













# Profile of milk consumers and determinants of A2A2 milk consumption in the Tocantins State\*

## *Perfil dos consumidores de leite e fatores determinantes do consumo de leite A2A2 no estado do Tocantins*

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### ABSTRACT

The dairy industry diversifies products with organoleptic, dietary, functional, and nutritional properties according to consumer demands and welfare. This study aimed to examine the profile of consumers, data on milk consumption, knowledge, and familiarity with A2A2 milk in the Tocantins State, Brazil. A qualitative survey was carried out through a questionnaire applied to 389 people, distributed in 34 municipalities. Regarding the consumption of dairy products, 21.31% of participants described having some type of discomfort when consuming them. Among participants, 46.27% consumed one to two liters, 28.28% two to four liters, and 25.45% more than four liters per week. Milk was the main dairy product consumed, according to 59.13% of participants. Of all respondents, 76.10% pay little or no attention to the information on the label, versus 23.90% who did not. Regarding A2A2 milk, 40.36% possessed some knowledge about it, while 59.64% did not. 42.93% and 30.59% of participants stated they would be willing to pay over 10% or 50% more, respectively, whereas 24.94% would not pay any additional amount on the price of A2A2 milk. Willingness to pay a low additional amount was related to consumers who heard of, but knew little about this product, whereas the likelihood of paying higher additional amounts was associated with respondents who heard and know about the product.

**Keywords:** Functional food. Consumer behavior. Marketing strategy. A2 milk.

### RESUMO

Atualmente, a indústria láctea diversifica produtos com propriedades organolépticas, dietéticas, funcionais e nutricionais em função de demandas do consumidor e do bem-estar. Assim, objetivou-se estudar o perfil dos consumidores, incluindo dados de consumo de leite, conhecimento e familiaridade com o leite A2A2 no estado do Tocantins. Foi realizado uma pesquisa qualitativa, através de questionário, com 389 pessoas distribuídas em 34 municípios no Tocantins. Em relação ao consumo de lácteos, 21,31% apresentam algum tipo de desconforto ao consumirem, e, 46,27% possuem um consumo semanal de um a dois litros, 28,28% entre dois a quatro litros e 25,45% com consumo superior a quatro litros, sendo o leite o principal produto lácteo consumido por 59,13% dos entrevistados. Dos entrevistados, 76,10% tem pouca ou nenhuma atenção às informações do rótulo contra 23,90% que possuem muita atenção, e 40,36% e 59,64% detinham ou não algum conhecimento sobre leite A2A2, respectivamente. Foi observado que 42,93% e 30,59% estariam dispostos a pagar mais de 10% ou mais de 50%, respectivamente, e 24,94% revelaram não pagar nenhum acréscimo sobre o valor para o leite

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A2A2. No entanto, a capacidade de consumo está diretamente ligada ao nível de conhecimento e familiaridade sobre leite A2A2, ou seja, pagar um valor adicional baixo demonstrou relação com consumidores que possuem conhecimento sobre, mas conhecem pouco esse produto, enquanto que pagar valores adicionais maiores esteve relacionado com entrevistados que ouviram falar e conhecem sobre o produto.

**Palavras-chave:** Alimento funcional. Comportamento consumidor. Estratégia de marketing. Leite A2.

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## Introduction

Cow's milk and its derivatives are considerable sources of proteins of high biological value. Thus, it is widely consumed by the world population, with widely recognized benefits for human health as a component of a balanced and healthy diet (Dutra et al., 2007).

The industry, market, and production chain as a whole have sought to offer products that meet the needs, demands, and qualities identified by the consumer (Martins et al., 2014). We are living in the era of consumer protagonism, as the market selects products based on consumer demand and needs. The food industry must constantly reinvent itself to meet the expectations of the consumer, who is more demanding each year and concerned with health and welfare (Pacchiarotti et al., 2020). In the dairy industry, it was not very different, and currently, there are several types of milk and derivatives that make life easier for consumers and satisfy their requirements.

