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Animal protein consumer's perception on the welfare of production animals in Belém, Pará State, Brazil

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ABSTRACT. The objective was to identify the level of knowledge of animal protein consumers about the welfare of production animals, in Belém city, Pará State, Brazil. The survey was carried out in two supermarkets, using 401 structured questionnaires, with 10 closed questions, with a "Yes" or "No" answer, taking into consideration, for the formation of a socioeconomic profile, questions related to gender, age group, educational level and family income of the interviewees. Most consumers of animal protein from the municipality of Belém, Pará State, Brazil, recognize that these products are part of their daily diet, however, the interviewees have no knowledge about the topic, and are not willing to pay more for the product with a seal of quality, as well as showing no interest or concern with the way animals are reared or slaughtered. The age group of consumers influences the level of knowledge about the welfare of production animals, observing that consumers aged 40 to 50 years have more knowledge on the subject. Education was a decisive factor in determining the level of knowledge of animal protein consumers about the welfare of production animals, as consumers from high school had more knowledge about the subject.

Keywords: beef; quality certificate; animal production.

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Introduction

The human being, probably, started activities of maintenance of animals for production about ten thousand years ago (Zeder & Hesse, 2000). Among the forms of interaction between humans and animals, the relationship between them and their creators, perhaps is the one that has undergone a number of changes more pronounced throughout history. According to Fraser and Broom (2002), at the beginning of the 20th century, the use of animals for production increased in association with the expansion of human needs. Then, in response to such needs, there were changes to a production system model, where animals were subjected to high stocking densities to meet commercial pressures.

In Brazil, concerns about animal welfare grow in parallel with socioeconomic development (Rocha, Lara, & Baião, 2008). In addition, it is noted that Latin American consumers have been concerned with animal welfare and rearing systems, considering welfare as a guarantee of good quality meat (Vargas-Bello-Pérez, Riveros, Köbrich, Álvarez-Melo, & Lensink, 2017; Miranda de la Lama et al., 2017).

The increase and distribution of income in Brazil caused changes in the consumption behavior of the population. The classes with greater purchasing power are directed to the consumption of products of animal origin, prioritizing quality, certification and food safety. This part of the population tends to seek products with higher added value. Classes with lower purchasing power and the rising classes, prioritize the price, practicality, convenience and safety of the food (Abreu et al., 2021). However, in general, consumers of animal origin have been increasingly interested in knowing how farm animals are raised and whether there is suffering during production and slaughter (Queiroz, Barbosa-Filho, Albiero, Brasil, & Melo, 2014).

In Rio Verde, Goiás State, Brazil, for example, consumers of products of animal origin do not have contact with farm animals, although they believe they have reasonable knowledge of the way farm animals are raised. These consumers are willing to pay up to 3% more for a product from production systems that respect animal welfare (Schaly, Oliveira, Salviano, & Abreu, 2010). In Fortaleza, Ceará State, Brazil, on the other hand, most consumers demonstrate knowledge about the benefits of animal welfare and, as a result, would be willing to pay more for meat with a certificate of animal welfare (Queiroz et al., 2014).

On the other hand, it is clear that there is a need for greater divulgation regarding the welfare of production animals, as there is a large portion of the population that still does not care about this issue, such as, for example, consumers in Santarém, west Pará State, Brazil, that although animal protein is part of their diet, they do not have knowledge about animal welfare, and as a result, they are not willing to overpay for products with a seal and are not concerned with the ways of raising the animals (Silva, Silva, & Silva, 2020).

In Belém, Pará State, Brazil, however, there are no results regarding what the consumer thinks about the welfare of production animals and how important this issue is when choosing a product. Thus, this research aimed to identify the level of knowledge of consumers of products of animal origin about the welfare of production animals, in Belém, Pará State, Brazil.

Material and methods

The research was carried out with the aid of a questionnaire with ten questions, with answers "Yes" or "No", considering gender, age group (between 18 and 30 years old, 30 and 40 years old, 40 and 50 years old; 50 and 60 years old, and over 60 years old), education (incomplete elementary, elementary, incomplete high school, high school, incomplete and higher education) and family income (between 1 and 3 minimum wages - MW; 3 and 6 MW; 6 and 9 MW; 9 and 12 MW, and over 12 MW, whose interviewees were organized into six educational levels and five levels of family income. The questionnaire contained the questions described in Table 1.

Table 1. Questions made in the questionnaire on welfare in production animals, Belém, Pará State, Brazil.

