

# The acceptance of plant-based meat analogues in Brazil

**MASTER THESIS**

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## 1 Abstract

Plant-based meat analogues are increasingly being improved to be similar to meat and emerging as a healthier consumption alternative for human health and the environment. Therefore, it is important to understand what are the relevant factors in its acceptance in a country like Brazil. Where there is a very strong meat consumption culture. Thus, this study constructed a theoretical model based on psychology intertwined with culture to investigate the consumer acceptance of plant-based meat analogues in Brazil for traditional feijoada versus imported hamburger made of plant or meat.

An online survey of 199 participants was conducted. Where respondents were exposed to eight different situations of choice between products made from meat or plant. These situations were developed using a mixed between-subject design for two categories of product, material, and consumption occasion. Afterward, questions were asked with a 7-point Likert scale to understand the psychological constructs about their attitudes function, and purchase intentions.

The results indicate that plant-based meat analogues may be accepted in Brazil, primarily for basic and easy-to-make foods such as hamburgers. It was also noted that Brazilian consumers maybe pragmatic, preferring products with utilitarian and functional advantages. Finally, the consequences of meat consumption culture are seen in the attachment to meat shown in the relevance of social norms, values, and identity, which are less significant than utilitarian and knowledge attitudes in the acceptance of plant-based meat analogues disguise as traditional feijoada or imported hamburger.

## 2 Preface

This research is part of my Master's programme in Management, Economics and Consumer studies at Wageningen University. It was conducted in the Marketing & Consumer Behavior research group. It was a fantastic experience filled with invaluable lessons and opportunities for professional development. I hope that businesses and future studies will benefit from this analysis of the various complexities in the adoption of plant-based meat analogues in Brazil.

I want to say thanks to several people who helped me during the project of this thesis. I want to express my gratitude to my supervisor, Dr. Ir. ARH (Arnout) Fischer for the time and commitment in advising this research. I will always remember the sharp and always useful comments for the development of my work. I also want to thank my second reader, Dr. Ir. PW (Ellen) van Kleef for pertinent and important comments. Finally, I'd like to express my gratitude to my family, my Brazilian friends, and particularly my Wageningen friends for all of their support and assistance during this Master's degree.

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## 4 Introduction

In Brazilian culinary tradition, meat is considered an essential food (Ribeiro & Corção, 2013). Accordingly, 81% of the local population follows a meat diet (Inteligência, 2018). The industrialization and urbanization of the 20<sup>th</sup> century provided meat to the middle class (Ribeiro & Corção, 2013). At that time, the consumption of animal protein was stimulated as basic food to maintain strength amongst factory workers (MEDRADO, 2013). The Brazilian diet includes meat and a secondary side dish either rice or cassava with black beans (Aguiar, 2019; CASCUDO, 1967). But there are parts of the population that follows a vegetarian, vegan, or flexitarian diet. Meat is considered locally as nutritious food containing health benefits (Bleil, 1998)

In Brazil, livestock production, particularly cattle, is important due to the economic and political impact throughout its history. The introduction of animal farming for meat production first appeared in the 1500s by the arrival of the Portuguese colonizers wanting to provide food for the new colony (Ribeiro & Corção, 2013).

The negative effects of meat consumption are related to health and environmental risks. The problem with Brazil's meat-loving culture is that meat consumption is associated with non-communicable diseases such as cardiovascular problems, cancer, diabetes, and obesity (de Oliveira Aprelini et al., 2019; Diehl, 2011; Malta et al., 2017; Muniz, Schneider, Silva, Matijasevich, & Santos, 2012; Pichel, 2013; Schneider, Duro, & Assunção, 2014; Zandonai, Sonobe, & Sawada, 2012). The non-communicable diseases in Brazil account for 74% of all deaths. The proportional mortality is caused by the following: 28% cardiovascular disease, 18% cancer, and 5% diabetes (World Health Organization, 2018). Furthermore, meat consumption is putting pressure on the environment and biodiversity leading to climate change (Hedenus, Wirsenius, & Johansson, 2014; Machovina, Feeley, & Ripple, 2015). An alternative to mitigate health and environmental problems could be to follow the model of plant-based meat analogues introduction in Europe.

Meanwhile, in Europe, there is more attention towards plant-based meat analogues to reduce meat consumption, two motives are the health and environmental benefits of plant-based meat analogues (De Boer & Aiking, 2011; Fresán & Sabaté, 2019; McIlveen, Abraham, & Armstrong, 1999; Sabate & Soret, 2014). Perhaps the difficulties in introducing these products in Brazil maybe the Brazilians attachment to meat and plant-based meat analogues being a new product, thus unfamiliar to the Brazilian consumer (Bryant; A. L. N. Costa, 2020; de Araujo, Savoia, Junior, & Lourenço, 2020). In particular, is possible to hypothesize that for traditional meat products replacing meat with the plant would be more difficult than for imported meat products which are less integrated into the national culture. For this reason, this study will try to verify what is the reaction of Brazilian consumers to the introduction of plant-based meat analogues in the versions of traditional food products, in this case, the national dish feijoada versus imported food products, in this case, the hamburger imported from the United States culinary. Investigating which of the product versions is easier for acceptance in this specific culture of meat consumption.

Plant-based meat analogues are characterized as food that mimics the characteristics of natural meat, such as taste, texture, and appearance (Kyriakopoulou, Dekkers, & van der Goot, 2019). They are produced using vegetables or legumes such as soya beans, pulses, peas, and other grains. While proteins are extracted to form a structure close to that of animal meat (He, Evans,

Liu, & Shao, 2020). For this purpose, consumers are now able to use plant-based meat analogues instead of meat in various food situations (Elzerman, Hoek, Van Boekel, & Luning, 2011). It is possible to replace meat with vegetables, beans, tofu, etc. but this work focus only on consumption change from meat fiber to plant fiber. Because it is easier to substitute food that has a similar preparation method, use in meals, and is part of established social interaction at the table. This study will focus on analyzing the substitution of meat by plant-based meat analogues in maintaining a similar eating culture and cuisine.

For this purpose, there is a knowledge gap on the effects of heavy eating meat culture in the introduction of plant-based meat analogues especially in the case of traditional versus imported food. Hence, the importance of meat in western diets (Smil, 2013; Sobal, 2005; Verbeke, 2015). Especially in the Brazilian diet might prevent the acceptance of plant-based meat analogues in Brazil.

The acceptance of new foods is complex, involving different aspects of an individual's psychology and context; especially when analogues are highly appreciated by consumers (Hoek et al., 2011; Wansink, Sonka, Goldsmith, Chiriboga, & Eren, 2005). The literature explains that the consumer acceptance of food depends on the sensory characteristics of the product combined with previous experiences (Costell, Tárrega, & Bayarri, 2010). (Verbeke, 2005) mentioned that knowledge, beliefs, and attitudes can play a role in food acceptance. The affective and social attachment of meat consumers is more than only it is nutritional and biological content (Graça, Calheiros, & Oliveira, 2015). Accordingly, it is important to understand the consumers' psychology when shifting from a meat diet to plant-based meat analogues.

The research objective is to discover the acceptance factors of plant-based meat analogues by the Brazilian consumer. Specifically, to understand the relation between acceptance of traditional food products versus imported food products inside the meat culture in a country where meat is considered essential in everyday meals. Therefore, the research question of this study is:

*RQ: What determines the acceptance of plant-based meat analogues in Brazil?*

In an attempt to answer the main research question, three sub-questions have to be answered:

*SQ1: What is the effect of Brazil's meat culture in the approach to plant-based meat analogues?*

*SQ2: What is the role of personal characteristics in the acceptance of plant-based meat analogues?*

*SQ3: What is the evaluation of plant-based meat analogues disguised as traditional feijoada and imported hamburger food products in Brazil?*

The findings of this report are relevant for theory development, for state institutions, and food companies. The theoretical relevance of a model based on a specific culture intertwined with psychology in understanding consumer acceptance of plant-based meat analogues for traditional versus imported food products. Additionally, Institutions would be able to use the results in policy development and for campaigns that promote plant-based meat analogues



production and consumption. Finally, food companies would be able to adjust their marketing plans for plant-based meat analogues following the Brazilian consumer's evaluations.

## 5 Literature Review

### 5.1 *Plant-based meat analogues quality attributes*

The attributes of a product indicate what benefits the consumer can expect. Based on this, it is possible to affirm that people buy products for the benefits they offer and not for the physical product itself. In addition, there are the benefits of the products that are the same for all people. and the benefits for the consumer, which is the psychological value of the product, this value is then subjective for each person. Finally, these attributes and benefits are connected to an individual's self-schema. Here, is located the center of the self where values, goals, motives are located (Walker & Olson, 1991).

The product's sensory characteristics such as appearance, flavor, and texture are positively evaluated by meat consumers (Elzerman et al., 2011). The importance of sensory aspects is noted by (Hoek et al., 2011) saying that the highest sensory quality of meat replacers, the more participants in his research showed interest in using meat substitutes. In this way, it is inferred that it is important that meat substitutes have these characteristics similar to meat to facilitate their acceptance. (Elzerman et al., 2011) proposes that for acceptance of meat substitutes, consumers must recognize meat analogues as a product that can be consumed in place of meat. For this reason, the Brazilian culture of meat consumption has the potential to contribute to its consumption context and preparation methods to try to replace meat with plant-based meat analogues. In this way, making the introduction of plant-based meat analogues more accessible to consumers already culturally accustomed to using meat in their various meals. Also due to the sensorial similarities of plant-based meat analogues with meat, consumers are expected to be more open to experimenting with them.

### 5.2 *Benefits*

When the benefits of a new product are clearly identified by the consumer, this will accelerate its acceptance (Frewer, Scholderer, & Lambert, 2003; Giles, Kuznesof, Clark, Hubbard, & Frewer, 2015). Tradeoffs between the costs and benefits, of a new product, can contribute to the acceptance or rejection by the consumer (Ronteltap, Van Trijp, Renes, & Frewer, 2007). That is why people process cognitively that when an attitude is favorable, it will represent that the object in question has good benefits and little risk (Alhakami & Slovic, 1994).

The benefits of plant-based meat analogues can be classified as individual benefits, such as health. or benefits for society, such as benefits for the environment (Ronteltap et al., 2007). Sometimes, even products with health benefits can be rejected by consumers, if their sensory qualities are not in line with consumer expectations (Frewer et al., 2003). Another possible classification for benefits is hedonic, which brings a pleasurable benefit that comes more from the sensory characteristics. And the second, utilitarian is the functional benefits of a product. Both types of benefits will help in the formation of product evaluations (Batra & Ahtola, 1991). Is possible to conclude that the individual's benefits such as health and society benefits such as benefits for the environment can affect the attitudes towards meat and plant-based meat analogues.

### 5.3 *Product and personal beliefs*

The research by (Hoek et al., 2011), is described two types of beliefs that can act as determinants to accepting analogs to meat: product and person-related beliefs. Their combinations will influence and shape the evaluation of the products, and consequently their acceptance. Product-related beliefs are related to negative beliefs about sensory aspects and product use. They tend to be more important than person-related beliefs, such as concern for the environment or health when buying a meat substitute (Hoek et al., 2011). Finally, gender, age, and education influence acceptance. Being gender the most significant, women are more open to products considered natural or healthy. Older people with less education, on the other hand, show more reticence in following a plant diet (Lea, Crawford, & Worsley, 2006). It is expected that these two types of beliefs will influence the formation of consumer attitudes and the acceptance or not of plant-based meat analogues in Brazil and their possible purchase intention.

### 5.4 *Consumer Acceptance*

There are multiple determinants in the relationship between food and individual. The relation is dependent on the food proprieties like physical appearance, nutritional content, and consumer characteristics such as gender, age, psychological state (Costell et al., 2010). The acceptance of a food product is determined cognitively by previous knowledge, affect for a product, and context. Thus, is expected that consumers would have beliefs and attitudes toward products. Based on past experiences and future expectations about the quality of existing and new products (Villegas, Carbonell, & Costell, 2008). Furthermore, the evaluation of foods by the consumer occurs in an interplay between affect and cognition (Shiv & Fedorikhin, 1999). In the case of this study, Brazilian individuals are expected to have beliefs and attitudes already established about meat. But for plant-based meat analogues, beliefs and attitudes still need to be formed. Hence, all those psychological factors make the acceptance of existing and novel products complex. Several studies have shown that the acceptance of new food by consumers is extremely difficult. Especially, when these new foods are active to replace products that consumers identify with and like very much (A. Costa & Jongen, 2006; Hoek et al., 2011; Stewart-Knox & Mitchell, 2003) as in the case of meat (Fiddes, 2004).

### 5.5 *Culture*

The influences of culture. There is an interplay between culture and individual characteristics in product acceptance (Frewer et al., 2003). According to (Rozin, 1996), culture influences the availability and price of food in a country, because it is the driver of demand. Also, the influence of social norms in a specific culture affects what people eat. The reason is that knowledge, beliefs, attitudes, values, norms are learned through culture (Triandis, 2002). As a result, social and cultural values and belief systems can influence food choices in a country (Germov & Williams, 2008; Marshall, 2005; J.-B. E. Steenkamp, Ter Hofstede, & Wedel, 1999).