Recently, milk with the A2A2 seal has been offered in the Brazilian market because it is related to increased protein and volume and reduced fat levels. In addition, it has better digestibility and is not associated with the development of milk protein allergies or human diseases, unlike milk that contains the A1A1 variant (Pacchiarotti et al., 2020; Sharma et al., 2013). There has been a growing increase in

the share of the population that feels some discomfort when consuming regular (A1A1 type) milk and its derivatives. An alternative to address this problem is the production of A2A2 milk, considered a product with better digestion (Bentivoglio et al., 2020; Jianqin et al., 2015; Sheng et al., 2019).

One such example is the growth of products aimed at market niches. These include people who have a very strong and non-negotiable ideology, values, and preferences and who seek brands that develop products that meet these needs (Empresa Brasileira de Pesquisa Agropecuária, 2019; Liotti et al., 2015; Németh et al., 2020; Rizzo et al., 2020).

However, consumer behavior is affected by different cultural, economic, social, and family factors that act together, interfering with product purchasing decisions (Engel et al., 2000). In the current world scenario, researching and identifying the customer's consumer profile is ultimately crucial and represents a differential for companies. Some authors (Kotler & Keller, 2012; Solomon, 2002) summarize that behavior involves different processes, such as meeting needs and desires.

Therefore, this study was undertaken to examine the profile of milk consumers and analyze determining factors for the consumption of A2A2 milk in the state of Tocantins, Brazil.

## Material and Methods

To define the profile and degree of knowledge of milk consumers in the state of Tocantins and analyze knowledge and familiarity about A2A2 milk, a descriptive, exploratory, survey-type study was carried out using the Google Forms semi-structured digital questionnaire, which is widely disseminated via social networks (Instagram and WhatsApp), from January to September 2021. Support was provided by the academic community of the Federal University of Tocantins (UFT), technicians in the area, associations of producers, and rural producers.

As a way to ensure sample representativeness and homogeneous distribution, the number of respondents was defined by estimating the state's population proportion – 1,607,363 (Instituto Brasileiro de Geografia e Estatística, c2021). The sampling unit was calculated using the Calculator.net online calculator tool, adopting a 95% confidence interval

( $Z= 1.96$  standard deviation) and a 5% error margin, as described by Malhortra (2012).

Participation in the questionnaire was voluntary and random, by milk consumers or non-consumers from different municipalities in the state of Tocantins. The study involved 389 participants, distributed in 34 municipalities, who responded to a questionnaire consisting of 19 questions, divided into three sections. The first part referred to the profile of the interviewee; the second aimed to identify the consumption of dairy products in general, as well as the frequency and quantity consumed, and the third part concerned the interviewee's knowledge of A2A2 milk.

The categorization of the consumer's level of knowledge is based on the customer's sophistication levels, which represent their degree of knowledge about the product and its particularities (Fregni, 2016). Based on Fregni (2016), Nogueira & Souza (2009), and Pieritz Netto (2013), consumers can be divided into three main levels of sophistication or knowledge: high, medium, and low knowledge about a product, problem, or solution.

In the present research, five questions about A2A2 milk were presented in the questionnaire, which allowed us to categorize the level of knowledge of consumers regarding the indicated product. They are: 1. Have you ever heard of A2A2 milk? 2. Do you know the differential and properties of A2A2 milk? 3. How much more would you be willing to pay for a dairy product certified for the A2A2 milk type? 4. For you to overpay for a dairy product certified for A2A2 milk, what would be your main criteria? 5. Do you know about A2A2 milk? Based on the answers, the level of satisfaction or knowledge of consumers about A2A2 type milk was established.

In the present study, we used only the interviewee's information, in which we evaluated how much they know or know about the product (direct questions with direct answers (very, little, reasonable, or no knowledge)). From these answers, we verified the association of them with the probabilities of payment, more or not for the product. This was done to demonstrate the relation between the probability of paying more and the self-knowledge of respondents (who considered themselves less or more familiar with A2A2 milk).

After the questionnaires were applied, a database was created using an electronic spreadsheet, in which the absolute and relative frequencies were performed. To evaluate the perception of consumers regarding A2A2 milk, bar graphs and scatterplots were created where some qualitative variables and probability estimates were grouped, using Minitab 17 software.