Number	Questions
1	Are animal products part of your daily diet?
2	Do you think you have enough knowledge about how the animals that are the products you consume are raised?
3	Do you worry about what methods are used to raise or slaughter animals?
4	Have you ever heard of animal welfare?
5	Do you think animals raised under welfare standards will lead to higher quality products?
6	Would you pay more for a product to ensure that animals were raised under welfare conditions?
7	Do you think that production animals are subjected to some kind of suffering during their creation?
8	Do you know that there are laws that ensure animal welfare?
9	Would you choose products certified (seals) by animal welfare agencies?
10	Would you like supermarket chains to offer products originated in accordance with welfare standards?

The interviews were conducted in two stores of a supermarket chain, in two different neighborhoods in the metropolitan region of Belém city, in Pará State, Brazil, in order to reach an audience of different socioeconomic levels. Socioeconomic classification was made, based on data from IBGE (2010) (Table 2), ordered according to the number of monthly minimum wages. Questionnaires were applied to different consumers of products of animal origin, in two supermarkets, one from each chain (chain 1 - C1 and chain 2 - C2), in a total of 401 individuals, chosen at random. Two supermarket chains were used to allow repetition among respondents of different income levels.

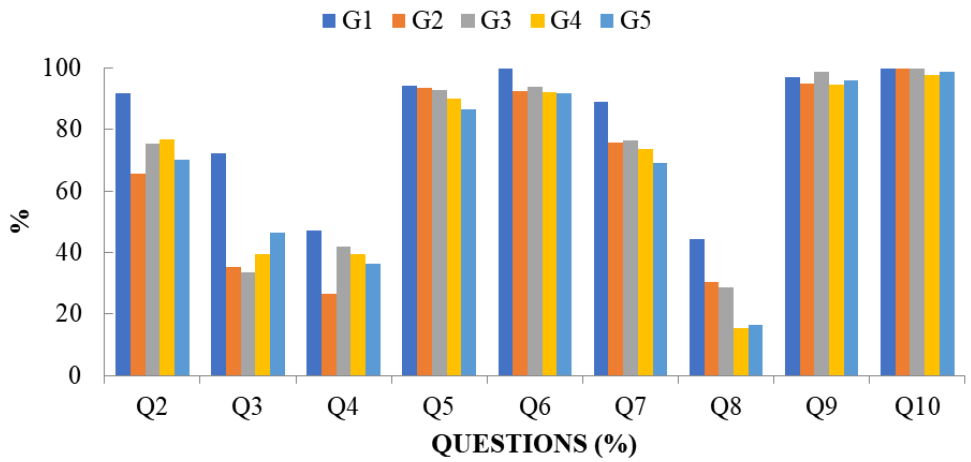
Table 2. Socioeconomic classification (IBGE).

Socioeconomic classification	Salary range (minimum wage)
A	>10
B	<10
C	3 - 5
D	1 - 3

The answers obtained were analyzed individually, in percentage, using an Excel® 2014 electronic spreadsheet. For statistical analysis, the questions were grouped as follows: 1 and 2, 3 and 4, 5 and 6, 7 and 8, 9 and 10. The questions in pairs were analyzed with a non-parametric test of significance, using the chi-square (X^2), as described by Levin (1987). The R program was used. The contingency matrix used contained two rows and two columns (2 x 2), with a degree of freedom equal to 1. The significance level was set at 5%, with a critical value of 3.84. The experiment hypothesis was considered accepted when it had a value equal to or greater than 3.84.

Results and discussion

It was found that consumers answered "Yes" in all age groups (G1, G2, G3, G4, and G5) for questions 2, 5, 6, 7, 9, and 10 (Figure 1), demonstrating that most of the interviewees say they have knowledge about the way the animals they consume are raised, highlighting that the younger consumers, members of the G1 group (18 to 30 years old), had a higher rate of conviction, corroborating with Silva et al. (2020), who found that 60% of respondents have no knowledge of how production animals are raised.



*G1 - 18 and 30 years old, *G2 - 30 and 40 years old, *G3 - 40 and 50 years old; *G4 - 50 and 60 years old, and *G5 - over 60 years old.

Figure 1. Percentage of interviewees in relation to age, in questions 2, 3, 4, 5, 6, 7, 8, 9, and 10, who answered "Yes".

Consumers in Belém, Pará State, Brazil agree that animals raised according to animal welfare standards tend to have good quality meat, as observed in the different age groups G1 (94.4%), G2 (93.7%), G3 (92.9%), G4 (90.1%), and G5 (86.6%), and as a result, would be willing to pay more for the product, to guarantee animal welfare, totaling G1 (100%), G2 (92.4%), G3 (93.9%), G4 (92.3%), and G5 (91.8%). In addition, all consumers of different age groups believe that animals go through some type of suffering (question 7) during their creation or slaughter, with a higher rate of this statement being observed in young people in G1. In a study developed in Rio Verde city, Goiás State, Brazil, Schaly et al. (2010) found that 66.9% of consumers were willing to pay up to 3% more to have meat from a livestock system that would favor animal welfare. In Santarém, in the northern region of Pará, Silva et al. (2020) found that consumers in classes A and B would be willing to pay more for meat with an animal welfare quality seal. In contrast, the authors also describe that classes C and D would not pay (Silva, Silva, & Silva, 2020).

