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Concerns, attitudes, and opinions of meat buyers in Garanhuns, Pernambuco, Brazil

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ABSTRACT - With the objective of identifying the concerns, attitudes, and opinions of meat buyers and their relationship with their choice of place of purchase (supermarkets, free fair, or butchers), 381 consumers in the city of Garanhuns, Brazil, were interviewed. Data analysis was performed using descriptive statistics and discriminant analysis, complemented by stepwise regression, Wilks' Lambda test, and Fisher's linear test. Most of the respondents expressed that inadequate commercialization of meat occurred in free fairs, and the lack of hygiene and the fact that meat was exposed in the environment without refrigeration were the main preoccupations. They also reported that meat consumption without inspection could lead to disease transmission, with pork being considered the most dangerous. Based on the theory of planned behavior, buyers agreed that their attitudes toward the purchase of meat (concern with food safety, price, animal welfare, environment, and slave labor) influenced their purchasing decisions. Regarding the subjective norms, the results indicated that purchase intention could be modulated by the opinion and judgment that other people exercise on the buyer's choice decision. Regarding perceived control, the respondents said that they were confused at the time of purchase and got irritated after making a purchase that did not satisfy their desires. The factors that differentiated consumers who prefer to buy meat in supermarkets from those who prefer butchers and free fairs are mainly the price of the product, custom/tradition, customer service, and hygiene of the establishment. Buyers who have a lower level of schooling and live in rural areas also tended to buy meat in free fairs.

Keywords: behavior, meat, meat quality, traceability

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1. Introduction

Meat marketers face challenges due to the expectations and concerns of consumers about food safety. These concerns have historically increased with the reporting of incidents involving microbial contaminants and chemical residues in products. However, marketing opportunities arise with the increase in the demands of consumers, who seek variety and quality in the products offered in the supermarkets and free fairs.

In recent years, the supermarket sector in Brazil has sought to meet the consumer demands through effective monitoring of the supply chain. Due to its organizational structure, some supermarket chains do not allow the marketing of meat from deforestation areas and require that the production processes be free from slave and child labor (FGV, 2011).

Free fairs are traditional markets that offer food products through free competition of manufacturers. This form of marketing is an opportunity for the rural producer to add value to the product and retain consumers through direct communication (Detre et al., 2011). This meat trade is carried out informally, in poor sanitary conditions and without sanitary inspection, putting the health of the population at risk (Diniz et al., 2013; Dill et al., 2014a). Hygiene problems affecting meat quality are very common in the Northeast region of Brazil, in the Agreste region of Pernambuco, particularly in the city of Garanhuns, where the meat trade faces several difficulties, mainly in free fairs. These difficulties are related to the lack of hygiene in the slaughter, processing, storage, and marketing of meat (Diniz et al., 2013; Silva Filho et al., 2018).

Therefore, it is important to understand the factors that modulate consumer behavior to develop educational programs that aim to make buyers and sellers aware of the relevance of hygienic and sanitary conditions in meat sale. The evaluation of products by consumers is based on the detection and hierarchy of quality indicators that are represented by both intrinsic and extrinsic attributes (Poulsen et al., 1996; Dill et al., 2014b). These factors are present before, during, and after the purchase of a product, and it is important to analyze all stages of the process. According to the theory of planned behavior (TPB; Ajzen, 1991), human behavior stems from behavioral intention, which is the result of assessments of attitudes toward behavior already performed, subjective norms, and the control that the individual has over themselves and the surrounding environment.

The objective of this study was to analyze the behavior of meat buyers in the city of Garanhuns, Pernambuco, to identify the attitudes, concerns, and opinions regarding the purchase of meat, and their relationship with the choice of place of purchase (supermarkets, butchers, and free fairs) among the residents of this area. Data interpretation had to be carried out with caution, as the information contained in this research does not characterize the marketing of meat from different regions of Brazil.

2. Material and Methods

Through the literature review, a preliminary questionnaire was developed with objective and subjective questions based on the TPB (Ajzen, 1991) and research related to consumer behavior (Yeung and Morris, 2001; McCarthy et al., 2003; Verbeke and Vackier, 2005; Barcellos, 2007; Verbeke et al., 2010; Barcellos et al., 2012; Diniz et al., 2013; Dill et al., 2014b). The questionnaire went through a pre-test with 10 specialists in the areas of consumer behavior, sanitation, and meat inspection and marketing, and 10 meat buyers.