### 5.6 *Psychological origins of culture formation*

An interesting explanation of culture in three dimensions is from (D. Briley, Wyer Jr, & Li, 2014). In this study two perspectives are selected: The social collective and cognitive perspective to explain the interplay between culture, attitudes, and the intention/consumer acceptance of meat and plant-based meat analogues in Brazil. In the first, culture is explained as operating at a macro or societal level. What is fundamental are the values and practices shared collectively. With common meanings and behaviors of a society. The second is the cognitive perspective says that culture is in thinking. A set of beliefs and attitudes forms a network of

culture and depending on the context they can be activated or not. In this dynamic, it is also conceptualized that norms and values are stored in memory in an associative way (D. Briley et al., 2014).

In the collective social approach, it is possible to affirm that the study environment in Brazil and its culture of high meat consumption. Inside this context, there are shared collective practices such as the consumption occasion or methods of preparing meat that can be applied to plant-based meat analogues. The second choice of the study is for the cognitive perspective because this approach will be found the beliefs of Brazilian consumers about meat and expected attitudes towards meat and attitude formation in relation to plant-based meat analogues. Always having influences of the social norms and values of the Brazilian society in attitudes formation processes.

### 5.7 *Subjective culture*

In the context of culture, there is a definition called subjective culture, which studies the way individuals perceive their social environment (Barcellos, Lans, & Thompson, 2007; Triandis, 2002; Triandis, Vassiliou, & Nassiakou, 1968). Subjective culture can affect behavior, as it represents the norms and values of a society and can influence attitudes about products (Lee, 2000). Furthermore, (D. A. Briley, Morris, & Simonson, 2000) argues that cultural knowledge will provide rules and principles for people to make decisions.

The concept of subjective culture provides a theoretical basis for understanding how social norms influence what an individual will consume, with whom and in what way within a specific culture such as the Brazilian one. In addition to the existence of rules and principles based on extensive prior knowledge about cuts of meat, their qualities, their uses, and their methods of preparation (Aguiar, 2019; Albrecht, 2010; Barcellos et al., 2007). For plant-based meat analogues, this prior knowledge needs to be applied by Brazilians into these new products. As mentioned in the literature, it is possible that plant-based meat analogues for being new products in the Brazilian context that consumers could exhibit negative beliefs about their sensory quality and use. Also, based on the literature on culture and food, that the consumption occasions and methods of preparation can be similar to those of meat (Elzerman et al., 2011). Because as explained by the theory of national culture, the environment will shape the experiences and learning about food choices (J.-B. E. Steenkamp et al., 1999). This occurs due to the influence of family and groups in the society in which the individual is inserted. Therefore, a strong effect of meat-loving culture is expected on the attitudes and intentions of individuals to purchase meat products and plant-based meat analogues.

### 5.8 *National culture*

The culture of a country is considered the environmental characteristic that intertwines the different behaviors found in a society. This will affect the values, norms, thoughts, and behaviors of the persons (Barcellos et al., 2007; J.-B. E. Steenkamp et al., 1999; J. B. E. Steenkamp, 2001). Accordingly, the national culture will regulate human activity in a country, contributing to the social and economic formation of it (J.-B. E. Steenkamp et al., 1999).

The first experiments with food and the cultural context will shape the eating habits of children (Germov & Williams, 2008). Culture is absorbed by experience and social learning, since an early age with persistent effects until adulthood (D. Briley et al., 2014). Also, attitude towards food is formed in early childhood. Being influenced by family and culture, making it difficult to change. With this, it is considered one of the biggest determinants in attitudes and behaviors

related a food choice (Cervellon & Dubé, 2005). Finally, culture for a society, is like a memory for a person (Triandis, 2002).

Finally, culture also influences the social norms of consumption. Social norms are unwritten codes about what should and should not be consumed and how. Then following the social norms of a particular group will influence the membership or not in groups (Higgs, 2015; Marshall, 2005). With this, it is proven that in addition to the sensory and nutritional content, food is used to bring together people in formal and informal social gatherings (Germov & Williams, 2008).

Based on the work of the Brazilian anthropologist (Da Matta, 1984) was possible to extract two moderators for the theoretical model named consumption occasion eating on the street or eating at home. As based on his work Brazilians divide their life between street and home, each one having a different psychological representation.

### 5.9 *Brazilian Cuisine*

It's important to explain what are the characteristics of Brazilian cuisine in the past and today to acknowledge this cultural traditional culinary. Culture determines what is appropriate or not to be consumed as food, and also contributes to the appropriate methods of preparation and consumption, thereby shaping the acceptance of food (Germov & Williams, 2008; Marshall, 2005). The food in the formation and consolidation of the Brazilian territory was formed by an excess of protein from different animals. And a variety of cereals such as wheat, corn, cassava, rice, black beans, bananas, vegetables, and fruits (Aguiar, 2019).

Finally, the analysis of three important cookbooks on Brazilian cuisine, (Aguiar, 2019) demonstrates that out of more than 300 recipes for sweet and salty food, they involved 30-40% of the dishes using some type of meat. With the factors explained above, it is understandable that meat consumption in Brazil might be linked to tradition and culture. And specifically in beef, consumption habits are related to cultural behaviors and for pleasure and not only about the nutritional content (Giacomazzi, 2016).

After the historical presentation used above to illustrate the types of food consumed in Brazil. It is important to present what is the current diet of Brazilians, based on research by the National Institute of Statistics and the Ministry of Health. The Brazilian diet continues to be considered monotonous with almost ten foods making up almost half of the consumption in Brazil. Rice and beans continue to be the main dish, with some animal protein (beef, pork, chicken) as a complement (Belik, 2020; Brasil, 2014; Instituto Brasileiro de Geografia e Estatística, 2020). The other foods are bread, milk, bananas, soft drinks, beers, and sugar. The consumption of fruits and vegetables remains below that recommended by the WHO. Moreover, there is an increase in the consumption of ultra-processed and ready-to-eat foods. Such as pizzas, lasagna, sausages, fried snacks, ice cream, biscuits (Brasil, 2014; IBGE, 2020).

Therefore to apply this traditional culture to this research, Brazil's national dish feijoada which is a stew of meat leftovers with black beans is selected to operationalize the concept of traditional food. For the operationalization of the concept imported food is selected hamburgers which is an imported food from the United States and consumed widely in Brazil. With these two selections would be possible to compare the traditional feijoada versus imported food hamburger in the meat and plant versions. Next, the theoretical framework is presented.

## 6 Theoretical framework & Hypotheses

To answer the main research question and understand the process of consumer acceptance of plant-based meat analogues in Brazil in the form of traditional feijoada versus imported hamburger food products. This research acknowledges a framework that includes theories on attitudes (Ajzen, 2001; Katz, 1960), consumer acceptance/intention (Ajzen, 1991), culture (D. Briley et al., 2014; Da Matta, 1984; J.-B. E. Steenkamp et al., 1999; Triandis, 2002). Figure 1 provides an overview of the framework explained in this chapter.

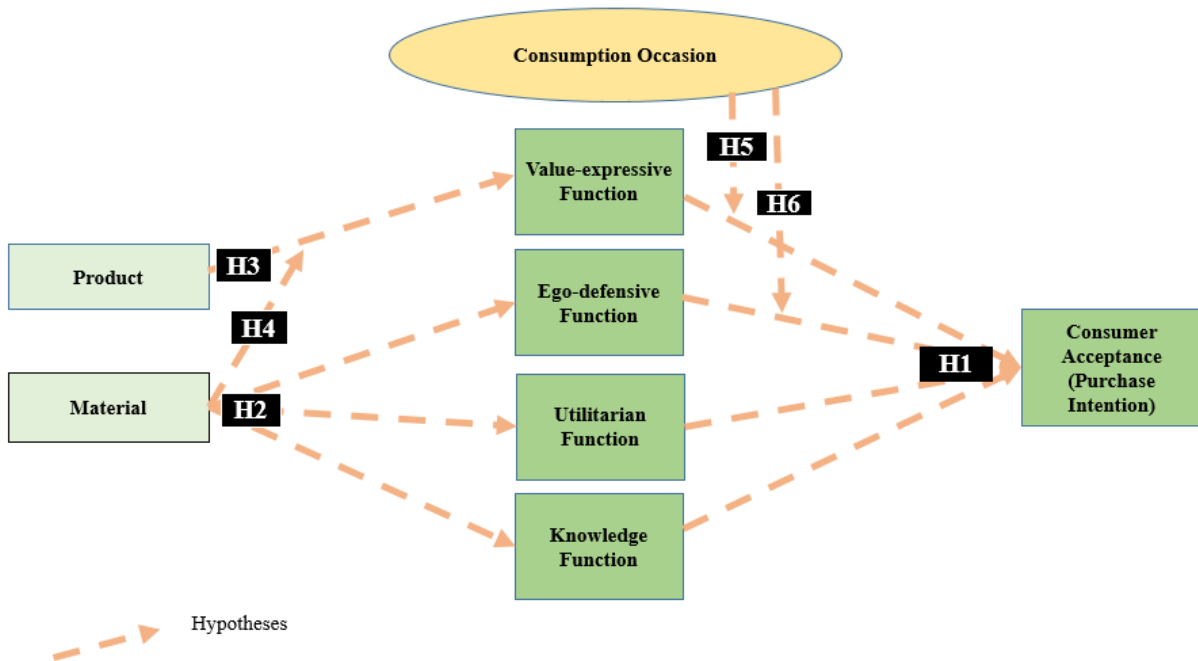


Figure 1. Theoretical framework. In rosy color predicted hypotheses.

### 6.1 Mediator: Four functions of attitudes

The central point of the theoretical model developed in this study is the theories about attitudes. Accordingly, it is important to explain the concept and its relationship with the independent variables, culture (consumption occasion), and intention, which are the other variables in the theoretical model of this research. The author selected the school of functional theories, thus these two theories are explained below: Functional Theory (Katz, 1960) and Theory of Reasoned Action (Ajzen, 2001).

### 6.2 The Functional Approach to the Study of Attitudes

Two mental processing systems are operating simultaneously in the persons mind. System 1 operations are fast, automatic, and unconscious. They are associative and emotional. System 2, on the other hand, operations are slow, conscious, effortful, deliberated, and rule-based (Kahneman, 2003). Here is possible to consider that attitudes are determined by affect and cognition (Ajzen, 2001).

A parallel can be drawn with another dual-process theories by (Petty, Heesacker, & Hughes, 1997). In which the central route (system 2), will require cognitive effort for the development of thought. For this to happen, the individual needs the motivation to use the available information. In the peripheral route (system 1), simple cues in the environment can precede affective states or heuristics for the person to evaluate the message. Hence, in this study, it is assumed that the choices regarding the material of the products, whether meat fiber or vegetable

fiber will be influenced by system 1 for meat fiber, it is expected that this product is grounded in the Brazilian mind as an automatic food choice. And for the plant fiber system 2, as it is a new and little-known product that Brazilians need deliberation to interpret information about it. Accordingly, systems 1 and 2 will influence the function of the four attitudes.

(Katz, 1960), tries in his theory to bring together aspects of cognition and affect to explain the functions of attitudes. His definition for attitudes is similar to other authors. Attitudes are a tendency of the individual to consider a symbol, object, or perspective of his external world favorably or unfavorably to satisfy his needs and motivations (Katz, 1960). (Katz, 1960) divides the formation of attitudes into four components: beliefs, affection, attitude per se, and value system. There is a certain difference in the interpretation of (Fishbein & Ajzen, 2011) since he considers beliefs as an antecedent of attitudes. While (Ajzen, 2001), considers affection as part of attitudes. Also, affection will shape the intensity of emotions towards an object (Fishbein & Ajzen, 2011).

From what has been said above, it is possible to realize that attitudes will vary in their function and purpose. Therefore, in (Katz, 1960) functional theory that differs from other attitudes theories is that attitudes are organized into four groups based on their motivational basis. This is done to explain why individuals have certain attitudes. For this reason, an attitude towards an object may have arisen from different motivations of individuals, with which it can perform different functions. The four classifications are as follows: (1) the utilitarian function; (2) the ego-defensive function; (3) the value-expressive function; (4) the knowledge function (Katz, 1960).

The utilitarian function explains the search for an individual to increase benefits and mitigate penalties concerning the outside world. People create positive attitudes towards objects that satisfy their desires and negative attitudes towards objects that are linked to resentment or punishment. Its formation is always directed to the usefulness of the object in the present or previous experiences for the individual (Katz, 1960).

The ego-defensive function discusses people's attempts and efforts to live with themselves. They are the ego's defense mechanisms to reduce anxiety caused by internal conflicts based on unwanted or insecure pulses and to protect yourself from the outside world. The individual's way of dealing with this conflict may be to deny reality or to try to rationalize it. The formation of this type of attitude originates in the person's emotional conflicts and not in objects or situations. For this reason, it is acceptable that this type of attitude is used to protect our self-image (Katz, 1960).