Most consumers of different ages answered "Yes" representing G1 (97.2%), G2 (94.9%), G3 (99.0%), G4 (94.5%), and G5 (95.9%), who emphasize that they would choose certified products by agencies of animal welfare control. In addition, consumers G1 (100%), G2 (100%), G3 (100%), G4 (97.8%), and G5 (99.0%) would like supermarkets to offer a quality product, generated from animal welfare standards. According to Molento (2005), the preference for certified products tends to be more explicit by society, due to education and knowledge of definitions linked to animal welfare.

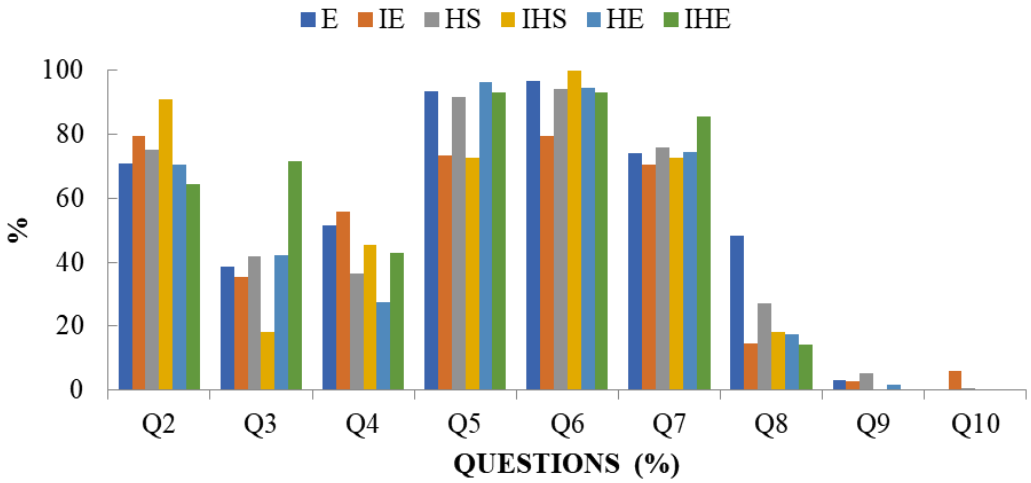
However, it was found that in questions 3, 4, and 8, there was a predominance of negative responses (No), thus, it is noted that consumers in groups G2 (64.6%), G3 (66.3%), G4 (60.4%), and G5 (53.6%) are not concerned with knowledge about the methods of rearing or slaughtering production animals, with the exception of G1 (27.8%), which corresponds to respondents aged 18 to 30, who totaled "Yes" answers in 72.2%, therefore, it is evident that younger consumers show greater concern with the methodologies adopted during the animal's life. In Rio Verde, Goiás State, Brazil, 49.01% of consumers' lack of knowledge about farming methods was also evidenced (Schaly et al., 2010).

The majority of consumers in all groups (G1 - 52%, G2 - 73.4%, G3 - 58.2%, G4 - 60.4%, and G5 - 63.9%) did not hear about animal welfare. However, consumers in the G1 (18 and 30 years old) and G3 (40 to 50 years old) groups, totaling 47.2% and 41.8%, respectively, demonstrated that they were more attuned to knowledge on the subject.

Regarding the laws, it was found that consumers aged G1, G2, G3, G4, and G5) were unaware of the legislation that protects animals (55.6, 69.6, 23.1, 84.6, and 83.5%, respectively). Consumers in the G1 (44.4%)

and G2 (30.4%) groups demonstrated to know more about this issue when comparing with the other groups. Different results were obtained in Porto Alegre, Rio Grande do Sul State, Brazil, where there was a greater demand on the part of consumers, with a higher index of knowledge on matters related to their health (Barcellos, 2004; Francisco, Nascimento, Loguercio, & Camargo, 2007).

Regarding the different levels of education, it is noted that consumers answered positively (Yes) to questions 2, 5, 6, and 7 (Figure 2), which demonstrates that the majority of respondents (E - 71%, IE - 79.4%, HS –75.2%, IHS - 90.9%, HE – 70.6, and IHE– 64.3%) say they have knowledge about the way of raising the animals they consume, highlighting that consumers of incomplete high school (IHS) had a higher rate of conviction (90.9%). Hotzel and Machado Filho (2004) describe that most of the information is passed on to the public in a simplistic way and strongly charged with emotions, which makes it difficult for consumers to understand.