## Results and Discussion

The obtained data revealed greater participation of women (62.30%), while men represented 37.70% of the responses. In terms of marital status, 57.58% of the people identified themselves as single, 37.01% as married, 2.83% in a stable relationship, and only 0.77% as widowed. The participants inhabited 24.46% of the municipalities of the Tocantins, spread across different regions of the state. This percentage corresponds to a confidence level of 90% and a sampling error of 10%. Regis et al. (2019), Ferreira et al. (2017), Longhi et al. (2010), and Molina et al. (2010) found, in the interviewed populations, a higher frequency of females, followed by the 'married' marital status and/or stable union as the most frequent among interviewees. The family composition of the interviewees may be influenced by the public evaluation, which consisted of 15.32% of university students, 8.75% of employees and professors of the educational institution, and 34.78% of families distributed in the surveyed municipalities, 16.47% of family members of students, teachers, and technicians, and 24.68% of respondents from groups of family and professional friends.

Still in terms of profile, the household composition of the respondents was as follows: 5.40% constituted a family of one member; 16.45%, two members; 21.34%, three members; and 56.80%, four or more members. Additionally, according to Instituto Brasileiro de Geografia e Estatística (2016), in 2015, multi-person arrangements with relatedness, that is, families, accounted for 85.1% of total arrangements in Brazil, and the most common type of family nucleus was a couple with children (42.3% of the total arrangements), followed by a couple without children (20.0%) and a woman without a spouse, with children (16.3%).

Regarding dairy consumption in general, 46.27% of respondents reported they consume one to two liters of milk in their homes per week; 28.28% between two to four liters, and 25.45% have higher weekly consumption, of four liters. Among the participants, the main dairy product consumed is milk, as affirmed by 59.13% of them (Table 1).

The presence of this food in the diet is mainly because it is a source of proteins and essential minerals for the promotion of growth and maintenance of life in humans (Molina et al., 2010). Furthermore, the consumption of

Table 1 – Percentage of dairy products consumed by the participants

Dairy product	F%
We do not consume dairy	0.52
Yogurt	5.91
Butter	12.85
Cheese	21.59
Milk	59.13



milk around the world goes back to ancient civilizations and helps us understand our evolution as a species. Today, milk and its derivatives are present in most Brazilian homes and was related to cultural, regional, social class, age group, daily needs, and quality of life (Ministério da Saúde, 2014; Muniz et al., 2013; Sociedade Brasileira de Alimentação e Nutrição, 2015). Similar findings were reported by Longhi et al. (2010), Aguilar et al. (2012), Dezani et al. (2015), Oliveira et al. (2020), Ferreira et al. (2017), and Regis et al. (2019).

In an attempt to typify a pattern for the criterion established for the purchase of dairy products, we observed that the parameters of a brand, price, and packaging corresponded to 29.56%, 23.91%, and 1.54% respectively, of the consumer's preference regarding the purchase criterion. Of the remaining consumers, 45% considered the association of two or more criteria, involving price, brand, packaging, and label information.

To clarify the information described above, respondents were asked about the degree of importance of the information on the label as a decisive purchase factor. According to the responses, 76.10% pay little or no attention to the label information, and only 23.90% pay attention or a lot of attention to it.

When asked about the type of milk they consumed, 17.48% of the interviewees declared they had to consume lactose-free products due to some discomfort, whereas 82.52% did not consume this type of product. Nevertheless, it was also reported that 21.31% had some type of discomfort when consuming regular marketed milk, regardless of whether it was whole, skimmed, or semi-skimmed. Based on these questions, the respondents were asked to describe their knowledge about A2A2 milk, and 59.64% said they had never heard anything about the product, compared to 40.36% who possessed some knowledge.

Based on the proposed methodology of the level of knowledge, we found that 54.3% of respondents had low knowledge, 37.5% had medium knowledge and only 8.2% considered having high knowledge about A2A2 milk, its benefits, and properties. Considering prior knowledge about A2A2 milk and its differential, the participants were asked how much more they would be willing to pay for this type of product. Among them, 42.93% would be willing to pay 10% more than the commercial value of pasteurized milk; 30.59%, up to 50% more; 1.54%, over 50% more; and 24.94% would not pay an additional percentage on the value of pasteurized milk.

In this same line of thought, the respondents were asked which criterion would be decisive for them to purchase

A2A2 milk-based products. According to the results, 49.61% of the participants stated it would be the relationship between the brand and the certification of the product; 29.05% said information about the product on the label; 15.94% declared they would not buy the product, and only 5.40% would be satisfied with the brand.