After preparing the final questionnaire, 381 meat buyers were randomly chosen to participate in the survey, considering gender, education (Table 1), and sample size. The sample was calculated using the technique "sampling for an estimate of a proportion of the population", according to the following equation (Anderson et al., 2003):

$$n = \frac{z^2 pq}{\varepsilon^2} \quad (1)$$

in which n = sample, z = confidence level, p = proportion of a characteristic of the population to be sampled, $q = (1 - p)$, and ε = margin of error. A confidence level of 95% and an error margin of 5% were used. The city of Garanhuns has 129,408 residents, of which 70,652 are 25 years of age or over.

The interviews were conducted over two days in each of the three free fairs, which were organized weekly in the neighborhoods Boa Vista (Saturday), Heliópolis (Thursday), and São José (Saturday). The interviews were also conducted one day in the butcher shop located adjacent to the free fair in the Boa Vista neighborhood and two days in each of the three supermarkets in the São José, Centro,

and Heliópolis neighborhoods, totaling 13 collection days during April–June, 2016. This research was approved by the local Research Committee. The interviews were conducted anonymously, and there are no conflicts of interest associated with this publication. The authors are responsible for the information presented in this research.

In the first phase, a descriptive statistical analysis was performed to characterize meat buyers based on socioeconomic and cultural characteristics such as age, gender, number of children, schooling, family income, place of residence, newspaper and magazine reading habits, and internet access.

Data on the degree of knowledge of meat buyers regarding zoonoses transmission as well as the intrinsic and extrinsic attributes, purchasing preferences and preferences related to the place of purchase, and types of meat were qualitatively analyzed. To assess the opinions, attitudes, and concerns of meat buyers, a five-point Likert scale was used (Table 2).

In the second phase, two distinct groups of buyers were formed, considering the places of purchase. The first group, the SUPER group, consisted of respondents who preferred supermarkets, and the second group, the FLAG group, consisted of respondents who preferred butcher shops and free fairs. A discriminant analysis (DA) was conducted to evaluate the possibility of characterizing the different types of behavior of the buyers in relation to the place of purchase based on values of their characteristics, attitudes, and preferences.

The DA is used to classify objects, maximize the distribution matrix of the data between classes, and minimize the variability between classes (Mingoti, 2007). This technique splits sample values into two

Table 1 - Gender and educational characteristics of the study sample

Gender	Educational characteristic	N
Men	No education and incomplete elementary school	99
	Complete elementary school and incomplete high school	22
	Complete high school and incomplete higher education	35
	Complete higher education	14
Total (1)		170
Women	No education and incomplete elementary school	117
	Complete elementary school and incomplete high school	24
	Complete high school and incomplete higher education	48
	Complete higher education	22
Total (2)		211
Total (1 + 2)		381

Source: based on data from IBGE (2010).

Table 2 - Questions based on the theory of planned behavior

Question
Attitudes toward behavior
Do you worry about food safety?
Do you care about price?
Do you care about animal welfare?
Do you care about the environment?
Do you care about slave labor?
Subjective rules
What does your meat choice say about you to others?
Do you feel that your meat purchasing is judged by others?
Perceived control
Do you feel a little confused when choosing meat?
Is it annoying to make an inappropriate purchase of meat?
Do you care about the health risks (zoonosis) of eating meat?

or more groups in an exploratory phase. In this procedure, from the previously defined groups, the characteristics of the samples that can help in class discrimination are investigated (Landim, 2011).

In addition, DA also indicates, in an orderly way, the characteristics and preferences of buyers that had more significance in the definition of classes (places of purchase). In the stepwise forward estimation process, the independent metric variables (i.e., the characteristic values and preferences of the buyers) are inserted according to the degree of discrimination for the behavior of the dependent variable (i.e., the places of purchase).

The data were analyzed using principal component analysis and then, based on the number of components defined by the Kaiser methods, the scree plot was applied to the DA to identify the variables that discriminate the groups based on their characteristics, from the Wilks' lambda test and Fischer's linear test ($P<0.05$). Both analyses were interpreted to highlight the states that stand out in the subject of buyers' preferences. The analyses allowed us to establish mathematical functions, called rules of classification or discrimination (Mingoti, 2007), which use the information of the characteristics and preferences of the buyers as criteria to allocate new objects in classes.