*E – elementary, IE – incomplete elementary, HS – high school, IHS – incomplete high school, HE – high education, and IHE – incomplete high education.

Figure 2. Percentage of respondents with regard to education, in questions 2, 3, 4, 5, 6, 7, 8, 9, and 10, who answered "Yes".

Consumers of all educational levels claim that animals bred in accordance with animal welfare standards have good quality meat, showing that individuals with higher education (96.3%) were more convinced about the issue (E - 93.5 %, IE - 73.5%, HS –91.6%, IHS - 72.7%, HE - 96.3%, and IHE - 92.9%). In this survey, consumers with all levels of education would be willing to pay more per product with a guarantee that the production animals were raised on animal welfare standards, the group with incomplete high school (100%) was the more convinced in the answer (E - 96.8%, IE - 79.4%, HS –94.1%, IHS - 100%, HE - 94.5%, and IHE - 92.9%). According to Souza, Casot, and Lemme (2013), a seal guaranteeing the absence of mistreatment in the meat production process could have good acceptance on the part of the consumer market, if the public were correctly communicated about the differences in management standards in animal welfare.

In this survey, all consumers at different levels of education believe that production animals go through suffering during creation or slaughter (E - 74.2.%, IE - 70.6%, HS –75.7%, IHS - 72.7%, HE - 74.3 %, and IHE - 85.7%). However, consumers who had incomplete higher education demonstrated greater certainty about this issue.

It was found that most consumers of different levels of education answered "No" in questions 3, 4, 8, 9 and 10, thus, people with incomplete high school (81.8%) demonstrated not to be concerned with the methods of breeding of the production animals, as well as the other levels of education (E - 61.3.%, IE - 64.7%, HS –57.4%, HE - 57.8%, and IHE - 28.6%), with the exception of consumers of incomplete higher education who demonstrated greater level of concern, answering "Yes" at 71.4%. Similar results were found in Curitiba, Paraná State, Brazil, by Bonamigo, Bonamigo, and Molento (2012) and in Fortaleza, Ceará State, Brazil, by Queiroz et al. (2014), who report the lack of knowledge of the majority population about the systems of creation of animal production. The lack of information is one of the main bottlenecks that makes it difficult to purchase qualified products with an animal welfare seal (Raineri et al., 2012).

Most consumers of different educational levels in Belém, Pará State, Brazil, had not heard of animal welfare (E - 48.4.%, IE - 44.1%, HS –63.4%, IHS - 54.5%, HE - 72.5%, and IHE - 57.1%). People with incomplete high school were the ones who most demonstrated knowledge about the theme, with total answers "Yes" in 55.9%. The majority of consumers from all schools answered "No" - not to know about the existence of animal

protection laws (E - 51.6%, IE - 85.3%, HS –72.8%, IHS - 81.8%, HE - 82.6%, and IHE - 85.7%), so there is no distinction of knowledge, that is, having higher education does not mean knowing about every topic. Although there is currently great ease in obtaining information, through the media and the internet, it is noted that there is a need for greater interest from institutions on this important topic. It was also observed that many people prefer not to delve into this knowledge for psychological and moral reasons, as they state that when they learn about the suffering of production animals, they will feel "guilty" for consuming products of animal origin, however, many of them will not have financial means to replace these products on their tables, since it is very difficult to acquire animal protein from other foods, which they consider "more expensive".

For this reason, it was noted that respondents from all schools, in Belém, Pará State, Brazil, are not willing to pay more to obtain a product with a seal of animal welfare breeding (E - 96.8%, IE - 97.1%, HS –94.6%, IHS - 100%, HE - 98.2%, and IHE - 100%) and would not like supermarkets to supply products, according to animal welfare standards (E - 100%, IE - 94.1%, HS - 99.5%, IHS - 100%, HE - 100%, and IHE - 100%). It is worth mentioning that only a minority of consumers of incomplete elementary education (5.9%) would like supermarket chains to supply products in accordance with animal welfare standards. In Porto Alegre, Rio Grande do Sul State, Brazil, however, only 17% of consumers were not willing to overpay for certification, as they understand that it is the country's obligation to ensure the rights linked to the quality seal and signal the high value of meat as an obstacle (Velho, Barcellos, Lengler, Elias, & Oliveira, 2009).

When assessing consumers' family income, a positive response was seen (Yes) from all respondents (1-3 MW - 81.9%, 3-6 MW - 56.6%, 6-9 MW - 62.5%, 9-12 MW - 60.9%, and above 12 MW - 85%) only in question 2 (Figure 3), where most of the interviewees reported having knowledge related to the way of raising the production animals that they consume, showing superiority in consumers with higher income to 12 MW, with 85% of positive responses. Similar results were found in Fortaleza, Ceará State, Brazil, where class A dominated, that is, with a family income exceeding 12 minimum wages (Queiroz et al. (2014).

