

of interaction among dimensions and among the factors of each dimension was considered.

It is obvious that the consumers' behavior is influenced by endogenous (such as preference for differentiated products) and exogenous (such as macro-economic) factors (Kopetz et al., 2012). This model considered both categories within each dimension. In general, it is possible that in a certain period of time one dimension has greater influence over another regarding beef consumption, while in another scenario this relationship is reversed. For instance, in 2013 the economic dimension had greater influence on Brazilian beef consumption, while in Europe, at the same time, the environmental dimension presented greater importance than other dimensions.

Regarding the population, the income levels and the purchase power are decisive in targeting the priority factors in consumption (IBGE, 2012), because there is a direct relationship between the increase in revenues and beef consumption in developing countries, particularly for the low-income population (World Bank, 2012).

Although the previous conceptual models for food consumption disregarded beef in their analyses, this proposal comprehends the main characteristics of Brazilian cattle production and its consumers. Moreover, especial effort has been made in adding the new challenges for the future of food production, such as sustainability and the ethical relationship with natural resources and animal welfare. The authors believe it is vital to consider those principles when researching food consumers.

This model also provides a way to identify factors that can determine beef consumption in Brazil because it identifies the dimensions and the factors that guide the consumption in Brazil. From the application of this model, it is possible to identify, for instance, if the sustainability and environmental issues, considered important by some European consumers of pork (Barcellos et al., 2011), are more influential than the price for beef consumption in Brazil.

It is important to note that the proposed conceptual model, even being verified by experts of the beef production chain, was based on a systematic review of the literature. Moreover, those aspects should be considered in future research, which could be adapted to other countries or even other products, indicated for both quantitative and qualitative empirical studies.

The main difficulty observed in this study is the attempt to reflect statically the consumption-behavior dynamism and the constant changes in consumption patterns. Thus, a periodic update over the influential factors is necessary and recommended.

Conclusions

This conceptual model improves the understanding of the behavior of Brazilians regarding beef consumption because it summarizes the main drivers. The model can assist the structuring of beef consumer surveys and allows for better predictions in these studies because it reflects the Brazilian reality by listing four dimensions (economic, sociocultural, health/food, and environmental) composed of 28 influential factors for the beef consumption. It should be noted that this model could be adapted to other countries or even to other products. The economic dimension is preponderant for the purchase, but with the increase in consumer income, other dimensions such as healthy/food and environmental are valued by the consumer. Nevertheless, depending on the context, it may require some adjustments in the influential factors, being indicated for both quantitative and qualitative empirical studies.

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