With the most discriminating variables (places of purchase: supermarkets and free fairs) for the formation of groups, discriminant functions were identified. The general discriminant function is represented by the following linear equation (Maroco, 2003):

$$Zn = \alpha + \beta 1X1 + \beta 2 + X2 + \cdots + \beta nXn, \quad (2)$$

in which Z is the dependent variable, α is the intercept, Xi are the explanatory variables, and βi are the discriminant coefficients for each explanatory variable. The linear discriminant function of Fischer is given by equation 3:

$$Zn = \alpha + \omega 1X1 + \omega 2 + X2 + \cdots + \omega nXn, \quad (3)$$

in which ωi represents the vector of weight/loads of the variables for the discriminant functions and are estimated so that the variability of the scores of the discriminant function is maximal between groups and minimum within groups (Maroco, 2003).

It is important to note that this discriminating function is different from Fischer's discriminating function. While the first is used to facilitate the interpretation of the parameters of the explanatory variables, Fischer's linear discriminant function is used to classify observations in the groups. The calculations for this analysis were performed using R 3.0.1 (R Core Team, 2014) and the Statistical Package for the Social Sciences 16 (SPSS UK Ltd, Chersey, UK).

3. Results

In the first phase, we found that most of the respondents were women (55.38%), from 41 to 60 years old. Assessment of family composition revealed that 86% of the respondents had children, of which 41% had 1 to 2 children (Table 3). The majority of respondents did not have any education or had incomplete elementary education, lived mainly in the urban area, did not read newspapers or magazines weekly, and did not usually access the Internet to seek information. Most of these meat buyers had a family income up to level 2 of the national minimum wage (Table 3).

As for the places where consumers bought meat, supermarkets were the most preferred places (43.8%), followed by butcher shops (32.8%) and free fairs (23.4%). The main reasons that led consumers to choose a particular place to buy meat were related to customs (41.9%), sanitation (37.5%), price (12.4%), and service (8.2%).

Among the different types of meat, the most bought in the city of Garanhuns was beef (68%), followed by chicken (24%), pork (5%), goat/sheep (2%), and fish (1%). Beef was the preferred meat of the respondents (59%), followed by chicken (23%), pork (10%), fish (5%), and goat/sheep (3%).

With regard to knowledge of buyers on the extrinsic and intrinsic characteristics of meat, 87.1% stated that they observed some characteristics of the meat at the time of purchase, the most cited attribute

being meat color (32.3%), followed by smell (2.62%), shelf life (2.1%), and sanitation (1.8%). With regard to knowledge of buyers on meat inspection or quality control processes, 76% reported that the meat they consumed was inspected or underwent a quality control process, 18% claimed not to know, and 6% admitted that the meat they purchased was not inspected and did not go through quality control.

With regard to consuming unregulated meat, 87% of the respondents in the present study claimed to know the risks and had the understanding that consuming unregulated meat could result in the transmission of diseases, whereas 13% did not believe this was the case, most likely due to a lack of access to information. It was observed that 71% of the respondents considered the marketing of meat in free fairs to be poor, 22% considered the marketing of meat in butcher shops to be poor, and only 3% considered the marketing of meat in supermarkets to be poor.

After the analysis of the attitudes of respondents toward meat purchasing, most was concerned about food safety, meat prices, ethical issues related to animal welfare, environmental issues, and slave labor (Table 4). The analysis of the data showed a bias in the opinions of meat buyers. While 178 of the respondents disagreed with the notion that third parties influenced their meat choices, 157 agreed. Similarly, 185 disagreed that others judged their meat purchases; however, 148 agreed with the notion (Table 4).

When analyzing their purchase decisions, the majority of the respondents considered it to be irritating if they made the wrong choice when buying meat (which, for some reason, it does not meet their expectations, whether in relation to its taste, color, smell, or in relation to food safety). Furthermore, 163 respondents reported that they were often confused when choosing meat to purchase. On the other hand, 161 respondents experienced little uncertainty when choosing meat.