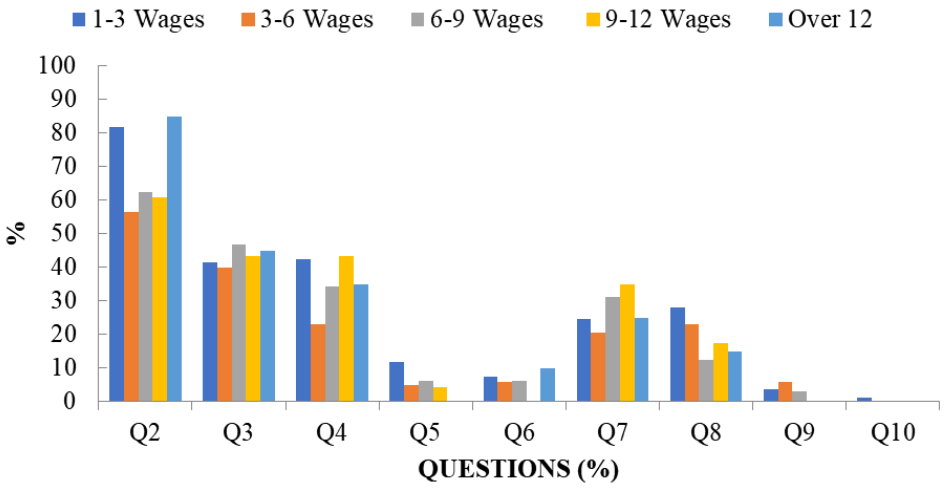


Figura 3. Percentage of respondents with regard to salary level, in questions 2, 3, 4, 5, 6, 7, 8, 9, and 10, who answered "Yes".

In questions 3, 4, 5, 6, 7, 8, 9, and 10 there were negative answers (No), thus, it can be observed in this research, that regardless of family income, consumers in Belém, Pará State, Brazil, are not concerned with the methods of raising production animals. However, consumers with an income between 6 and 9 minimum wages had a higher level of concern, with a total of "Yes" answers of 46.9%. Similarly, in Roraima, most consumers (63.78%) do not have knowledge about the creation of production animals (Pinheiro, Gomes, & Lopes, 2008). In Santarém, Pará State, Barzil, Silva et al. (2020) described that the majority of individuals interviewed have no interest or concern in knowing which method is used during the slaughter of the animals.

Consumers in the different salary ranges had not heard of animal welfare (1-3 wages - 57.6%, 3-6 wages - 77.1%, 6-9 wages - 65.6%, 9-12 wages - 56.5%, and above 12 wages - 65%), however consumers who had between 9 and 12 minimum wages showed to have more knowledge on the subject. It was identified that consumers with a family income between 9 and 12 wages are the ones who heard most about the theme (43.5%) and consumers with a family income above 12 wages do not think that animals raised under animal welfare standards can generate good quality meat (100%), in agreement with the other salary ranges (1-3 wages 88.1%, 3-6 wages 95.2%, 6-9 wages 93.8%, and 9-12 wages 95.7%).

Most consumers, regardless of family income, would not be willing to pay for a product with a guarantee that animals were raised on the condition of animal welfare (1-3 wages - 92.6%, 3-6 wages - 94%, 6-9 wages - 93.8%, 9-12 wages - 100%, and over 12 wages - 90%). However, it was noted that consumers with an income higher than 12 salaries showed more interest in this question, answering "Yes" with a total of 10%. It was found that the majority of consumers do not believe that production animals go through some kind of suffering during their breeding, affecting meat quality (1-3 wages - 75.3%, 3-6 wages - 79.5%, 6-9 wages - 68.8%, 9-12 wages - 65.2%, and over 12 wages - 75%). However, consumers 34.8% with an income between 9 and 12 wages answered that they believe that animals go through some suffering during creation. In Niterói, Rio de Janeiro State, Brazil, Andrade, Cecchin, Pinto, Nepomuceno, and Silva (2019) found that 83.6% of consumers think that production animals go through suffering during slaughter.