The results of descriptive statistics revealed that, when choosing a product, consumers take into account the brand, price, and packaging, with the brand constituting the highest percentage. This condition shows the trust and quality assigned by consumers to certain manufacturers, which was also described by Regis et al. (2019).

However, the price was also highlighted, since the consumer tends to opt for cheaper products due to the socioeconomic conditions of the population. In studies led by Molina et al. (2010), Mallmann et al. (2012), Passarini et al. (2014), and Regis et al. (2019) in the municipalities of Maringá (Paraná), Palmeira das Missões (the Rio Grande do Sul), São José do Rio Preto (São Paulo), and Santa Inês (Bahia), respectively, the price was also found to represent a purchase decision factor by the consumer. In this way, there is no use in the product having excellent quality if its price is not one the consumer is willing to pay. Some consumer profiles are more quality-oriented, but, for many people, purchases are still exclusively price-oriented (Schiffman & Kanuk, 2000).

In association with this orientation, we found that 75.06% were willing to pay more for a differentiated product such as A2A2 milk, whereas 24.94% would not pay more for this type of product. Thus, it is up to the market to explore this potential, whether through the use of marketing tools, marketing strategies, or benchmarking. These would allow competitive advantages, customer loyalty, and the offer of a quality product, as consumers in general are increasingly informed and concerned about health.

According to Schiffman & Kanuk (2000), the consumer is a complex element, and his/her decision-making process has also become extremely challenging. Today's consumers have greater access to information channels and are demanding the consumption of products that respect environmental issues and favor quality health. It is up to the market to enhance techniques and methodologies for recognizing these transformations as well as to develop strategies aimed at meeting and exceeding all expectations concerning the product and its added value (Engel et al., 2000).

Knowledge of or unfamiliarity with the differential of A2A2 milk was in a more balanced proportion among respondents who declared willingness to pay an extra 10% to 20% or over 20% more for this product (Figure 1A). However, willingness to pay a little more (up to 10%) or