Table 3 - Socioeconomic and cultural variables

Variable	Unit of measurement	%
Gender	Men	44.62
	Women	55.38
Number of children	0 children	14
	1 to 2 children	41
	3 to 4 children	26
	More than 4 children	19
Age group	21-40 years	31.5
	41-60 years	39.4
	61-83 years	29.1
Schooling	Uneducated or elementary school not completed	57
	Elementary school completed and high school not completed	12
	High school completed, no higher education, or higher education not completed	22
	Higher education completed	9
Family income	Less than 1 national minimum wage	15
	1 to 2 national minimum wages	66
	3 to 4 national minimum wages	13
	More than 4 national minimum wages	6
Place of residence	Rural area	23.62
	Urban area	76.37
Read newspapers/magazines weekly	Yes	25.99
	No	74.01
Internet access for information	Yes	37.79
	No	62.21

In the second phase, consumers were grouped into two groups, while considering the preference of the place of purchase: the SUPER group (consumers who chose to buy meat from supermarkets, n = 167) and the FLAG group (consumers who preferred to buy meat from free fairs and butchers, n = 214). From the discriminant analysis, it was observed that the buyers were correctly associated with their respective groups in 77.2% of the cases, indicating a high degree of reliability in the determination of the two groups; 74.9% of the buyers belonging to the SUPER group were correctly classified, and 79% of the buyers of the FLAG group were correctly classified.

The results revealed that the variables that have the greatest discrimination in the formation of the two groups of buyers are related to the following: reasons for choosing a particular place of purchase (PP); perceptions regarding sanitation at the place of purchase (SP); adequacy of forms of commercialization in supermarkets (CS); adequacy of commercial terms of buyer in butchers and free fairs (AB); level of schooling (LS); and place of residence (PR) (Table 5).

While analyzing the differences between the two groups of buyers regarding the reasons for choosing a particular place of purchase (PP), it was found that those who chose supermarkets (SUPER group) considered sanitation to be the most important feature, followed by tradition/custom and price. For those who bought meat in the butcher shops and free fairs (FLAG group), the main reasons, in order of importance, were tradition/custom, sanitation, and price of the meat (Table 6).

Table 4 - Perception of meat buyers

	TD (1)	D (2)	ND/NA (3)	A (4)	CA (5)	NA	M	SD
Attitudes toward behavior								
Do you worry about food safety?	0	30	9	317	24	1	3.88	0.62
Do you care about the price?	7	96	17	227	34	0	3.49	1.02
Do you care about animal welfare?	3	79	15	263	17	4	3.56	0.90
Do you care about the environment?	0	63	14	276	27	1	3.70	0.83
Do you care about slave labor?	2	78	10	250	39	2	3.65	0.94
Subjective rules								
What does your meat choice say about you to others?	8	178	19	157	2	17	2.91	1.01
Do you feel that your meat purchasing is judged by others?	14	185	20	148	2	11	2.83	1.03
Perceived control								
Do you feel a bit confused when choosing meat?	20	161	25	163	12	0	2.96	1.09
Is it annoying to choose the wrong meat?	4	44	7	269	55	2	3.86	0.84
Do you care about the health risks (zoonosis) associated with meat?	3	22	5	295	56	0	3.99	0.68

Likert scale (5 points): TD - totally disagree (1); D - disagrees (2); ND/NA - does not disagree and does not agree (3); A - agrees (4); CA - completely agrees (5); NA - no answer; M - mean; SD - standard deviation.

Table 5 - Discriminant variables in the formation of groups of buyers

Group	SUPER Buyers - N (%)	FLAG Buyers - N (%)	Total N (%)
SUPER	125 (74.9%)	42 (25.1%)	167 (100%)
Variable	Tolerance	Fischer's test	Wilks' lambda
PP	0.932	0.000	0.791
SP	0.985	0.000	0.729
CS	0.932	0.002	0.707
AB	0.950	0.000	0.713
LS	0.973	0.002	0.706
PR	0.948	0.027	0.698

SUPER - respondents who preferred supermarkets; FLAG - respondents who preferred butcher shops and free fairs; PP - place of purchase; SP - sanitation at the place of purchase; CS - adequacy of forms of commercialization in supermarkets; AB - adequacy of commercial terms of buyer in butchers and free fairs; LS - level of schooling; PR - place of residence.