It was found that, regardless of family income, most consumers were aware of animal welfare laws (1-3 MW - 72%, 3-6 MW - 77.1%, 6-9 MW - 87.5%, 9 -12 MW - 82.6%, and over 12 MW - 85%), however, as they would not be willing to buy products with animal welfare certificate (1-3 MW - 96.3%, 3-6 MW - 94%, 6-9 MW - 96.9%, 9-12 MW - 100%, and over 12 MW - 100%), and would not like supermarkets to supply products produced in accordance with welfare standards (1-3 SW - 98.8%, 3-6 SW - 100%, 6-9 SW - 100%, 9-12 SW - 100%, and over 12 SW - 100%). Respondents with an income between 1 and 3 minimum wages (28%) are the most knowledgeable about welfare laws, and consumers with an income between 6 and 12 wages (100%) would be willing to pay a little more for products with animal welfare seal and were interested in the selling of these products in supermarkets (100%), a fact also found with consumers with an income over 12 wages (100%). Similar results were observed in Porto Alegre, Rio Grande do Sul State, Brazil, identifying that 68% of consumers would be willing to overpay, around 10% for quality meat and well-kept animals (Velho et al., 2009).

Table 3 shows the result of the chi-square test (X^2) in the different age groups for each question. It was found that there was a difference ($p < 0.05$) between the groups in questions 2, 3, and 8. In question 2, it was identified that the G3 group aged between 40 and 50 years old had the highest percentage (74a, b consumers) of negative responses (No), demonstrating to have less knowledge about the animal welfare theme, differing from the groups G1 (18 to 30 years old) (33a consumers) and G2 (30 to 40 years old) (52b consumers), but with results similar to the group G4 (70a, b consumers) and G5 (68a, b consumers). Young consumers (18 to 30 years old) show a lower rate of negative (No) responses about knowledge of the subject, when comparing to other groups.

Table 3. Distribution of frequencies obtained for questions 2, 3, 4, 5, 6, 7, 8, 9, and 10 according to the age group of consumers.

Chi-square (X^2)	Answers	G1	G2	G3	G4	G5
Q2	No	33_a	52_b	$74_{a, b}$	$70_{a, b}$	$68_{a, b}$
	Yes	3_a	27_b	$24_{a, b}$	$21_{a, b}$	$29_{a, b}$
Q3	No	26_a	28_b	33_b	36_b	$45_{a, b}$
	Yes	10_a	51_b	65_b	55_b	$52_{a, b}$
Q4	No	17_a	21_a	41_a	36_a	35_a
	Yes	19_a	58_a	57_a	55_a	62_a
Q5	No	2_a	5_a	7_a	9_a	13_a
	Yes	34_a	74_a	91_a	82_a	84_a
Q6	No	0_a	6_a	6_a	7_a	8_a
	Yes	36_a	73_a	92_a	84_a	89_a
Q7	No	4_a	19_a	23_a	24_a	30_a
	Yes	32_a	60_a	75_a	67_a	67_a
Q8	No	16_a	$24_{a, b}$	$28_{a, b}$	14_b	16_b
	Yes	20_a	$55_{a, b}$	$70_{a, b}$	77_b	81_b
Q9	No	1_a	4_a	1_a	5_a	4_a
	Yes	35_a	75_a	97_a	86_a	93_a
Q10	No	0_a	0_a	0_a	2_a	1_a
	Yes	36_a	79_a	98_a	89_a	96_a

^{a,b,c,d} percentage among groups, distinct lowercase letters, on the same line are different ($P<0.05$). *G1 - 18 and 30 years old, *G2 - 30 and 40 years old, *G3 - 40 and 50 years old; *G4 - 50 and 60 years old, and *G5 - over 60 years old. *Q = question.

When evaluating the positive answers (Yes) on question 2, it was found that the group G5 (29a, b consumers) has more sufficient knowledge about how animals are raised, diverging ($p < 0.05$) from the group G1 (3a consumers) and G2 (27b consumers), and presenting similar results to the group G3 (24a, b consumers) and G4 (21a, b consumers), that is, younger consumers are those who have less knowledge about the subject.

Corroborating the study by Queiroz et al. (2014), who in Fortaleza, Ceará State, Brazil, identified greater knowledge about the theme among consumers aged 40 to 50 years, stating that about 60% of the interviewees did not hear about the theme.

Consumers over the age of 60 belonging to the G5 group (45a, b consumers) showed that they were not concerned ($p < 0.05$) with the methods of raising or slaughtering the animals. Young consumers G1 (26a consumers) had a lower level of concern, in addition, there were no differences between groups G2 (28b consumers), G3 (33b consumers), and G4 (36b consumers). Bonamigo et al. (2012) describe similar results, where they showed that the population of Curitiba, Paraná State, Brazil, does not know the ways of raising animals.

Analyzing the positive answers (Yes) on question 3, it was found that the G3 group (65b consumers) are the ones that are most concerned with the methods of raising or slaughtering farm animals ($p < 0.05$), diverging from the group G1 (10a consumers), and presenting similar results to the group G2 (51b consumers), G4 (55b consumers) and G5 (52a, b consumers), which indicates that younger consumers are the least knowledgeable about the thematic. This can be explained by the fact that the purchase of meat products is carried out mainly by their parents, who tend to obtain more information about the products that the family consumes.