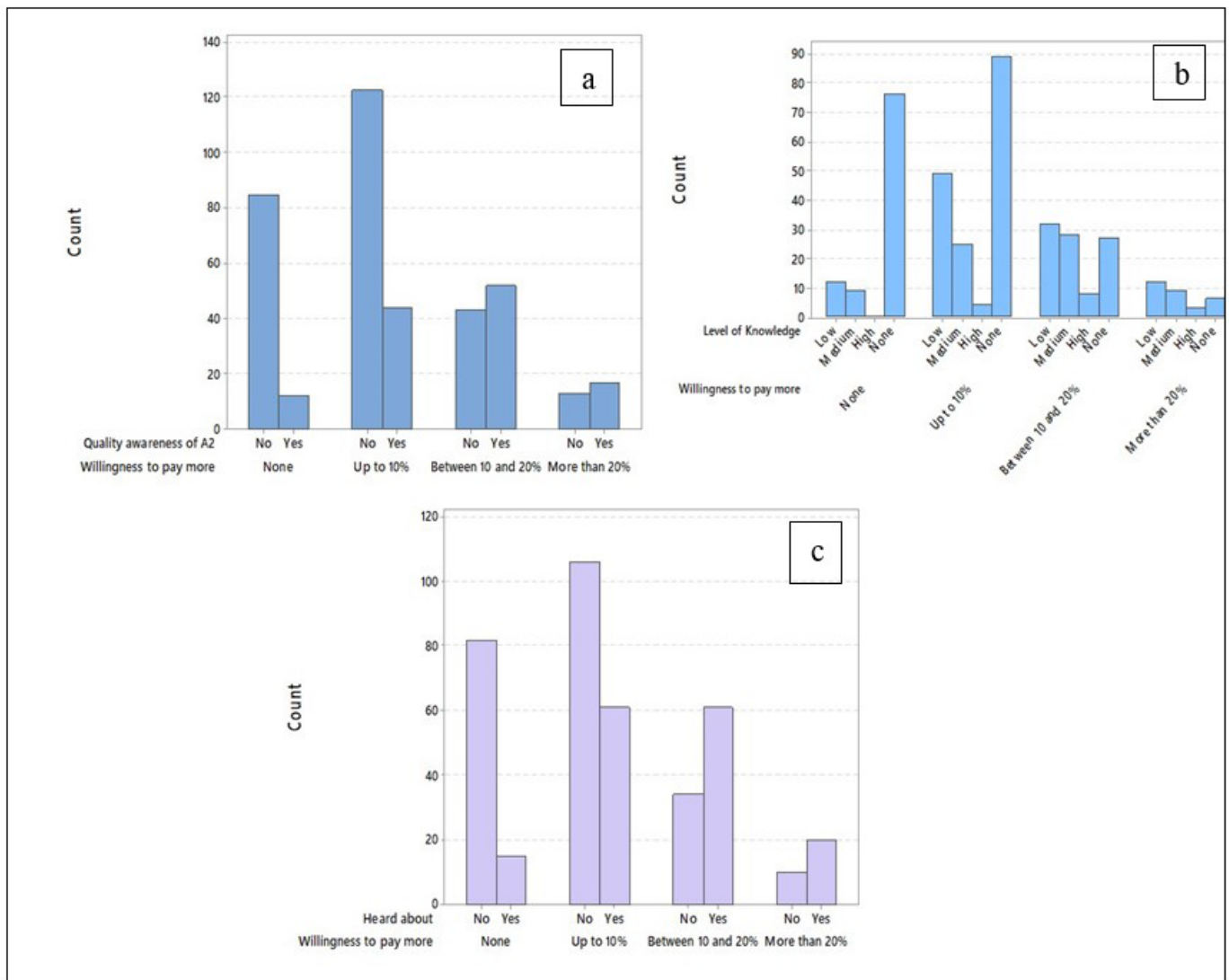


Figure 1 – Consumers' willingness to pay additional amounts for A2A2 milk according to knowledge about the product's differential (a), level of knowledge (b), and familiarity with A2A2 milk (c).

not to pay any extra was related to a lack of familiarity with the differential of A2A2 milk (Figure 1A).

Similarly, a considerable proportion of those who claimed to not know about A2A2 milk said they would pay a little extra (up to 10%) or no additional amount (Figure 1C). The relationship between lack of knowledge and willingness to pay little (up to 10%) or not to pay any extra amount was confirmed, as the interviewees were more willing to pay more (over 10%) when they had heard about A2A2 milk. On the other hand, respondents who had not heard about it stated they would only pay up to 10% or no extra amount (Figure 1A).

A complementary analysis comparing levels of knowledge and familiarity with A2A2 milk against probability values revealed that consumers who claimed to have heard of A2A2 milk, as well as those who have greater knowledge about this product, are more likely to pay higher additional amounts between 10% and 20% (Figure 2C) or more than

20% (Figure 2D). Consumers who have heard of the milk, but know little about it, would likely pay a smaller additional amount (Figure 2B).

The probability of respondents not paying the additional amount was greater when they had not heard of A2A2 milk (Figure 2A). These are more likely (between 0.46 and 0.48) to pay low additional amounts (up to 10%) than those who have heard about the milk, who, in turn, may be more likely to pay over 10% more.

Willingness to pay additional amounts, which would motivate the industry and producers, depends on the dissemination of this dairy product. Therefore, it would be opportune for A2A2 milk to be the target of marketing and advertising to a greater extent and intensity, to inform and clarify the properties and differentials of this product. Milk is the most marketed and consumed product, and the introduction of A2A2 milk may represent a new market niche in the industrial and commercial scenario of Tocantins.