The value expressive function is the function of the attitude that has positive representations of the values of an individual, enabling these values to demonstrate the type of person the individual is. This type of attitude links the personality's deepest desires to its self-image. For this reason, these attitudes are strongly linked to the way the individual perceives and sees himself concerning the world around him. These attitudes have a logical connection with the central values of an individual (Katz, 1960). It is important to note that they bring satisfaction when expressed because they are associated with the ego. Its formation and origin take place in childhood during socialization processes in these formative years. Later in life, when individuals become members of other social groups, the group's values may be internalized by the person (Katz, 1960).

The knowledge function refers to the need for people to organize and find meaning in the chaos of the complex environments that surround them. That is why these attitudes will serve as a reference criterion to understand your surroundings. It is important to remember, that people do not desperately seek knowledge but they try to understand the events that are relevant to their lives. In this way, these attitudes will serve as a support base for the individual to understand what is important in his life (Katz, 1960).

### 6.3 *Theory of Reasoned Action*

In the Theory of Reasoned Action (Fishbein & Ajzen, 2011) attitudes can be defined as evaluations. It is a psychological summary of an object or situation in different dimensions such as good-bad, dangerous-beneficial, pleasant or disgusting, like-dislike (Ajzen, 2001). It is a continuous evaluation of an object in a positive-negative dichotomy about its characteristics (Argyriou & Melewar, 2011). This definition is very close to the utilitarian function in (Katz, 1960) theory.

The formation of attitudes in this theory is based on the assumption that an individual's beliefs about the object of the attitude will serve as determinants of the attitude. Individuals construct their beliefs concerning an object based on associations between their attributes and qualities (Fishbein & Ajzen, 2011).

In this way, this theory states that individuals make use of the information at their disposal to assess whether or not they should perform a behavior. This arrangement is called an intention (Fishbein & Ajzen, 2011). The determinants of intention and behavior are attitudes. And the other determinants of attitudes are the subjective norms and the normative beliefs which are similar, these are the way that the social environment exercises influence on the attitude and intention of individuals (Fishbein & Ajzen, 2011). Thus, in this study consumer acceptance is conceptualized as the intention to purchase plant-based meat analogues or meat as disguised traditional feijoada or imported hamburger. In the case of meat and plant-based meat analogues, it is expected that there are effects caused by the culture of meat consumption in Brazil on social norms. Thus, the effects of culture and social norms can be expected in the process of forming attitudes and the intention to buy traditional feijoada or imported hamburgers made from meat or plant.

### 6.4 *Theoretical comparison*

In an analysis between the Functional Theory of (Katz, 1960) and the Theory of Reasoned Action (Fishbein & Ajzen, 2011) it is possible to state that the two theories have their formation based on system 1 and system 2. It is possible to argue that Functional Theory has more focus on understanding and explaining the role of the needs and motivations in the function of attitudes to an individual. Including the role of the value system informing the attitude, with this, a function may serve several purposes. The main focus is on attitudes. The Theory of Reasoned Action focuses on understanding the determinants of behavior and how to try to predict future behaviors of individuals. The difference regarding values is that in TRA, values are considered background factors influencing the formation of beliefs. Also, motives can affect beliefs. In the Katz, theory values are a direct component in the formation of attitudes.

Regarding the classification of the four possible functions for attitudes, it is possible to make a parallel with the Theory of Reasoned Action. In this case, The utilitarian function can be considered as an attitude in the Theory of Reasoned Action. The knowledge function is

equivalent to the beliefs and finally, the ego-defensive and value-expressive functions have great similarity with the social norms. These reasons are explained below.

Drawing a parallel between the role of the utilitarian function and attitude, the two views point out that individuals make psychological evaluations of objects in the good-bad spectrum, always based on the present or past experiences. When comparing the knowledge function and beliefs, they discuss the individual's search for knowledge about his surroundings throughout his life in experiences with behaviors, objects, situations. This knowledge serves as reference for organizing a person's internal and external world. Starting the comparison between the ego-defensive and value-expressive functions with social norms, it is possible to understand that they all demonstrate the need of individuals to express their identity and regulate their behavior according to the norms of a society or what their group suggests as appropriate. In this way, the chances of internal and external conflicts are reduced, since by following social norms the subject agrees with the identity and values of the groups (Fishbein & Ajzen, 2011; Katz, 1960).

### 6.5 *Interplay culture, individual choices, and function of attitudes*

As the focus of this study is to understand how the acceptance of plant-based meat analogues in a country with a strong meat consumption culture. It is more appropriate to use the Functional Theory of Attitudes because explains the function of attitudes and uses motivation as a baseline for individuals to develop their attitudes. Additionally, the importance of beliefs, the system of values of an individual, and identity act as a determinant in the formation of attitudes. Since it was seen in this study that values and culture influence each other (J.-B. E. Steenkamp et al., 1999; Triandis, 2002). As a result, it is expected that this theory will help to answer the research questions about the role of Brazilian meat-loving culture and characteristics of individuals in Brazil and their relationship with assessments of plant-based meat analogues and meat.

In the literature review, it was possible to understand that culture is the background of this study. In this analysis, two dimensions of culture from (D. Briley et al., 2014) are selected. The Social collective perspective means the cultural environment where the collective elements of culture are present. Within the national culture, the country's values are present (J.-B. E. Steenkamp et al., 1999) and which studies how individuals perceive this subjective cultural environment (Triandis, 2002). In this case, the meat culture in Brazil is used as a subjective reflection on how culture influences affection and cognition, such as attitudes that are context-dependent (D. Briley et al., 2014).

With these explanations above it was identified that all four concepts of Functional Theory can be chosen to compose the theoretical model as mediators. The first concepts to be explained are the ego-defensive and value-expressive functions because both represent the study of the roles of attitudes and values in the individual's identity (Katz, 1960). Being the value-expressive formed in childhood based on socialization processes and groups. In this case, a group can be considered the Brazilian society in which an individual is a part and is influenced by its cultural characteristics of meat-loving culture. And to be part of a group a person will have attitudes to protect self-image and identity in a society, here to preserve an identity of a meat eater. These reasons described serving to connect the ideas already developed in the literature review about the way social norms in culture affect people's food choices. Since values, norms, attitudes can be learned by culture (Triandis, 2002).

Hence, in this study, it is expected that the ego-defensive function and the value-expressive function will be important to mediate the relationship between the individual choices



concerning meat and plant-based analogues disguised as traditional feijoada versus imported hamburger will receive effects of the identity and values of Brazilians. Having effects on the subsequent acceptance-purchase intention of both types of products.

The other two functions from the (Katz, 1960) theory used in the model are the utilitarian function and the knowledge function. The reasons are that individuals will evaluate objects in sense of utility and benefits they provide. Said that the utility and benefits will vary depending on individual's interpretation of traditional feijoada versus imported hamburger made of meat or plant. The knowledge function, would bring the elements of the beliefs that the Brazilians already have about meat and the ones they need to develop or have little beliefs about the plant-based meat analogues. Thus, these other two functions would mediate the relationship between individual choices for meat and plant-based analogues with the possibility of influences by the utility and beliefs of Brazilians. Thus, affecting the consumer acceptance-purchase intention of both items. Considering the information presented above, it is possible to formulate the first two hypotheses of this study.

*H1: Each of the four attitude functions positively relates to consumer acceptance.*

*H2: The material meat leads to higher utilitarian, knowledge, and ego-defensive attitudes.*

Hence, one can understand that attitudes are influenced by personality traits since the psychological motivations are different in each person (Katz, 1960). And what situational characteristics also affect attitudes, as they can provide a more favorable environment or not for evaluations (D. Briley et al., 2014; Triandis, 2002). Next, the independent variables are explained.

In the theoretical model developed in this study, there are two independent variables. To try to answer what determines the acceptance of plant-based meat analogues in Brazil. There are two assumptions that the product material meat or plant and type of product traditional feijoada and imported hamburger will influence the opinion of consumers.

The concept of national culture demonstrates the influence of culture and social norms when it comes to individuals' food choice (J.-B. E. Steenkamp et al., 1999; Triandis, 2002). Making it possible to connect these concepts with the social and cognitive perspectives presented by (D. Briley et al., 2014) who in this study is used to explain the link between culture, attitudes, and consumer acceptance. That said, it is possible to affirm that value-expressive attitudes represent the central values of an individual and his personality concerning the outside world (Katz, 1960). With this, it is possible to formulate the third hypothesis of the study.

*H3: A traditional product (feijoada) compared to the imported product (hamburger) will elicit higher value-expressive attitudes.*

For all the influence exerted by the meat consumption culture in Brazil and its relationship to local cuisine (Aguiar, 2019; MEDRADO, 2013) these are part of the social norms and values that represent Brazilians. It is estimated that this combination serves to accentuate the attitudes related to the value-expressive function (Katz, 1960). Thus, the fourth hypothesis was developed

*H4: Meat in combination with the traditional products (feijoada) will elicit even higher Value-expressive attitudes.*

As a moderator in this theoretical model, the occasion of consumption with two levels named street and home was selected. Based on Brazilian culture, social life can be divided between street and home (Da Matta, 1984). The street represents the struggle for survival and works where movement and anonymity exist, being an impersonal and egalitarian environment. Accordingly, street food can present risks such as being dangerous or bad taste. Contrarily the home is the place of comfort and harmony. Where family and group traditions prevail in a more hierarchical system. Also, is a place always open to receive friends with abundant food. and where food is considered to be better than on the street (Da Matta, 1984).

With those statements above, it is possible to connect with the theory of (Elzerman et al., 2011) about the consumption context in the acceptance of plant-based meat analogues. The importance that the value-expressive function has on the expression of an individual's values. These personal values would be in vogue when eating on the street. Because is supposed that consuming food on the street and in theory in front of the public. Would carry a symbolic value. This act serves to demonstrate the values and social class of the consumer depending on their food choices. This is related to conspicuous consumption, where the consumer is delighted to demonstrate a certain social position based on its consumption choices (Barauskaite et al., 2018). Next, the ego-defensive function is useful to project the individual's self-image and identity. Thus, is expected that by eating at home this function would be enhanced. A household is a place where social norms and family members identity is shared. Accordingly, the consumption practices have symbolic meanings that are under the family practices and self-identity of its members (Cappellini & Parsons, 2012).

*H5: The consumption occasion (eating on the street) with friends would lead to a stronger influence of the value-expressive function on consumer acceptance/purchase intention.*

*H6: The consumption occasion (eating at home) with family would lead to a stronger influence of the ego-defensive function on consumer acceptance/purchase intention.*

Concluding the model explanation, it is possible to affirm that the biggest contribution of the Theory of Reasoned Action (Ajzen, 2001) to this research is on the intention concept to buy or not traditional feijoada or hamburger in the versions of meat or plant. Always basing the analysis on the mediation performed by the four functions of the attitudes of the Katz Theory (Katz, 1960). For the utilitarian function, ego-defensive function, value-expressive function, knowledge function together achieve prediction of intention. That is why it makes sense to use intention as an outcome variable to measure consumer acceptance of traditional feijoada versus imported hamburgers made of meat or plant. In the next chapter, the method section is developed.

## 7 Methods

In this chapter, the participants, research design, stimuli, measurements, procedure, and analysis plan will be described.

### 7.1 Participants

This study is conducting using participants from Brazil of both genders from 18 to 99 years old. The questionnaire was developed in English and later translated into Portuguese. To recruit

participants the link to the Qualtrics survey would be shared on social media. The target is to have 120 participants.

### 7.2 Research design

The Qualtrics program was used to create the survey. The research design is a full factorial experimental mixed design 2x2x2. Two products within-subject X two materials within-subjects X two consumption occasion between subjects mixed design (see Table 1).

Table 1  
*Groups in a 2x2x2 factorial design*

<i>Group</i>	<i>X1 Product</i>	<i>X2 Material</i>	<i>X3 Consumption Occasion</i>
1	<i>Traditional</i>	<i>Meat</i>	<i>Street</i>
2	<i>Traditional</i>	<i>Plant</i>	<i>Street</i>
3	<i>Imported</i>	<i>Meat</i>	<i>Street</i>
4	<i>Imported</i>	<i>Plant</i>	<i>Street</i>
5	<i>Traditional</i>	<i>Meat</i>	<i>Home</i>
6	<i>Traditional</i>	<i>Plant</i>	<i>Home</i>
7	<i>Imported</i>	<i>Meat</i>	<i>Home</i>
8	<i>Imported</i>	<i>Plant</i>	<i>Home</i>
	<i>Within Subjects</i>	<i>Within Subjects</i>	<i>Between Subjects</i>

### 7.3 Stimuli

Before answering the questions, all participants will receive a short standard story as an introduction to the topic. Afterward, they will be presented to different stories and images allocated in a randomized way. In the group's stories, information about the three factors presented above is manipulated: Product, Material, and Consumption Occasion. To operationalize those concepts, there is this selection: Material was manipulated with two levels meat and plant. Next, the product was manipulated as traditional feijoada and imported hamburger food products. Finally, the moderator variable consumption Occasion is presented in two categories: eating on the street or eating at home.