The G3 group (28a, b consumers), aged between 40 and 50 years, demonstrated knowledge about animal welfare laws ($p < 0.05$), differing from the other groups G1 (16a consumers), G4 (14b consumers) and G5 (16b consumers), however did not differ from the G2 group (24a, b consumers), having similar level of responses. Consumers in the G4 group (50 to 60 years old) had a lower response rate when compared to the other groups. It was observed that questions 4, 5, 6, 7, 9, and 10 showed no differences ($p > 0.05$). Evaluating the "Yes" answers, in question 8, it was found that the G5 group (81b consumers), aged over 60 years, are those who have the most knowledge about animal welfare laws ($p < 0.05$), differing from the G1 group (20a consumers) and presenting similar results to the G4 group (77b consumers). Consumers in the G2 group (55a, b consumers) and G3 (70a, b consumers) had similar levels of knowledge, not diverging from each other, that is, younger consumers are the least knowledgeable about the laws that ensure animal welfare in Belém, Pará State, Brazil.

Consumers who had high school education (74a, b consumers) ($p < 0.05$) did not hear about animal welfare and do not believe that animals raised on animal welfare generate good meat quality (17a, b consumers), in addition to not being aware of animal welfare laws (55a, b consumers), when compared to the other groups (Table 4). Consumers with incomplete high school (5a, b consumers) were the least responders to have heard about the issue and have no knowledge of the laws that ensure animal welfare (2a, b consumers), as well as consumers of incomplete higher education (2a, b consumers). Respondents who had incomplete higher education (1a, b, c, and d consumer) are the ones who least answered "No" to believe that animals raised on animal welfare generate good quality meat. For the other questions and educational levels, there were no differences ($p < 0.05$) between them.

Table 4. Distribution of frequencies obtained for questions 2, 3, 4, 5, 6, 7, 8, 9 and 10 according to consumers' education.

Chi-square (X^2)	Answers	E	IE	HS	IHS	HE	IHE
Q2	No	22_{a}	27_{a}	152_{a}	10_{a}	77_{a}	9_{a}
	Yes	9_{a}	7_{a}	50_{a}	1_{a}	32_{a}	5_{a}
Q3	No	12_{a}	12_{a}	86_{a}	2_{a}	46_{a}	10_{a}
	Yes	19_{a}	22_{a}	116_{a}	9_{a}	63_{a}	4_{a}
Q4	No	$16_{a, b}$	19_{b}	$74_{a, b}$	$5_{a, b}$	30_{a}	$6_{a, b}$
	Yes	$15_{a, b}$	15_{b}	$128_{a, b}$	$6_{a, b}$	79_{a}	$8_{a, b}$
Q5	No	$2_{a, b, c, d}$	$9_{c, d}$	$17_{a, b}$	$3_{b, d}$	4_{a}	$1_{a, b, c, d}$
	Yes	$29_{a, b, c, d}$	$25_{c, d}$	$185_{a, b}$	$8_{b, d}$	105_{a}	$13_{a, b, c, d}$
Q6	No	1_{a}	7_{a}	12_{a}	0_{a}	6_{a}	1_{a}
	Yes	30_{a}	27_{a}	190_{a}	11_{a}	103_{a}	13_{a}
Q7	No	8_{a}	10_{a}	49_{a}	3_{a}	28_{a}	2_{a}
	Yes	23_{a}	24_{a}	153_{a}	8_{a}	81_{a}	12_{a}
Q8	No	15_{a}	5_{b}	$55_{a, b}$	$2_{a, b}$	19_{b}	$2_{a, b}$
	Yes	16_{a}	29_{b}	$147_{a, b}$	$9_{a, b}$	90_{b}	$12_{a, b}$
Q9	No	1_{a}	1_{a}	11_{a}	0_{a}	2_{a}	0_{a}
	Yes	30_{a}	33_{a}	191_{a}	11_{a}	107_{a}	14_{a}
Q10	No	0_{a}	2_{a}	1_{a}	0_{a}	0_{a}	0_{a}
	Yes	31_{a}	32_{a}	201_{a}	11_{a}	109_{a}	14_{a}

^{a,b,c,d} percentage among groups, distinct lowercase letters, on the same line are different ($P<0.05$). * E – elementary, IE – incomplete elementary, HS – high school, IHS – incomplete high school, HE – high education and IHE – incomplete high education. *Q = question.