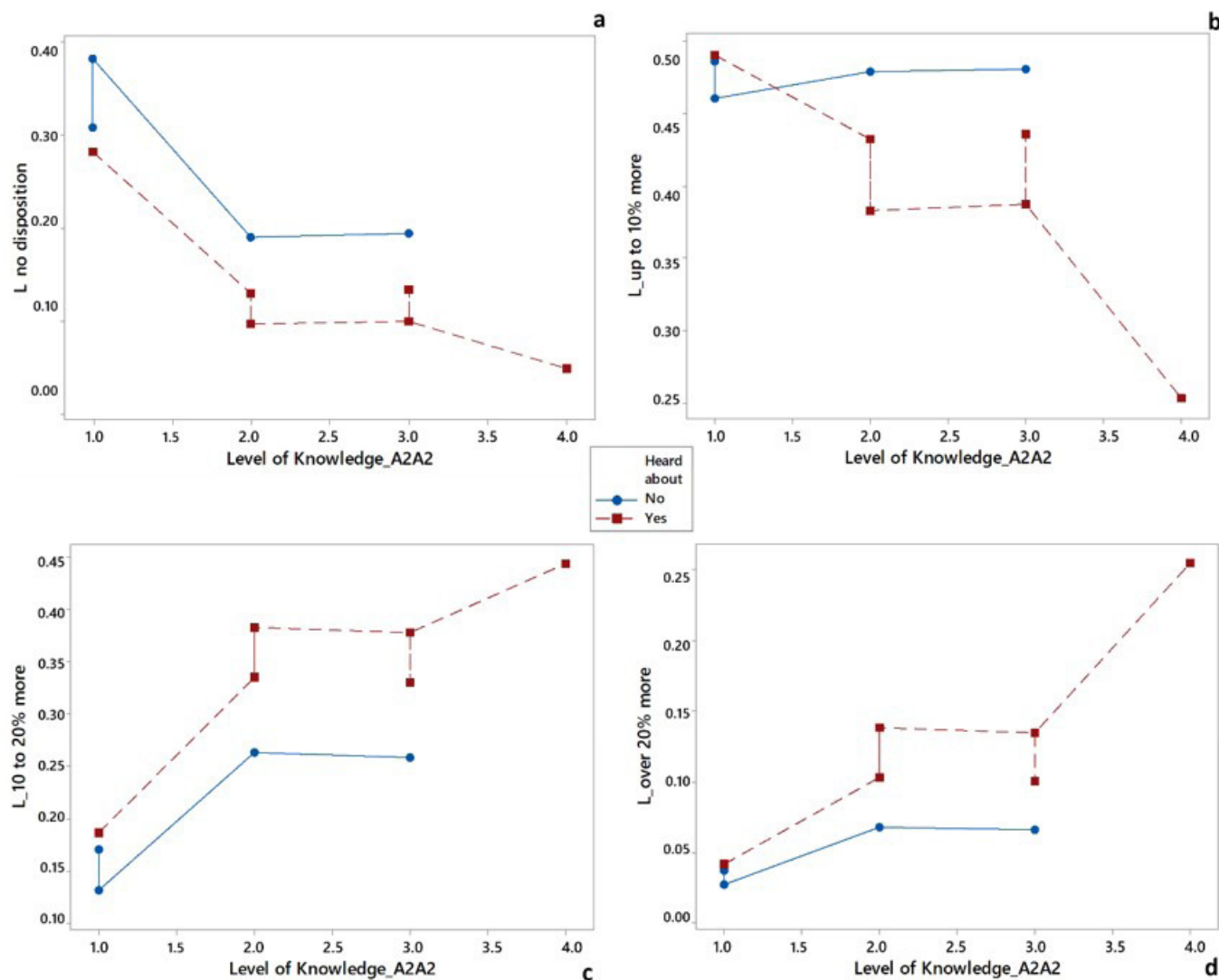


Figure 2 – Likelihood of consumers paying additional amounts for A2A2 milk according to the level of knowledge and familiarity with A2A2 milk; a = no disposition; b = up to 10% more; c = 10% to 20% more; d = over 20% more.

Besides, provided with a marketing policy and adequate information, and a focus on the general population, it can leverage that market.

It is important to emphasize that the competitiveness of the dairy industry relies on attention to consumer behavior. However, the products available in the retail market need to better adapt to the consumer's lifestyle and needs (Federação das Indústrias do Estado do Tocantins, 2018), thus favoring the formation of a niche for the A2A2 milk market.

## Conclusions

The population of the state of Tocantins, Brazil, has a high frequency of cow milk consumption with a considerable portion demonstrating some level of requirement regarding the nutritional value and specificity regarding health problems related to the type of milk, such as A2A2. Consumers are also attentive to product

information issues. However, the consumption capacity of new dairy products, such as A2A2 milk, and their demand are directly linked to the level of knowledge and information about the product.

## Conflict of Interest

The authors declare no conflicts of interest.

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