Baseline story for all consumption occasion: *Brazil has a rich, tasty and diverse cuisine. Food consumption is highly dependent on cultural, social and historical influences. These different aspects have an effect on how foods are chosen and on what occasions of consumption they are most appropriate.*

Description plant-based meat analogues: *Plant-based meat analogues are foods that imitate the natural characteristics of meat. Such as taste, texture and appearance. They are produced using vegetables or legumes such as soya beans, pulses, peas and other grains. Proteins are extracted from those vegetables to form structures similar to that of animal meat.*

Baseline story for street consumption occasion:

*Today you are on the street at lunchtime. The weather is sunny and beautiful that you decide to stay and have a street lunch with friends. When you feel hungry, you enter a restaurant.*

Baseline story for home consumption occasion:

*Today you are at home at dinnertime. You are feeling happy and enthusiastic then you decide to have a home dinner with your family. When you feel hungry, you start to prepare.*

*Group 1: In the restaurant your order is a feijoada made with meat.*

*Group 2: In the restaurant your order is a feijoada made with plant-based meat analogues.*

*Group 3: In the restaurant your order is a hamburger made with meat.*

*Group 4: In the restaurant your order is a hamburger made with plant-based meat analogues.*

*Group 5: In your house you prepare a feijoada made with meat.*

*Group 6: In your house you prepare a feijoada made with plant-based meat analogues.*

*Group 7: In your house you prepare a hamburger made with meat.*

*Group 8: In your house you prepare a hamburger made with plant-based meat analogues.*

Stimuli images are used with each group story for the street and home consumption occasion.



*Figure 2. Traditional Feijoada Meat.*



*Figure 3. Traditional Feijoada Plant.*



Figure 4. Imported Hamburger Meat.



Figure 5. Imported Hamburger Plant.

#### 7.4 Measurement's:

The main concepts that were measured in this study are the four functions of attitudes and consumer acceptance/intention to buy. Moreover, information from the respondents to describe the sample.

The value-expressive function was measured using the question “*Choosing this food demonstrates my values.*” used in the study by (Grewal, Mehta, & Kardes, 2004) to measure value-expressive function. With a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) where the participants were asked whether or not they agreed with the statement of the question.

The ego-defensive function was measured using the question “*Consuming this food is a symbol of social status.*” used in This study to measure social-adjustive function which in the case of this study was interpreted as ego-defensive function (Grewal et al., 2004). With a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) where the participants were asked whether or not they agreed with the statement of the question.

The utilitarian function was measured using the question “*Whenever I eat this food, I am happy.*” used in the study of (Grewal et al., 2004) to measure the utilitarian function. With a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) where the participants were asked whether or not they agreed with the statement of the question.

The knowledge function was measured using the question “*Consuming this food facilitates my routine and the organization of my day-to-day life.*” used in the study of (Grewal et al., 2004) to measure knowledge function. With a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) where the participants were asked whether or not they agreed with the statement of the question.

The consumer acceptance/purchase intention was measured using the question “*What are the chances that you will buy this food in the next 4 weeks?*” on a 7-point Likert scale (1 = certainly not to 7 = certainly would) based on the study of (McDonald & Alpert, 2001).

### 7.5 *Demographics and meat consumption intake*

To understand the sample characteristics, all participants answered questions about their gender, date of birth, education level, income, city/state. Also, this question “*On average, how many times per week do you eat meat? This includes breakfast, lunch, dinner and snacks.*” on a scale from 1-14 times a week about meat consumption. Furthermore, the question about diet description “*Which of the following applies to you, with regard to the frequency of meat consumption? I am vegan/vegetarian (I do not consume meat); I am flexitarian (I deliberately decrease the frequency of my meat consumption); I am a meat consumer without restrictions.*” the two questions were based on multiple-choice scale based on the study by (Eenhoorn, 2018).

### 7.6 *Procedure*

In the month of April 2021 participants were recruited by advertisements on social networks (What’s app, Facebook, Instagram, LinkedIn) disseminating the link to the questionnaire in the Qualtrics software. On the first page, (see Appendix I) of the questionnaire, the theme, the objective of the research, and information about the researcher was introduced. It was mentioned that participation is voluntary, anonymous, and confidential with data protection. With this, it was asked if the participants agreed with the informed consent.

After the introduction, participants will be randomly assigned to the street or the home situation, read the baseline introduction story about the consumption occasion, and description of plant-based meat analogues. After, they will read the baseline story for the assigned consumption occasion. Next, they will visualize the images for the four products within traditional feijoada/imported hamburger and the material within meat/plant in a randomized order. After this manipulation, it's time to answer the four questions about the functions of attitudes, one question regarding consumer acceptance/purchase intention. On those pages, there will be a message on how to answer a Likert scale (see Appendix II). Ending the questionnaire respondents would answer five questions about personal information and two questions related to meat consumption behavior.

### 7.7 *Analysis plan*

Hypothesis 1 is tested by multiple linear regression with the four functions of attitudes as continuous predictors. Together they predict one continuous outcome that is the consumer acceptance/purchase intention.

Hypothesis 2 is tested by repeated-measures analysis of variance tests on variables material and product that would affect the four functions of attitudes constructs (value-expressive, ego-defensive, utilitarian, knowledge) in a series of analyses.

Hypothesis 3 and 4 are tested together by repeated-measures analysis of variance tests with interaction terms provided by the independent variables material and product in a 2-way design in combination with the mediator value-expressive function.

Hypothesis 5 and 6 are tested by a hierarchical linear model with contrast coding of -1 and +1 on consumption occasion to control multicollinearity. As a result, is expected some correlation between the functions of attitudes.

## 8 Results

### 8.1 Sample Description

The data collection was conducted between 09-April-2021 until 14-April-2021. The sample size consisted of total of 240 respondents from Brazil, out of which 41 were removed from the dataset because they answered less than 60% of the survey questions. The remaining 199 responses were used in the analysis. In general, the participants completed the survey in 5:30 minutes. Participants aged between 18 and 91 years old. The mean age was 43 years old. There were more female participants (68.4%) than male participants (31.1%). The level of education was relatively high with 83.2% of participants holding a university diploma. Most respondents were eating meat regularly: 17.8% indicated meat consumption 14 times a week compared to another 16.1% of participants whom were consuming meat 7 times a week. The dietarian pattern was formed by 55% of respondents describing themselves as meat-eaters, followed by 33.9% of flexitarians and 11.1% of vegans/vegetarians. The respondents were composed of different regions of Brazil, especially from the Rio Grande do Sul (52.3%), São Paulo (25.6%), and Rio de Janeiro (7.0%) states (see Table 2).

Table 2  
*Sample Demographics*

	<i>Brazil</i>
<i>Number of respondents</i>	199
<i>Gender (% contribution)</i>	
<i>Male</i>	61 (31.1%)
<i>Female</i>	134 (68.4%)
<i>Age in years: Mean</i>	43.47
<i>Education level</i>	
<i>University degree</i>	163 (83.2%)
<i>Vocational training</i>	7 (3.6%)
<i>High School</i>	12 (6.1%)
<i>Other</i>	14 (7.1%)
<i>Times of weekly meat intake</i>	
<i>1</i>	24 (13.3%)
<i>7</i>	29 (16.1)
<i>10</i>	20 (11.1%)
<i>14 or more</i>	32 (17.8%)
<i>Dietarian behaviour</i>	
<i>Vegan/vegetarian</i>	20 (11.1%)
<i>Flexitarian</i>	61 (33.9%)
<i>Meat consumer</i>	99 (55%)

### 8.2 Hypotheses

To test hypothesis 1 “*Each of the four attitude functions positively relates to consumer acceptance.*”

To test H1, the data was restructured, so that the within-participant manipulations of products traditional feijoada or imported hamburger and material meat or plant were presented as units of analysis. Thus, each participant appeared four times. Then, multiple linear regression tests

were conducted to verify the prediction effects of the four attitude functions on consumer acceptance/purchase intention for traditional feijoada and the imported hamburger consisting of meat or plant.

For all respondents, a significant regression equation was found ( $F(4,791) = 193.335, p < .001$ ;  $R^2 .494$ ). Utilitarian function ( $\beta = .568, p < .001$ ) and knowledge function ( $\beta = .291, p < .001$ ) were significant predictors of consumer acceptance/purchase intention. While the value-expressive function ( $\beta = .024, p = .446$ ) and ego-defensive function ( $\beta = -.061, p = .090$ ) was not a significant predictor (see Table 3). Thus, the results partially support H1. To obtain a better understanding of where the different products resulted in the different effects of the attitude functions. There was a separate analysis of the attitude function's impact on consumer acceptance/purchase intention for the four within-participant conditions. It was noticed that similar to the overall measure in all these cases the utilitarian and knowledge function have an effect and the others do not (see Table 3 for details). In addition to the main analysis, Table 3 also reports the regression weights for each of the 4 within-participant conditions separately, showing similar patterns of significant relations regardless of the product and material.

Table 3  
Coefficients of the four attitude functions on consumer acceptance/purchase intention

<i>n=796</i>		$\beta$	Std. Error	<i>t</i>	<i>p</i>	VIF
<i>Predictors: Constant, Value Expressive f., Ego-defensive f., Utilitarian f., Knowledge f.</i>						
<i>Constant</i>		.143	.149	.956	.340	
<i>Dependent Variable: Purchase Intention</i>						
<i>Value-Expressive f.</i>		.024	.031	.763	.446	1.508
<i>Ego-Defensive f.</i>		-.061	.036	-1.698	.090	1.304
<i>Utilitarian f.</i>		.568	.033	16.984	.001	1.526
<i>Knowledge f.</i>		.291	.035	8.208	.001	1.508
<hr/>						
<i>Additional analyses - Coefficients for within conditions n=199</i>						
<i>Traditional Feijoada</i>						
<i>Material Meat</i>						
<i>Constant</i>		.333	.310	1.075	.284	
<i>Value-Expressive f.</i>		.045	.061	.743	.458	1.373
<i>Ego-Defensive f.</i>		-.129	.082	-1.578	.116	1.308
<i>Utilitarian f.</i>		.566	.058	9.685	.001	1.220
<i>Knowledge f.</i>		.271	.070	3.857	.001	1.223
<i>Imported Hamburger</i>						
<i>Material Meat</i>						
<i>Constant</i>		.101	.274	.370	.712	
<i>Value-Expressive f.</i>		.071	.061	1.165	.246	1.631
<i>Ego-Defensive f.</i>		-.084	.065	-1.291	.198	1.288
<i>Utilitarian f.</i>		.395	.071	5.566	.001	1.748
<i>Knowledge f.</i>		.332	.071	4.695	.001	1.538
<i>Traditional Feijoada</i>						
<i>Material Plant</i>						
<i>Constant</i>		.247	.318	.779	.437	



	<i>Value-Expressive</i>					
	<i>f.</i>	-.009	.060	-.154	.878	1.371
	<i>Ego-Defensive f.</i>	.026	.073	.353	.724	1.277
	<i>Utilitarian f.</i>	.685	.064	10.745	.001	1.398
	<i>Knowledge f.</i>	.221	.066	3.340	.001	1.407
<i>Imported Hamburger</i>						
<i>Material Plant</i>	<i>Constant</i>	.013	.273	.047	.962	
	<i>Value-Expressive</i>					
	<i>f.</i>	.123	.066	1.863	.064	1.890
	<i>Ego-Defensive f.</i>	-.041	.064	-.647	.518	1.294
	<i>Utilitarian f.</i>	.470	.078	5.989	.001	2.351
	<i>Knowledge f.</i>	.298	.078	3.819	.001	2.134
	<i>Mean</i>					
<i>Sum of squares</i>	<i>Square</i>					
<i>Regression</i>	1735.564	433.891				
<i>Residual</i>	1775.193	2.244				

Hypotheses 5 and 6 compliment the results of hypothesis 1. To test hypotheses 5 “*The consumption occasion (eating on the street) with friends would lead to a stronger influence of the value-expressive function on consumer acceptance/purchase intention.*”

The restructured data used in testing hypothesis 1 was used as the baseline for testing hypotheses 5 and 6 using a hierarchical linear model, with participant number to indicate repeated measure with a random intercept per participant. Fixed effects of the functions, the consumption occasion, and the interaction of consumption occasion (effect coded), and each function were estimated (see Table 4). The dependent variable was consumer acceptance/purchase intention. The main effects of the functions value-expressive, ego-defensive, utilitarian and knowledge are similar to multiple linear regression results reported in Table 3 for hypothesis 1. The simpler test multiple linear regression was used in hypothesis 1 for finding the beta weights. Moreover, the more advanced hierarchical linear model used in hypotheses 5 and 6 was used to verify the p-values. As both tests showed similar results using the same data the conclusion is the analyses are robust.

For all the respondents the consumption occasion eating on the street does not have significant moderation interaction effect with the value-expressive function ( $F(1,782.324) = .555$  p-value = .457) (see Table 4). Thus, the results do not support hypothesis 5.