When analyzing the indexes of "Yes" answers in the questioned questions, it was found that the interviewed consumers who had a high school education (128a, b consumers), said ($p < 0.05$) that they had heard more about the subject of animal welfare, as well as they believe that animals raised on welfare generate good meat quality (185a, b consumers), in addition to being aware of animal welfare laws (147a, b consumers). Consumers with incomplete high school (6a, b consumers), on the other hand, were those who least heard about the topic and are those who, to a lesser extent, were aware of the laws that ensure animal welfare (9a, b consumers), in addition to being the ones that least answered "Yes" when asking whether animals raised under animal welfare provide good quality meat. For the other questions and educational levels, no differences were observed ($p < 0.05$) between the averages.

In question 2, it was identified that consumers with an income between 1 and 3 minimum wages (199a, b consumers) had the highest number of negative responses "No" ($p < 0.05$), thus demonstrating less knowledge about the animal welfare theme and heard little about it, diverging widely from the other salary ranges (3-6 - 64a, b, 6-9 - 20a, b, 9-12 - 14a, b, and over 12 -17a, b) (Table 5). On the other hand, consumers with incomes between 3 and 6 wages (47b consumers) differed ($p < 0.05$) from salary ranges 6 and 9 (20a, b consumers), 9 and 12 (14a, b consumers), and over 12 (17a, b consumers). However, among these groups there were no differences, so consumers with salary ranges 6 and 9, 9, and 12 and above 12 have similar knowledge.

Table 5. Distribution of frequencies obtained for questions 2, 3, 4, 5, 6, 7, 8, 9, and 10 according to consumers' family income.

Chi-square (X^2)	Answers	1-3 Wages	3-6 Wages	6-9 Wages	9-12 Wages	Over 12 Wages
Q2	No	199_{a}	47_{b}	$20_{a, b}$	$14_{a, b}$	$17_{a, b}$
	Yes	44_{a}	36_{b}	$12_{a, b}$	$9_{a, b}$	$3_{a, b}$
Q3	No	101_{a}	33_{a}	15_{a}	10_{a}	9_{a}
	Yes	142_{a}	50_{a}	17_{a}	13_{a}	11_{a}
Q4	No	103_{a}	19_{b}	$11_{a, b}$	$10_{a, b}$	$7_{a, b}$
	Yes	140_{a}	64_{b}	$21_{a, b}$	$13_{a, b}$	$13_{a, b}$
Q5	No	29_{a}	4_{a}	2_{a}	1_{a}	0_{a}
	Yes	214_{a}	79_{a}	30_{a}	22_{a}	20_{a}
Q6	No	18_{a}	5_{a}	2_{a}	0_{a}	2_{a}
	Yes	225_{a}	78_{a}	30_{a}	23_{a}	18_{a}
Q7	No	60_{a}	17_{a}	10_{a}	8_{a}	5_{a}
	Yes	183_{a}	66_{a}	22_{a}	15_{a}	15_{a}
Q8	No	68_{a}	19_{a}	4_{a}	4_{a}	3_{a}
	Yes	175_{a}	64_{a}	28_{a}	19_{a}	17_{a}
Q9	No	9_{a}	5_{a}	1_{a}	0_{a}	0_{a}
	Yes	234_{a}	78_{a}	31_{a}	23_{a}	20_{a}
Q10	No	3_{a}	0_{a}	0_{a}	0_{a}	0_{a}
	Yes	240_{a}	83_{a}	32_{a}	23_{a}	20_{a}

^{a,b,c,d} percentage among groups, distinct lowercase letters, on the same line are different ($p < 0.05$). *Q = question.

When evaluating the "Yes" answers obtained in question 4, it was found that consumers with an income between 1 and 3 minimum wages (140a, b consumers) are the ones who least heard about animal welfare. However, when looking at the total number of "Yes" answers, it was noted that this same salary range is higher in the positive answers on the question. This was due to the greater number of respondents having an income between 1 and 3 minimum wages. Among the other questions and age and wage groups, there were no differences ($p > 0.05$). Consumers with an income between 1 and 3 minimum wages (44a consumers) answered "Yes" in question 2, therefore they have greater knowledge about the welfare of production animals ($p < 0.05$), differing from the other salary ranges.

Conclusion

Most consumers of products of animal origin in Belém city, Pará State, Brazil, recognize that these products are part of their daily diet, but do not have knowledge on the subject of animal welfare, and are not willing to pay more for the product with a seal of quality, as well as, do not show interest or concern with the way in which livestock are bred or slaughtered. In addition, consumers in Belém are not aware of animal welfare laws and are not concerned with how animals are raised or slaughtered, a fact that is mainly seen among young people. There is influence of the age group, however, education is a decisive factor in determining the level of knowledge of consumers of products of animal origin, in Belém, Pará State, Brazil, about the welfare of production animals. It is clear, therefore, the need for more research, disciplines in

schools, and scientific disclosures on the subject of animal welfare and its influence on the slaughter and quality of meat and other products of animal origin.

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