Table 6 - Profile of buyers of each group

Variable	Group	Answer				
PP		Price	Tradition/custom	Attendance	Sanitation	
	SUPER	7.18%	23.95%	4.79%	64.07%	
	FLAG	16.35%	56.07%	10.74%	16.82%	
SP		Great	Good	Regular	Bad	Poor
	SUPER	17.96%	63.47%	17.36%	0.6%	0.6%
	FLAG	9.34%	50.93%	28.03%	6.07%	5.61%
CS		Yes	Partially	No		
	SUPER	84.43%	14.97%	0.6%		
	FLAG	79.9%	14.95%	5.14%		
AB		Yes	Partially	No		
	SUPER	30.53%	39.52%	29.94%		
	FLAG	53.27%	31.31%	15.42%		
LS		Uneducated	Elementary school	High school	Higher education	
	SUPER	42.51%	13.17%	28.74%	15.56%	
	FLAG	67.76%	10.74%	16.83%	4.67%	
PR		Rural area	Urban area			
	SUPER	14.97%	85.03%			
	FLAG	30.37%	69.63%			

SUPER - respondents who preferred supermarkets; FLAG - respondents who preferred butcher shops and free fairs; PP - place of purchase; SP - sanitation at the place of purchase; CS - adequacy of forms of commercialization in supermarkets; AB - adequacy of commercial terms of buyer in butchers and free fairs; LS - level of schooling; PR - place of residence.

When comparing the responses of the different groups of buyers regarding their perceptions about sanitation at the place of purchase (SP), it was found that the SUPER group was more satisfied with this aspect, whereas buyers in the FLAG group considered sanitation in free fairs and butcher shops to be regular (28.03%), bad (6.07%), or poor (5.61%) (Table 6).

In the SUPER group, 84.43% stated that the manner in which meat is marketed in supermarkets (CS) was appropriate. In the FLAG group, 53.27% of the buyers said that the manner in which sales take place in butcher shops and free fairs (AB) was appropriate, and for 31.31%, it was partially adequate. Residence (PR) was also related to the choice of place of purchase of meat. The proportion of FLAG group residents residing in rural areas was higher than that of the SUPER group (Table 6). Higher levels of schooling were identified in the individuals belonging to the SUPER group compared with those in the FLAG group (Table 6).

4. Discussion

According to Hoffmann (2018), the number of nuclear families are increasing in Brazil. This may be an opportunity to develop new products for specific groups of consumers such as the marketing of small portions that meet the needs of this new family composition (Dill et al., 2014a). With regard to the level of schooling of the respondents, stratified according to Instituto Brasileiro de Geografia e Estatística (IBGE, 2010; Brisola and Castro, 2005), it was observed that the lower-income classes (low education level) did not care about the sanitary inspection of the product at the time of purchase. Henchion et al. (2017) identified that information on the label received higher grades of concern; in general, higher-income classes were more preoccupied with this information on meat choice. Boito et al. (2021) found a constant and increased preoccupation with meat quality when evaluating the Brazilian consumer profile.

Lino et al. (2009) reported that the main factor influencing the purchase decision of consumers buying meat in the public markets of the city of Jaboatão dos Guararapes, located in the metropolitan region of Recife, Pernambuco, was price, followed by convenience, custom, and reliability of the product. Often, meat was no longer consumed due to the buyer's income, lack of availability and practicality of the food, and/or perceived health risks (Dill et al., 2014b). This concern about health risks may be associated with recent major scandals involving dubious suppliers who misrepresented their products to consumers (Boito et al., 2021).

The results of a survey carried out in the city of São Luís, Maranhão, on the knowledge of inspection suggested that the advantages of inspected meat were the guarantee of food safety, lower health risk, and flavor quality. The survey also found that the disadvantage of the inspected meat, compared with the non-inspected meat, was the higher price; however, even with the increase in price, most of the respondents reported that they were willing to pay more for inspected products (Lopes et al., 2014).