*And Hypothesis 6 “The consumption occasion (eating at home) with family would lead to a stronger influence of the ego-defensive function on consumer acceptance/purchase intention.”*

For all the respondents the consumption occasion eating at home does not have significant moderation interaction effects with the ego-defensive function ( $F(1,762.943) = .375$ ,  $p = .541$ ). While the moderation interaction effects of consumption occasion is significant for the utilitarian function ( $F(1,740.696) = 14.532$ ,  $p < .001$ ) and for the knowledge function ( $F(1,778.931) = 3.806$ ,  $p = .051$ ) (see Table 4). Thus, the results does not support hypothesis 6.

Table 4

*The main and interaction effects of consumption occasion and the four functions of attitude interactions on consumer acceptance/purchase intention*

<i>Effects</i>	<i>Denominator df</i>	<i>F</i>	<i>p</i>
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<i>Intercept</i>	.000	.599	.439
<i>Consumption Occasion</i>	765.305	.117	.732
<i>Value-Expressive f.</i>	782.324	.344	.558
<i>Ego-Defensive f.</i>	762.943	2.242	.135
<i>Utilitarian f.</i>	740.696	296.269	.001
<i>Knowledge f.</i>	778.931	69.723	.001
<i>Consumption Occasion x Value- expressive f.</i>	782.324	.555	.457
<i>Consumption Occasion x Ego- defensive f.</i>	762.943	.375	.541
<i>Consumption Occasion x Utilitarian f.</i>	740.696	14.532	.001
<i>Consumption Occasion x Knowledge f.</i>	778.931	3.806	.051

To test hypothesis 2 “*The material meat leads to higher utilitarian, knowledge, and ego-defensive attitudes.*”

H2 was tested using repeated measures analysis of variance tests, repeatedly for one attitude function. Following this order: value-expressive, ego-defensive, utilitarian, and knowledge function as the dependent variable. Material meat or plant was used as a within factor and a second within factor was whether it was a product traditional feijoada or an imported hamburger.

The main effect of the material meat versus plant for the value-expressive function was significant (Wilk’s lambda .972,  $F(1,197) = 5.664$ ,  $p = .018$ ;  $\eta^2 = .028$ ). Next, the main effect of the material meat versus plant for the ego-defensive function was significant (Wilk’s lambda .915,  $F(1,197) = 18.223$ ,  $p = .001$ ;  $\eta^2 = .085$ ). Next, the main effect of the material meat versus plant for the utilitarian function was significant (Wilk’s lambda .979,  $F(1,197) = 4.124$ ,  $p = .044$ ;  $\eta^2 = .021$ ). Finally, The main effect of the material meat versus plant for the knowledge function was not significant (Wilk’s lambda .999,  $F(1,197) = .210$ ,  $p = .647$ ;  $\eta^2 = .001$ ) (see Table 5). Thus, the results partially support hypothesis 2.

Table 5  
*The effects of material and product on the four functions of attitudes*

<i>Effect</i>	<i>Wilks' Lambda</i>	<i>F</i>	<i>p</i>	<i>Partial Eta Squared</i>
<i>Value-expressive f.</i>				
<i>Material Meat on Plant</i>	.972	5.664	.018	.028
<i>Product traditional feijoada on Imported Hamburger</i>	.991	1.876	.172	.009
<i>Material X Product</i>	.998	.381	.538	.002
<i>Ego-defensive f.</i>				
<i>Material Meat on Plant</i>	.915	18.223	.001	.085
<i>Product traditional feijoada on Imported Hamburger</i>	.959	8.356	.004	.041
<i>Material X Product</i>	.999	.114	.735	.001
<i>Utilitarian f.</i>				

<i>Material Meat on Plant</i>	.979	4.124	.044	.021
<i>Product traditional feijoada on</i>				
<i>Imported Hamburger</i>	.984	3.154	.077	.016
<i>Material X Product</i>	1.000	.016	.898	.001
<i>Knowledge f.</i>				
<i>Material Meat on Plant</i>	.999	.210	.647	.001
<i>Product traditional feijoada on</i>				
<i>Imported Hamburger</i>	.848	35.300	.001	.152
<i>Material X Product</i>	.997	.528	.468	.003

To test hypothesis 3 “A traditional product (feijoada) compared to the imported product (hamburger) will elicit higher value-expressive attitudes.”

H3 and H4 were tested using repeated-measures analysis of variance tests, with value-expressive function as the dependent variable. Material meat or plant was used as a within factor and a second within factor was whether it was a product traditional feijoada or imported hamburger.

H3: The main effect of product traditional feijoada versus imported hamburger was not significant for the value-expressive function (Wilk’s lambda .991,  $F(1,197) = 1.876$ ,  $p = .172$   $\eta^2 = .009$ ) (see Table 5). Thus, the results do not support hypothesis 3.

Hypothesis 4 “Meat in combination with the traditional products (feijoada) will elicit even higher Value-expressive attitudes.”

H4: The interaction effect of material meat in combination with product traditional feijoada was insignificant for the value-expressive function (Wilk’s lambda = .998,  $F(1,197) = .381$ ,  $p = .538$   $\eta^2 = .002$ ) (see Table 5 and Table 6). The choice of product traditional feijoada made of meat does not lead to higher value-expressive function. Thus, the results do not support hypothesis 4.

Table 6

*Attitude functions means for material and product on the between condition*

<i>Attitude function</i>	<i>Consumption Occasion</i>	<i>Mean</i>	<i>Std. Deviation</i>
<i>Value-expressive f.</i>			
<i>Material Meat on Traditional Feijoada</i>	<i>Home</i>	3.54	1.99
	<i>Street</i>	3.47	2.04
<i>Material Meat on Imported Hamburger</i>	<i>Home</i>	3.70	2.04
	<i>Street</i>	3.47	2.14
<i>Material Plant on Traditional Feijoada</i>	<i>Home</i>	3.80	2.05
	<i>Street</i>	3.90	2.13
<i>Material Plant on Imported Hamburger</i>	<i>Home</i>	3.86	2.06
	<i>Street</i>	4.20	2.17
<i>Ego-defensive f.</i>			
<i>Material Meat on Traditional Feijoada</i>	<i>Home</i>	2.68	1.46
	<i>Street</i>	2.48	1.46
<i>Material Meat on Imported Hamburger</i>	<i>Home</i>	2.78	1.57

	<i>Street</i>	2.85	1.73
<i>Material Plant on Traditional Feijoada</i>	<i>Home</i>	3.27	1.87
	<i>Street</i>	2.85	1.63
<i>Material Plant on Imported Hamburger</i>	<i>Home</i>	3.29	1.86
	<i>Street</i>	3.20	1.81
<i>Utilitarian f.</i>			
<i>Material Meat on Traditional Feijoada</i>	<i>Home</i>	4.59	1.93
	<i>Street</i>	4.06	1.99
<i>Material Meat on Imported Hamburger</i>	<i>Home</i>	4.71	1.91
	<i>Street</i>	4.24	2.02
<i>Material Plant on Traditional Feijoada</i>	<i>Home</i>	3.85	1.92
	<i>Street</i>	4.02	1.83
<i>Material Plant on Imported Hamburger</i>	<i>Home</i>	3.98	2.01
	<i>Street</i>	4.16	1.99
<i>Knowledge f.</i>			
<i>Material Meat on Traditional Feijoada</i>	<i>Home</i>	3.16	1.67
	<i>Street</i>	2.70	1.65
<i>Material Meat on Imported Hamburger</i>	<i>Home</i>	2.91	1.69
	<i>Street</i>	3.19	1.81
<i>Material Plant on Traditional Feijoada</i>	<i>Home</i>	3.74	1.87
	<i>Street</i>	3.47	1.95
<i>Material Plant on Imported Hamburger</i>	<i>Home</i>	3.46	1.93
	<i>Street</i>	3.78	1.90
<hr/>			
<i>Consumer Acceptance/Purchase Intention Traditional Feijoada Meat</i>	<i>Home</i>	3.31	2.03
	<i>Street</i>	3.46	1.98
<i>Consumer Acceptance/Purchase Intention Traditional Feijoada Plant</i>	<i>Home</i>	2.27	1.62
	<i>Street</i>	3.08	1.97
<i>Consumer Acceptance/Purchase Intention Imported Hamburger Meat</i>	<i>Home</i>	4.19	2.18
	<i>Street</i>	4.10	2.22
<i>Consumer Acceptance/Purchase Intention Imported Hamburger Plant</i>	<i>Home</i>	3.18	2.09
	<i>Street</i>	3.54	2.12
<hr/>			

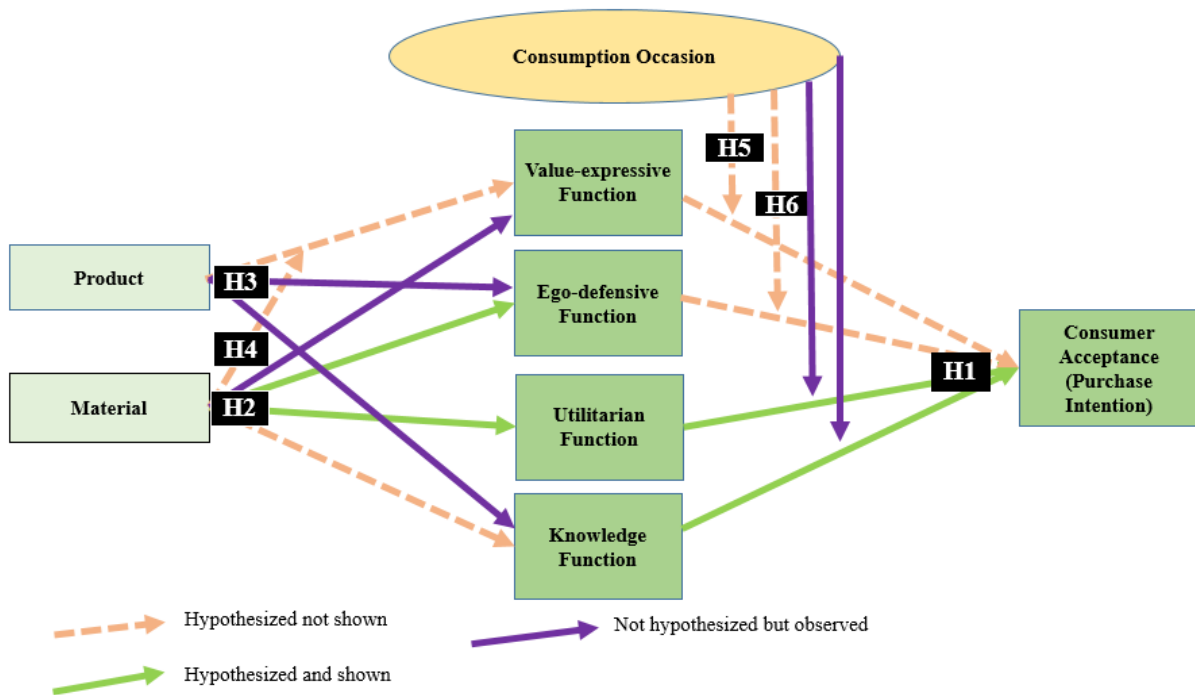


Figure 6. Revised model; in rosy color hypothesized not shown; green color hypothesized and show; purple color not hypothesized but observed.

## 9 Discussion

The hypotheses results indicate that it is possible to affirm based on the assumptions made from literature review and during the development of the theoretical model. The functions value-expressive and ego-defensive both representing the culture and social norms effects would be more relevant than the knowledge function which are the utilitarian beliefs, including the general attitudes. However, after testing all hypotheses it was possible to verify that for consumers the suggestion is that the knowledge and utility functions are the two most important parameters while selecting traditional feijoada when compared to imported hamburgers made of meat or plant.

Additionally, the consumption occasion, such as eating on the street or at home does not greatly influence Brazilians' choices. Finally, the Brazilians attachment to meat, come to the forefront, showing that when selecting the product for meals, Brazilians prefer meat over plant-based meat analogues, thus the value-expressive and ego-defensive functions are valid in this choice, demonstrating the effects of culture and social norms.

The results for hypothesis 1 demonstrate that only the utilitarian and knowledge functions have a positive relationship on consumer acceptance/purchase intention. It was expected that based on the functions of attitudes (Katz, 1960), all the value-expressive, ego-defensive, knowledge, and utilitarian functions collectively would present a positive relationship with consumer acceptance/purchase intention.

The utilitarian and knowledge functions discuss the positive and negative evaluations and beliefs on the objects in the traditional case of feijoada or imported hamburger made of meat or plant and its usefulness; Including the knowledge and previous experience of using the product as an evaluation criterion (Villegas et al., 2008). This suggests that Brazilian consumers are possibly pragmatists opting for established foods that provide hedonic benefits based on sensory

characteristics and functional benefits (Batra & Ahtola, 1991). In line with (Hoek et al., 2011) theorized hypotheses, is confirmed that product-related beliefs are more important than person-related beliefs. The product-related beliefs discuss the sensory aspects and product use which are similar to the representation of the utilitarian and knowledge functions. Furthermore, the person-related beliefs the representation of concerns for the environment and health, that in this study case are more aligned with the value-expressive and ego-defensive function constructs.

Hypotheses 5 and 6 complement the results of hypothesis 1. The results again show that for Brazilian consumers utility and knowledge of a product are important in their consumption behavior. This result demonstrates that the Brazilian consumer is curious about the quality and hazards of food when eating on the street. Moreover, when at home opt for foods with good taste making these evaluations based on the utilitarian and knowledge functions.

In hypothesis 5, it was expected that the role of value-expressive function would be very influential in the acceptance of traditional feijoada and imported hamburger made of plant or meat when eating on the street. As a result, consumers would demonstrate their core values in their food choices (Hayley, Zinkiewicz, & Hardiman, 2015). In Hypothesis 6 presented the expectation, that the ego-defensive function, principally, the identity would be relevant. Finally, the moderator's consumption occasion eating on the street or eating at home interaction with the four functions of attitudes was verified. (Da Matta, 1984) states that Brazilian social life is divided between the street and the home. Along the street, food present a potential health risk and poor tastiness, while at home, food is considered better quality and taste which are more or less aligned with the results of hypotheses 5 and 6.

Next is the discussion of hypotheses 2, 3, and 4. The result of hypothesis 2 was partially confirmed. Since the main effect of consumer acceptance/purchase intention of plant versus material meat was significant for three different functions – value expressive, ego-defensive, utilitarian. However, the knowledge function was insignificant. In hypothesis 2 it was expected that due to the strong culture of meat consumption in Brazil (Barcellos et al., 2007) the material meat would have a greater effect compared to the material plant on the decision-making process. Leading to a greater expression of ego-defensive, utilitarian, and knowledge function. That said, the effects of the meat consumption culture in Brazil are quite influential for people preferring material meat compared to the plant. Therefore suggesting a strong meat attachment throughout the country (Graça et al., 2015). Furthermore, confirming the importance of cultural and personal values in food choices (D. Briley et al., 2014; J.-B. E. Steenkamp et al., 1999; Triandis, 2002).

Additionally, the other significant effect of the ego-defensive function were the consumers preferences for hamburgers over feijoada independent of the meat or plant material. This could indicate that the Brazilians enjoy novelty, as hamburgers are more modern food and feijoada is more traditional food, prepared by older family members. Perhaps the preference for hamburgers could allow certain groups to demonstrate their knowledge of other cultures, creating a distinction compared to other groups (Caldwell, 2014). Finally, for the knowledge function, there was also a preference for hamburgers over feijoada independent of the material. Indicating that Brazilians today have more knowledge about hamburger than feijoada. The preference to eat hamburgers could be connected to the rise of consumption of processed and ultra-processed foods in Brazil over the years compared to natural foods (Belik, 2020).

The results of hypothesis 3 present the value-expressive function as less important while choosing between the product traditional feijoada and imported hamburger. It was expected that the traditional feijoada a national dish, would be preferred by Brazilians over the imported hamburger. Therefore, leading to considerable effects on the expression of value-expressive function demonstrating the values and personality of being a typical Brazilian that enjoy meat consumption (Aguiar, 2019; Belik, 2020; Brasil, 2014; IBGE, 2020).

Concluding with hypothesis 4, the result shows that there is no significance for the value-expressive function when combining the material meat with the product traditional feijoada. Due to the cultural influence of meat consumption and the traditional feijoada being the national dish, this combination would be the definitive expression and option of choice for the Brazilian consumer, leading to a high degree of value-expressive function. This may indicate that Brazilians prefer hamburgers because they are fast, tasty, convenient and easy to prepare. (Brunner, Van der Horst, & Siegrist, 2010). The feijoada, on the other hand, requires several ingredients and takes between one and two hours to prepare and serve. Finally, culture and social norms are important but do not play a major role in the consumption behavior for plant-based meat analogues in Brazil as demonstrated by the results of hypothesis 4.

It is arguable that in a short period difficulties and temporary obstacles of accepting plant-based meat analogues in Brazil are the meat consumption culture and the social norms, represented in the model by the value-expressive and ego-defensive functions. However, over a long period plant-based meat analogues acceptance in Brazil is focused on the knowledge about plant-based meat analogues and their usefulness, represented in the model by the knowledge and utilitarian function.

In order to increase the consumer acceptance of plant-based meat analogues the knowledge function or beliefs represent the consumers' knowledge about plant-based meat. Consumers should analyze sensory characteristics such as price, quality, taste, and knowledge skills for preparation (McEachern, Seaman, Lea, Worsley, & Crawford, 2005). To suppress this lack of knowledge, it is interesting to communicate the benefits of a plant-based diet for a healthy lifestyle, animal welfare, sustainability, and environmental impact. Also, the dissemination of product information in communication campaigns and packaging used in meal contexts and opportunities to try them (Graça, Godinho, & Truninger, 2019). Finally, this education tends to increase the familiarity and knowledge about these new products. Thus, the short term obstacles such as the meat consumption culture and social norms would slowly diminish these effects. It is likely that over time the degree of acceptance increases due to this exposure.

The utilitarian function or general attitude mentioned in the Theory of Reasoned Action (Fishbein & Ajzen, 2011) and Theory of Planned Behavior (Ajzen, 1991) is based on beliefs and social norms. Thus, if the beliefs start to change it is expected that the attitudes will modify similarly. The literature demonstrates that positive attitudes about health, longevity, healthy diets, and the environment positively affects the formation of these attitudes about plant-based meat analogues (Cliceri, Spinelli, Dinnella, Prescott, & Monteleone, 2018; Vainio, Irz, & Hartikainen, 2018). Individuals with positive attitudes about meat consumption and sensory perceptions have more difficulty in forming positive attitudes towards plant-based meat analogues (Graça et al., 2019). These positive attitude towards meat consumption may impact individuals by experiencing a sense of loss when trying to modify a habit. Therefore, it is important to highlight positive motivations about having a healthy lifestyle and pleasure from

consuming plant-based meat analogues (Cliceri et al., 2018; Graça et al., 2019). As mentioned above, long-term change may occur with a focus on the knowledge and utilitarian function as constructs that predict and explain plant-based meat analogues acceptance in Brazil.

Noticeably also found in the study was that Brazilian individuals have a specific preference for meat which may create obstacles. These obstacles mentioned in the literature below can be considered more recent. The function value-expressive and ego-defensive attitude show that individuals who like meat for different reasons may face conflicts in their values and identity because they are accepting a new food that is the plant-based meat analogues (Schenk, Rössel, & Scholz, 2018; Slade, 2018). Also, social norms can generate constraints on food choices whereas individuals tend to be happier making food choices according to their values and identities (Schenk et al., 2018).

Furthermore, the degree of food consciousness possessed by individuals would influence food choices based on its health impact, environmental, and animal welfare. This will influence the beliefs and attitudes formation (Bryant & Sanctorum, 2021; Cliceri et al., 2018). Those who identify themselves as meat consumers may realize that plant-based meats do not satisfy their sensory and nutritional needs. And a new influx of information about plant-based meat and beliefs and attitudes can generate a cognitive dissonance in prior beliefs and attitudes (Vainio et al., 2018).

It is worth remembering that dietary changes may require greater involvement of system 2, requiring deliberation on plant-based meat analogues. Thus, modifying beliefs and attitudes can serve as messages processed by the central route, requiring cognitive focus. Therefore these messages are excluded as automatic mental processes (Petty et al., 1997)

Finally, with the practical side of theoretical interpretation, it is possible to suggest how packaging and certificate details communicate the plant-based meat analogues (Curtain & Grafenauer, 2019). Another suggestion is the use of hybrid products composed of meat and plants for a smoother and more subtle transition (He et al., 2020).

### 9.1 *Managerial Implications*

As it was demonstrated in the results, for the introduction of plant-based meat analogues in Brazil to be successful, it is necessary to consider that foods conceptualized as convenient in the hamburger case. Thereby hamburgers have higher success rate, due to simple production including tastiness and convenience preparation for local consumers. All of these arguments indicate that Brazilians prefer practical foods and convenience when referring to eating, a trend in modern life that is also identified in other countries (Brunner et al., 2010). This is relevant for industries that already produce or contemplate the development of plant-based meat analogues.

Another consideration is that imported foods such as hamburgers have elements of status (Johnston & Baumann, 2007), that could influence consumers preference for this type of foods over traditional options. Consumers would opt for consuming a food that is considered imported to differentiate themselves from their social groups. As the study by Roos suggests high social status is related to the consumption of modern foods and high-status foods. While low social status is associated with the consumption of more traditional and low-status foods (Roos, Lahelma, Virtanen, Prättälä, & Pietinen, 1998).



The benefits of these results for marketing managers and institutions are that plant-based meat analogues marketing campaigns in Brazil should focus on product description, production processes, health and environmental benefits. Since there is a knowledge gap concerning these new products as mentioned by the survey respondents, it is also worth mentioning that for these campaigns it is useful to emphasize the utilitarian and functional benefits of the products. These benefits, are more important than cultural elements or social norms when choosing between plant and meat products, as demonstrated in the results section.

## 9.2 *Theoretical Implications*

This study contributes to the literature development on plant-based meat analogues acceptance in the Brazilian context, where there are few studies on this topic. Also, it is possible to affirm the partial use of the Katz attitudes theory (Katz, 1960), which, despite being old, continues to have partial relevance in explaining people's attitudes.

Thus, it was interesting to use the functional theory to understand the motivational and personality aspects in forming attitudes. As this theory divides functions into four concepts, it was possible to understand in more depth and detail the aspects of beliefs (knowledge function), social norms/culture (value-expressive and ego-defensive function), and finally the attitude itself (utilitarian function). This provided an opportunity to understand the role and applicability of these four functions of attitudes in the responses of Brazilians.

However, a critical analysis based on the results, the (Katz, 1960) theory is interesting but can only predict and explain the knowledge and utilitarian function of attitudes. Thus, perhaps for future studies, the use of the Theory of Planned Behaviour (Ajzen, 1991) which is less complex and could predict and explain the product's attitudes (utilitarian function) is suggested. The (Katz, 1960) theory is used for the value-expressive and ego-defensive function this is then influenced by the manipulations and does not affect consumer acceptance/purchase intention. Maybe, these two functions have other mechanisms or require different types of experiments to activate the prediction and explain consumer acceptance/purchase intention. Therefore, all four functions of attitudes would have effects in the model start, but only the knowledge and utilitarian function are supported resulting in the overlap with the Theory of Planned Behaviour (Ajzen, 1991).

Suggestively the knowledge function can be measured as a covariate for future studies based on its significance found in the results. Also, the value-expressive and ego-defensive function could influence the consumer acceptance/purchase intention if they are adapted to a healthy lifestyle in the long term when repeated use becomes important for single choices. Thus, if consumers want to follow a plant-based lifestyle they would be important, but this is speculative.

In conclusion, there is no compelling evidence that the Theory of Attitude Function (Katz, 1960) is superior to the Theory of Planned Behaviour (Ajzen, 1991) or the Theory of Reasoned Action (Fishbein & Ajzen, 2011). However, based on the results there are indications that the constructs on (Katz, 1960) theory may influence the other constructs in the model but not entirely. They are influenced without a direct effect on single choices, or they present an effect that was impossible to measure in the way this study was done.

The most relevant novelty about the study of plant-based meat analogues was to conceptualize traditional and imported food in order to understand the acceptance of plant-based meat analogues. Such a concept has not been tested before.

Finally, it was possible to verify that the theories of culture and social norms predicted a part of consumer behavior in the context of plant-based meat analogues but these were unexplainable. Thus, the function theory of attitudes (Katz, 1960) and the theories on culture (D. Briley et al., 2014; J.-B. E. Steenkamp et al., 1999; Triandis, 2002) are useful but should be evaluated with concern for appliance in the food context and the research of consumer behavior for plant-based meat analogues in Brazil.

### 9.3 *Limitations*

The limitations of this research are as follows. Firstly, the data that has been collected and analyzed, deriving from a single research with a limited sample of 199 respondents, in the context of a country with a population of 211 million citizens (World Bank, 2019). Secondly, these results should not be generalized as portraying acceptance of plant-based meat analogues consumption in Brazil. This is because most of the participants in this sample originate from The Rio Grande do Sul, and have a high education level. There is a very strong culture of livestock and meat consumption. In this situation, a dichotomy arises, as there are arguments that individuals with higher levels of education are more prone to the acceptance of plant-based meat analogues (Lea et al., 2006). However, the culture in the state of Rio Grande do Sul incentivizes meat consumption. Thus, these results maybe become generalized only for the state of Rio Grande do Sul. Furthermore, hamburgers are food that could be aligned with the meat-loving culture, as they can be grilled in barbecues. Might be interesting to verify the cultural effects when using as manipulation with unconventional meat such as kangaroos, equids, etc (Cawthorn & Hoffman, 2016). Also, the majority of the survey respondents were female, which is more prone to accept plant-based meat analogues (Lea et al., 2006). Moreover, is important to hypothesize that the results differ if there were more male participants because they could have a higher meat-eating urge (Rothgerber, 2013).