Similarly, Lino et al. (2009) found that most meat consumers in their study understood very little about the diseases transmitted by meat consumption. They indicated that the consumption of pork is more likely to transmit diseases, followed by beef and chicken. In general, Brazilian consumers consider pork to be bad for one's health, dangerous, and to contain a considerable amount of fat that causes an increase in cholesterol levels. When a consumer remarks that pork is bad and dangerous, he or she may be referring to parasitic diseases that can be transmitted through the consumption of meat without proper regulation and monitoring. Although pork may be considered by some as "fatty", the health risks from pork fat have diminished since the time of the "fat pig". With genetic improvement, the fat content in swine has been found to be decreased (Dill et al., 2014b). Negative perceptions regarding pork come from a time when production and inspection were not carried out efficiently, and this type of meat production is not yet totally overcome in some rural areas in Brazil. The aversion to pork can be also related to cultural and religious aspects of a part of the population (Font-i-Furnols and Guerrero, 2014). It is worth mentioning that production and sanitary inspection systems have made pork a product with a low health risk (Kich et al., 2019).

In the case of beef, one possible explanation for its indication as detrimental to health is its association with the development of cardiovascular diseases (McAfee et al., 2010) and, more recently, the risk of cancer, in addition to the transmission of zoonoses, such as brucellosis and tuberculosis. Despite knowing that disease transmission can occur through the consumption of unregulated meat, the respondents were unable to cite what these diseases were in 60% of the cases.

Among the main reasons for the negative opinion regarding free fairs were poor sanitation, exposure of meat to the environment, lack of refrigeration, and inappropriate care of the products. These findings agree with the results of a study by Diniz et al. (2013) in the Garanhuns microregion in Pernambuco. The authors found evidence of poor sanitary conditions in the marketing of meat, from slaughter to the handling of the product in the marketplace. According to Silva Filho et al. (2018), free-fair trades located in the city of Garanhuns present conditions precarious to the storing and cooling of the meat, demonstrating that they are at odds with Resolution of the Collegiate Board - RDC No. 275 of 2002, from the Ministry of Health of Brazil, which validates the technical regulation of hygienic and sanitary conditions and Good Manufacturing Practices - GMP (Brasil, 2002). Free-fair trades are also at odds with Ordinance No. 304 of 1996, of the Ministry of Agriculture, Livestock and Supply (Brasil, 1996), which establishes criteria for meat distribution and marketing activities, aiming at consumer health (Silva Filho et al., 2018).

McCarthy et al. (2003) and Maysonnave et al. (2014) accounted that both attitudes and subjective norms influenced the intention to buy meat, but attitude was the most significant construct. The determinant attributes in the choice were related to health, satisfaction, pleasure in consuming meat, food safety, and, in fewer cases, price and concerns about animal welfare and the environment (McCarthy et al., 2003; Tatum, 2015).

In a survey conducted by the European Union, it was found that most consumers believed that improvements in animal welfare were needed (Ingenbleek and Immink, 2011), admitting to buying

fewer animal products because of the way they were manufactured. More recently, the actions of vegetarian and vegan consumer groups in the European Union and around the world have influenced meat consumption habits, especially beef, among younger consumers (Grunert, 2006; Troy and Kerry, 2010; Henchion et al., 2014).

Verbeke et al. (2010) identified two groups of consumers with concerns about the ethical aspects of meat production and marketing: "environmentally conscious" citizens, who make efforts in their consumption to minimize environmental damage, and citizens who are "aware of animal welfare". Ingenbleek and Immink (2011) pointed out that consumers consider animal welfare in their purchasing decisions, but only after other needs are met. Their primary concerns were availability of the product, product safety, and product quality, in that order.

In this context, it is possible to emphasize that even if meat buyers consider issues related to animal welfare and the environment important, they do not automatically opt for a product that has been produced in accordance with such requirements. Therefore, it is necessary that the most basic consumption needs, such as food safety (attribute of highest score found in the research), are met first, so that the purchase decision could be directed to the ethical aspects of production and consumption including the environment, slave labor, and animal welfare.

Subjective norms represent the social pressure behind the purchase and are related to perceptions of consumers of the opinions of third parties regarding the purchase to be made (Barcellos, 2007). These results indicate that buying intent can be modulated by social pressure (subjective norms) and depend on how buyers perceive the opinion and judgment that other people have about their decisions and their own identity. In this sense, buyers are not only concerned about food safety and quality but also with social issues associated with the purchase of meat.