Thirdly, the feedback received by the participants during data collection showed that some of them were unaware or had limited knowledge about plant-based meat analogues. This proves difficult when forming an opinion about them. Also, the survey was conducted during the pandemic of SARS-CoV-2 thus some results could be influenced by lockdown and social distancing effects on consumer behavior (Arora et al., 2020; Sheth, 2020; Zwanka & Buff, 2021). Is it possible to speculate that one of the effects of the pandemic could influence the consumption occasion as individuals when eating on the street or at home are more concerned with the quality of ingredients and hygiene methods in its preparation to guarantee that the consumed food has minimized risks of carrying the virus.

Fourthly, the use of only one question to measure each construct of the functions of attitudes such as the value-expressive, ego-defensive, knowledge, and utilitarian attitudes. This limitation reduces scale's reliability (Hoeppner, Kelly, Urbanoski, & Slaymaker, 2011). Two or more questions per construct provide improved scale reliability. Another option can be the reduction in the number of concepts used in the theoretical model to enable a greater number of questions per construct.

Finally, this research was quantitative using texts and images as manipulation and stimulation. Perhaps, if this same research was conducted qualitatively with a real experiment, where the

participants eat the products. The results may differ, as in real experiments is expected higher level of depth. Thus, an enhanced comparison between meat and plant-based meat analogues acceptance in Brazil.

## 10 Conclusion

In Brazil, the utility of a product is the main deciding factor for a consumer's attitude towards it. Products must be practical in use, while satisfying consumer needs. It was also determined that beliefs are important because they demonstrate previous experience of preparation and consumption of meat products, the traditional feijoada and imported hamburger. This could suggest that Brazilian consumers can be pragmatic, opting for products that have sensory qualities like flavor, appearance, and texture; including prior knowledge of product usage. Less importantly, attitudes related to social norms, values, and identity derived from the culture of meat consumption also influence the acceptance of plant-based meat analogues in Brazil. Thus, is evident that Brazilians have a considerable attachment to meat. Finally, it was seen that imported products have greater appeal to local consumers compared to traditional foods such as feijoada.

Overall, this research provides an unexpected outcome. It was initially anticipated that cultural effects on meat consumption would be more significant than utility and knowledge-related attitudes functions. This demonstrates that there is an impact of meat culture, but it is not as intense, leaving an open space for the introduction of plant-based meat analogues in Brazil to be explored. Furthermore, if utility and knowledge functions contribute to a major part in the consumer decision-making for purchasing a product, further steps can be taken to ask consumers how they would like for plant-based products to reach them, as well as increasing general knowledge of the general public in Brazil. Finally, it would be of great relevance for future research on plant-based meat analogues acceptance in Brazil, that the samples have more male participants and to include respondents with different levels of education and different regions.

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## 12 Appendix I: Questionnaire introduction

Dear participant,

**Welcome** and thanks for your interest in this research!

You are invited to complete a survey, with the aim to understand the consumer choices between meat and plant-based meat analogues.

This research is being conducted by Gabriel Braga Marodin (Master student in Management, Economics and Consumer studies at Wageningen University and Research), to complete his thesis about the consumer acceptance of plant-based meat analogues in Brazil.

Your participation is **voluntary**. If you do not want to participate in this research, or if you want to withdraw later, you can do that anytime.

Your individual data will be analyzed only by the researcher. The overall results will be shared but do not worry, **individual results will remain confidential**.

If you want to learn more about this study, or report complaints, please contact me:

[gabriel.bragamarodin@wur.nl](mailto:gabriel.bragamarodin@wur.nl)

Best Regards,

Gabriel Braga Marodin



Before you start the survey, it is important to read the following points:

- Your participation is voluntary
- Your answers will never be linked to your personal information
- Your answers will remain anonymous

12.1 Appendix II: Message for how to fill the answers in the Likert scale.

Please for each question you should assign an option that show your degree of accordance or discordance (1-Strongly Disagree to 7-Strongly Agree) with each sentence.

This is not a test of what you know, but a test of how you feel in relation to the proposed issues. In this way, there is no correct answer.

Appendix 5: Thank you message and e-mail for prize draw.

Thank you very much for answering this questionnaire. Please write your e-mail address in the field below to apply for a R\$ 100,00 gift card to use at Lojas Americanas.

\* Two gift cards worth R\$ 100,00 will be drawn among all participants who completed the questionnaire.

13 Appendix III: Online Qualtrics questionnaire

**Start of Block: Information Consent**

Information consent  
Estimado participante,

Bem-vindo e obrigado por seu interesse nesta pesquisa!

Você está convidado a preencher este questionário, com o objetivo de compreender as escolhas do consumidor entre produtos de carne animal e análogos de carne produzidos a base de vegetais.

Esta pesquisa está sendo conduzida por Gabriel Braga Marodin (Mestrando em Administração, Economia e Estudos do Consumidor na Universidade de Wageningen), para concluir sua tese sobre a aceitação pelo consumidor de análogos de carne vegetal no Brasil.

Sua participação é voluntária. Se você não quiser participar desta pesquisa, ou se quiser desistir mais tarde, você pode fazer isso a qualquer momento.

Seus dados individuais serão analisados apenas pelo pesquisador. Os resultados gerais serão compartilhados, mas não se preocupe, os resultados individuais permanecerão confidenciais.

Se você quiser saber mais sobre este estudo ou relatar reclamações, entre em contato comigo:  
gabriel.bragamarodin@wur.nl

Cumprimentos,  
Gabriel Braga Marodin

Antes de responder o questionário, é importante ler os seguintes pontos:

- Sua participação é voluntária

- Suas respostas nunca serão vinculadas às suas informações pessoais
- Suas respostas permanecerão anônimas

Sim, Eu concordo. (1)

Não, Eu discordo. (2)

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#### End of Block: Information Consent

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#### Start of Block: Baseline Story All groups

Baseline story all O Brasil tem uma culinária rica, saborosa e diversificada. O consumo de alimentos é altamente dependente de influências culturais, sociais e históricas. Esses diferentes aspectos influenciam a forma como os alimentos são escolhidos e em que ocasiões de consumo são mais adequados.

Os produtos análogos da carne à base de plantas são alimentos que imitam as características naturais da carne animal. Tais como sabor, textura e aparência. São produzidos com vegetais ou leguminosas como soja, ervilhas e outros grãos. As proteínas são extraídas desses vegetais para formar estruturas semelhantes às da carne animal.

#### End of Block: Baseline Story All groups

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#### Start of Block: Condition 1

Con. story 1 Hoje você está na rua na hora do almoço. O tempo está ensolarado e bonito tanto que você decide ficar e almoçar na rua com os amigos. Quando você sente fome, você entra em um restaurante:

Group 1 story No restaurante o seu pedido é uma feijoada feita com carne animal.



Q1A Para cada questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância com cada frase.

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	Discordo Totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Não concordo nem discordo (4)	De certo modo concordo (5)	Concordo (6)	Concordo Totalmente (7)
Escolher este alimento demonstra meus valores. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento é um símbolo de status social. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sempre que consumo este alimento, fico feliz. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento facilita a minha rotina e a organização do meu dia-a-dia. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2A Para esta questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância para a frase.

	Extremament e improvável (1)	Improváv el (2)	Um pouco improváv el (3)	Nem provável nem improváv el (4)	Ligeirament e provável (5)	Provávél (6)	Extremament e provável (7)
Quais são as chances de você comprar este alimento nas próximas 4 semanas ? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**End of Block: Condition 1**

**Start of Block: Condition 2**

Cond. story 1 Hoje você está na rua na hora do almoço. O tempo está ensolarado e bonito tanto que você decide ficar e almoçar na rua com os amigos. Quando você sente fome, você entra em um restaurante:

Group 2 story No restaurante o seu pedido é uma feijoada feita com carne vegetal.



Q1B Para cada questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância com cada frase.

	Discordo Totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Não concordo nem discordo (4)	De certo modo concordo (5)	Concordo (6)	Concordo Totalmente (7)
Escolher este alimento demonstra meus valores. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento é um símbolo de status social. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sempre que consumo este alimento, fico feliz. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento facilita a minha rotina e a organização do meu dia-a-dia. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q1B Para esta questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância para a frase.

	Extremament e improvável (1)	Improvável (2)	Um pouco improvável (3)	Nem provável nem improvável (4)	Ligeirament e provável (5)	Provável (6)	Extremament e provável (7)
Quais são as chances de você comprar este alimento nas próximas 4 semanas ? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**End of Block: Condition 2**

**Start of Block: Condition 3**

Cond. story 1 Hoje você está na rua na hora do almoço. O tempo está ensolarado e bonito tanto que você decide ficar e almoçar na rua com os amigos. Quando você sente fome, você entra em um restaurante:

Group 3 story No restaurante o seu pedido é um hambúrguer feito com carne animal.



Q1C Para cada questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância com cada frase.

	Discordo Totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Não concordo nem discordo (4)	De certo modo concordo (5)	Concordo (6)	Concordo Totalmente (7)
Escolher este alimento demonstra meus valores. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento é um símbolo de status social. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sempre que consumo este alimento, fico feliz. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento facilita a minha rotina e a organização do meu dia-a-dia. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2C Para esta questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância para a frase.

	Extremament e improvável (1)	Improváv el (2)	Um pouco improváv el (3)	Nem provável nem improváv el (4)	Ligeirament e provável (5)	Prováv el (6)	Extremament e provável (7)
Quais são as chances de você comprar este alimento nas próximas 4 semanas ? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**End of Block: Condition 3**

**Start of Block: Condition 4**

Cond. story 1 Hoje você está na rua na hora do almoço. O tempo está ensolarado e bonito tanto que você decide ficar e almoçar na rua com os amigos. Quando você sente fome, você entra em um restaurante:

Group 4 story No restaurante o seu pedido é um hambúrguer feito com carne vegetal.





Q1D Para cada questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância com cada frase.

	Discordo Totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Não concordo nem discordo (4)	De certo modo concordo (5)	Concordo (6)	Concordo Totalmente (7)
Escolher este alimento demonstra meus valores. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento é um símbolo de status social. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sempre que consumo este alimento, fico feliz. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento facilita a minha rotina e a organização do meu dia-a-dia. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2D Para esta questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância para a frase.

	Extremament e improvável (1)	Improvável (2)	Um pouco improvável (3)	Nem provável nem improvável (4)	Ligeirament e provável (5)	Provável (6)	Extremament e provável (7)
Quais são as chances de você comprar este alimento nas próximas 4 semanas ? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**End of Block: Condition 4**

**Start of Block: Condition 5**

Cond. story 2 Hoje você está em casa na hora do jantar. Você se sente feliz e entusiasmado, então decide jantar em casa com sua família. Quando você sente fome, você começa a preparar:

Group 5 story Em sua casa você prepara uma feijoada feita com carne animal.



Q1E Para cada questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância com cada frase.

	Discordo Totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Não concordo nem discordo (4)	De certo modo concordo (5)	Concordo (6)	Concordo Totalmente (7)
Escolher este alimento demonstra meus valores. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento é um símbolo de status social. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sempre que consumo este alimento, fico feliz. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento facilita a minha rotina e a organização do meu dia-a-dia. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2E Para esta questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância para a frase.

	Extremament e improvável (1)	Improváv el (2)	Um pouco improváv el (3)	Nem provável nem improváv el (4)	Ligeirament e provável (5)	Prováv el (6)	Extremament e provável (7)
Quais são as chances de você preparar este alimento nas próximas 4 semanas ? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**End of Block: Condition 5**

**Start of Block: Condition 6**

Cond. story 2 Hoje você está em casa na hora do jantar. Você se sente feliz e entusiasmado, então decide jantar em casa com sua família. Quando você sente fome, você começa a preparar:

Group 6 story Em sua casa você prepara uma feijoada feita com carne vegetal.



Q1F Para cada questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância com cada frase.

	Discordo Totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Não concordo nem discordo (4)	De certo modo concordo (5)	Concordo (6)	Concordo Totalmente (7)
Escolher este alimento demonstra meus valores. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento é um símbolo de status social. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sempre que consumo este alimento, fico feliz. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento facilita a minha rotina e a organização do meu dia-a-dia. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2F Para esta questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância para a frase.

	Extremament e improvável (1)	Improvável (2)	Um pouco improvável (3)	Nem provável nem improvável (4)	Ligeirament e provável (5)	Provável (6)	Extremament e provável (7)
Quais são as chances de você preparar este alimento nas próximas 4 semanas ? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**End of Block: Condition 6**

**Start of Block: Condition 7**

Cond. story 2 Hoje você está em casa na hora do jantar. Você se sente feliz e entusiasmado, então decide jantar em casa com sua família. Quando você sente fome, você começa a preparar:

Group 7 story Em sua casa você prepara um hambúrguer feito com carne animal.



Q1G Para cada questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância com cada frase.

	Discordo Totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Não concordo nem discordo (4)	De certo modo concordo (5)	Concordo (6)	Concordo Totalmente (7)
Escolher este alimento demonstra meus valores. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento é um símbolo de status social. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sempre que consumo este alimento, fico feliz. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento facilita a minha rotina e a organização do meu dia-a-dia. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2G Para esta questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância para a frase.

	Extremament e improvável (1)	Improváv el (2)	Um pouco improváv el (3)	Nem provável nem improváv el (4)	Ligeirament e provável (5)	Prováv el (6)	Extremament e provável (7)
Quais são as chances de você preparar este alimento nas próximas 4 semanas ? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**End of Block: Condition 7**

**Start of Block: Condition 8**

Cond. story 2 Hoje você está em casa na hora do jantar. Você se sente feliz e entusiasmado, então decide jantar em casa com sua família. Quando você sente fome, você começa a preparar:

Group 8 story Em sua casa você prepara um hambúrguer feito com carne vegetal.





Q1H Para cada questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância com cada frase.

	Discordo Totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Não concordo nem discordo (4)	De certo modo concordo (5)	Concordo (6)	Concordo Totalmente (7)
Escolher este alimento demonstra meus valores. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento é um símbolo de status social. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sempre que consumo este alimento, fico feliz. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumir este alimento facilita a minha rotina e a organização do meu dia-a-dia. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2H Para esta questão, você deve marcar uma opção que mostre seu grau de concordância ou discordância para a frase.

	Extremament e improvável (1)	Improváv el (2)	Um pouco improváv el (3)	Nem provável nem improváv el (4)	Ligeirament e provável (5)	Prováv el (6)	Extremament e provável (7)
Quais são as chances de você preparar este alimento nas próximas 4 semanas ? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**End of Block: Condition 8**

**Start of Block: Personal Information**

Q3 Gênero:

- Masculino (1)
- Feminino (2)
- Outro (3)



Q4 Idade: \_\_\_\_\_

---

Q5 Nível de escolaridade:

- Ensino fundamental (1)
- Ensino médio (2)
- Ensino técnico (3)
- Ensino superior (4)
- Outro (5)

---

Q6 Cidade \_\_\_\_\_

Q7 Estado: \_\_\_\_\_

**End of Block: Personal Information**

---

**Start of Block: Meat consumption behaviour**

Q8 Em média, quantas vezes por semana você come carne? Incluindo café da manhã, almoço, jantar e lanches. Se mais de 14 vezes por semana, por favor selecione 14.

1 (1)

2 (2)

3 (3)

4 (4)

5 (5)

6 (6)

7 (7)

8 (8)

8 (9)

10 (10)

11 (11)

12 (12)

13 (13)

14 (14)

---

Q9 Qual das alternativas a seguir se aplica a você, no que diz respeito à frequência do consumo de carne?

- Eu sou vegano / vegetariano (não como carne) (1)
- Eu sou um flexitário (eu deliberadamente diminuí a frequência do meu consumo de carne) (2)
- Eu sou um consumidor de carne sem restrições (3)



E-mail Muito obrigado por responder este questionário. Por favor escreva seu endereço de e-mail no campo abaixo para concorrer a um vale-presente no valor de R\$ 100,00 para usar nas Lojas Americanas.

\*Serão sorteados dois vales-presentes no valor de R\$ 100,00 entre todos participantes que completaram o questionário.

---

**End of Block: Meat consumption behaviour**

---

## 14 Appendix IV: Syntax SPSS

DATA TREATMENT FOR HYPOTHESES 2, 3, 4.

```
COMPUTE ValueEx_MeatFeijo=sum(Q1A_1, Q1E_1).
```

```
COMPUTE EgoDef_MeatFeijo=sum(Q1A_2, Q1E_2).
```

```
COMPUTE Util_MeatFeijo=sum(Q1A_3, Q1E_3).
```

```
COMPUTE Knowledge_MeatFeijo=sum(Q1A_4, Q1E_4).
```

```
EXECUTE.
```

```
COMPUTE ValueEx_PlantFeijo=sum(Q1B_1, Q1F_1).
```

```
COMPUTE EgoDef_PlantFeijo=sum(Q1B_2, Q1F_2).
```

```
COMPUTE Util_PlantFeijo=sum(Q1B_3, Q1F_3).
```

```
COMPUTE Knowledge_PlantFeijo=sum(Q1B_4, Q1F_4).
```

```
EXECUTE.
```

```
COMPUTE ValueEx_MeatBurger=sum(Q1C_1, Q1G_1).
```

```
COMPUTE EgoDeH_MeatBurger=sum(Q1C_2, Q1G_2).
```

```
COMPUTE Util_MeatBurger=sum(Q1C_3, Q1G_3).
```

```
COMPUTE KnowledgG_MeatBurger=sum(Q1C_4, Q1G_4).
```

```
EXECUTE.
```

```
COMPUTE ValueEx_PlantBurger=sum(Q1D_1, Q1H_1).
```

```
COMPUTE EgoDeH_PlantBurger=sum(Q1D_2, Q1H_2).
```

```
COMPUTE Util_PlantBurger=sum(Q1D_3, Q1H_3).
```

```
COMPUTE KnowledgG_PlantBurger=sum(Q1D_4, Q1H_4).
```

```
EXECUTE.
```

```
INTENTIONSxBETWEEN CONDITIONS
```

```
RECODE FL_19_DO_FL_16 (SYSMIS=0) (1=1) INTO Betweencondition.
```

```
EXECUTE.
```

```
REPEATED MEASURES ANALYSIS OF VARIANCE FOR HYPOTHESES 2, 3,4
```

```
GLM ValueEx_MeatFeijo ValueEx_MeatBurger ValueEx_PlantFeijo ValueEx_PlantBurger BY  
BetweenCondition
```

```
/WSFACTOR=meat_plant 2 Polynomial Tradi_Import 2 Polynomial
```

```
/METHOD=SSTYPE(3)
```

```
/PLOT=PROFILE(meat_plant*Tradi_Import Tradi_Import*meat_plant) TYPE=LINE ERRORBAR=NO  
MEANREFERENCE=NO YAXIS=AUTO
```

```
/EMMEANS=TABLES(meat_plant) COMPARE ADJ(LSD)
```

```
/EMMEANS=TABLES(Tradi_Import) COMPARE ADJ(LSD)
```

```
/PRINT=ETASQ
```

```
/CRITERIA=ALPHA(.05)
```

```
/WSDESIGN=meat_plant Tradi_Import meat_plant*Tradi_Import
```

```
/DESIGN=BetweenCondition.
```

```
GLM EgoDef_MeatFeijo EgoDeH_MeatBurger EgoDef_PlantFeijo EgoDeH_PlantBurger BY  
BetweenCondition
```

```
/WSFACTOR=meat_plant 2 Polynomial Tradi_Import 2 Polynomial
```

```
/METHOD=SSTYPE(3)
```

```
/PLOT=PROFILE(meat_plant*Tradi_Import Tradi_Import*meat_plant) TYPE=LINE ERRORBAR=NO  
MEANREFERENCE=NO YAXIS=AUTO
```

```
/EMMEANS=TABLES(meat_plant) COMPARE ADJ(LSD)
```

```
/EMMEANS=TABLES(Tradi_Import) COMPARE ADJ(LSD)
```

```
/PRINT=ETASQ
```

```
/CRITERIA=ALPHA(.05)
```

```
/WSDESIGN=meat_plant Tradi_Import meat_plant*Tradi_Import
```

/DESIGN=BetweenCondition.

```
GLM Util_MeatFeijo Util_MeatBurger Util_PlantFeijo Util_PlantBurger BY BetweenCondition
/WSFACTOR=meat_plant 2 Polynomial Tradi_Import 2 Polynomial
/METHOD=SSTYPE(3)
/PLOT=PROFILE(meat_plant*Tradi_Import Tradi_Import*meat_plant) TYPE=LINE ERRORBAR=NO
MEANREFERENCE=NO YAXIS=AUTO
/EMMEANS=TABLES(meat_plant) COMPARE ADJ(LSD)
/EMMEANS=TABLES(Tradi_Import) COMPARE ADJ(LSD)
/PRINT=ETASQ
/CRITERIA=ALPHA(.05)
/WSDESIGN=meat_plant Tradi_Import meat_plant*Tradi_Import
/DESIGN=BetweenCondition.
```

GLM Knowledge\_MeatFeijo KnowledgG\_MeatBurger Knowledge\_PlantFeijo KnowledgG\_PlantBurger  
BY

```
BetweenCondition
/WSFACTOR=meat_plant 2 Polynomial Tradi_Import 2 Polynomial
/METHOD=SSTYPE(3)
/PLOT=PROFILE(meat_plant*Tradi_Import Tradi_Import*meat_plant) TYPE=LINE ERRORBAR=NO
MEANREFERENCE=NO YAXIS=AUTO
/EMMEANS=TABLES(meat_plant) COMPARE ADJ(LSD)
/EMMEANS=TABLES(Tradi_Import) COMPARE ADJ(LSD)
/PRINT=ETASQ
/CRITERIA=ALPHA(.05)
/WSDESIGN=meat_plant Tradi_Import meat_plant*Tradi_Import
/DESIGN=BetweenCondition.
```

MEANS AND STANDARD DEVIATIONS FOR ALL THE PRODUCTS/MATERIAL/CONSUMPTION OCASSION

FILE='C:\Users\User\Documents\Tese Meat Replacers Brazil\Data Analysis\Aceitação do  
consumidor para produtos de carne vegetal no Brasil\_April 22, 2021\_05.56.sav'.

DATASET NAME DataSet1 WINDOW=FRONT.

DATASET ACTIVATE DataSet1.

ONEWAY ValueEx\_MeatFeijo EgoDef\_MeatFeijo Util\_MeatFeijo Knowledge\_MeatFeijo  
ValueEx\_PlantFeijo

EgoDef\_PlantFeijo Util\_PlantFeijo Knowledge\_PlantFeijo ValueEx\_MeatBurger  
EgoDeH\_MeatBurger

Util\_MeatBurger KnowledgG\_MeatBurger ValueEx\_PlantBurger EgoDeH\_PlantBurger  
Util\_PlantBurger

KnowledgG\_PlantBurger BY BetweenCondition

/STATISTICS DESCRIPTIVES HOMOGENEITY

/MISSING ANALYSIS.

DATA TREATMENT FOR TESTING HYPOTHESES 1, 5, 6.

VARSTOCASES

/ID=id

```

/MAKE VALUEEX FROM ValueEx_MeatFeijo ValueEx_PlantFeijo ValueEx_MeatBurger
ValueEx_PlantBurger
/MAKE EGODEF FROM EgoDef_MeatFeijo EgoDef_PlantFeijo EgoDeH_MeatBurger
EgoDeH_PlantBurger
/MAKE KNOWLEDGE FROM Knowledge_MeatFeijo Knowledge_PlantFeijo KnowledgG_MeatBurger
KnowledgG_PlantBurger
/MAKE UTIL FROM Util_MeatFeijo Util_PlantFeijo Util_MeatBurger Util_PlantBurger
/MAKE INTENTION FROM Inten_MeatFeijo Inten_PlantFeijo Inten_MeatBurger Inten_PlantBurger
/INDEX=Index1(4)
/KEEP=Q3 Q4 Q5 Q6 Q7 Q8 Q9 ContrastCoding
/NULL=KEEP.

```

#### VALUE LABELS FOR THE PRODUCTS/MATERIALS

Value label index1 1 'Feijoada Meat' 2 'Burger meat' 3 'Feijoada plant' 4 'burger plant'.  
EXECUTE.

#### HYPOTHESIS TESTING 5, 6. HIERARCHICAL LINEAR MODEL

```

MIXED INTENTION BY ContrastCoding WITH VALUEEXP EGODEF UTILF KNOWF
/CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1) SINGULAR(0.000000000001)
HCONVERGE(0,
  ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
/FIXED=ContrastCoding VALUEEXP EGODEF UTILF KNOWF ContrastCoding*VALUEEXP
ContrastCoding*EGODEF
  ContrastCoding*UTILF ContrastCoding*KNOWF | SSTYPE(3)
/METHOD=REML
/REPEATED=Index1 | SUBJECT(id) COVTYPE(DIAG)
/EMMEANS=TABLES(ContrastCoding) .

```

#### HYPOTHESIS TESTING 1. MULTIPLE LINEAR REGRESSION

```

DATASET NAME DataSet1 WINDOW=FRONT.
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA COLLIN TOL
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT INTENTION
/METHOD=ENTER VALUEEXP EGODEF UTILF KNOWF.

```

#### DEMOGRAPHICS

```

FREQUENCIES VARIABLES=Q3 Q4 Q5 Q6 Q7 Q8 Q9
/STATISTICS=MEAN MEDIAN MODE
/PIECHART PERCENT
/ORDER=ANALYSIS.

```