The TPB reveals that perceived control over behavior is related to the individual's perception of their degree of control over certain situations. When analyzing their purchase decisions, the majority of respondents found it irritating to have made the wrong choice when buying meat (which, for some reason, did not meet their expectations, whether in relation to its taste, color, smell, or food safety). The frustration of the respondents over the wrong purchase can be a determinant in the formation of negative attitudes regarding the type of meat or place of purchase, thus becoming a limiting factor for the consumer to repeat this purchase. Past studies have identified that favorable attitudes and perceived high control over the product cause the consumer to behave positively with regard to the intention to repeat the purchase (Verbeke and Vackier, 2005; Realini et al., 2014).

Among the respondents, 163 reported that they are often confused when purchasing meat. One method used by the Brazilian meat industry to minimize this confusion is the use of trademarks, which imparts quality and attributes of desire to a product (Spinelli et al., 2015; O'Quinn et al., 2016). On the other hand, the uncertainty when choosing meat reveals that a significant number of the respondents believed they had the ability to understand and find quality attributes that meet their needs, and this comes from the experience that meat consumers develop over the years (Banović et al., 2009).

For buyers who are confused about buying meat, traceability and certification can guide the purchase decision through information on the origin of the product, expiration date, breed, age of animal, fat content, and storage temperature (Brandão et al., 2015; Gomes et al., 2017). Spence et al. (2018) reported that improved traceability management of production chains, especially when there is a crisis related to sanitation, enables consumers to access verifiable information about meat. In these situations, there is an increasing intention to purchase products of superior quality (Spence et al., 2018). Additionally, increased food safety concerns lead consumers to adopt strategies to minimize risk, including brand loyalty and supplier loyalty (Morales et al., 2013).

We compared our study results with previous studies that have found that the sale of meat in free fairs may endanger the health of the population due to lack of hygiene and sanitary inspection (Dill et al., 2014a; Diniz et al., 2013). Almeida et al. (2011) established that in free fairs, the meat is exposed to wooden benches, covered or not by tarpaulin, stored without refrigeration, and subjected to free handling by the buyers. Diniz et al. (2013) identified that in the Garanhuns microregion, meat did not

receive the appropriate hygienic treatment, from slaughter to commercialization. The meat was kept hanging on hooks and unrefrigerated, which could lead to disease transmission and endanger the health of the population.

This result demonstrated that consumers generally chose to buy meat from places that meet their expectations about sanitation. However, it is noted that few consumers do not consider marketing in butcher shops and free fairs appropriate or consider it partially adequate, indicating that improvements in marketing in these places should be adopted to meet the expectations of buyers, thus increasing their acceptance and loyalty.

The finding that a greater proportion of consumers who live in rural areas opt to purchase meat in free fairs and butcher shops may be due to them having less access to information sources, such as the Internet, newspapers, and magazines, and low level of schooling. Beliefs, traditions, culture, family income, product price, and individual preferences (Font-i-Furnols and Guerrero, 2014) may also be important factors. Solidarity with other residents and the rural producers who supply most of the products available in these fairs may also play a role.

According to Siró et al. (2008), level of schooling is a factor that influences the demands and concerns of consumers regarding product quality because the greater the knowledge about quality standards, the greater the possibility that the consumer would demonstrate a critical view on issues related to food safety. Our finding may be related to the Brazilian demographic distribution, which shows that the residents of the rural areas who buy the most in free fairs have a lower level of schooling compared with the inhabitants of the urban areas, who carry out their purchases in supermarkets (IBGE, 2010). Given this context, it is possible to observe that the knowledge of the profile of buyers of each group is important for the formulation of strategies, aiming to supply their needs and desires, thus helping the development of meat trade.

5. Conclusions

The attitudes, opinions, and concerns of meat buyers in the city of Garanhuns are associated with the perception of the risk of disease transmission due to the consumption of uninspected meat and poor sanitary conditions in commercial places, especially in free fairs. Buyers are increasingly concerned with the social issues involved in the purchase of meat, such as the social pressure exerted on the purchase decision and the ethical aspects, including animal welfare and the environment. In addition, the factors that differentiate consumers who prefer to buy meat in supermarkets from those who prefer butcher shops and free fairs are related to the customs and traditions of the region, price of the product, and hygiene of the commercial establishment. Buyers who live in the countryside and have a lower level of schooling tend to buy meat in butchers and free fairs.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

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