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Consumer profile and their perception of chickpea antipasto containing probiotic bacteria

Perfil de consumidores e sua percepção sobre antepasto de grão de bico contendo bactéria probiótica

Abstract

Introduction: The food industry and researchers have been dedicated to developing new functional products with more natural characteristics. Thus, studies that identify the demand of consumers seeking to meet their desires are important. **Objective:** To evaluate the profile and perception of consumers about antipasti, probiotics and purchase intention of a chickpea antipasti added with probiotic bacteria. **Method:** The evaluation was carried out online, through a questionnaire sent to 322 participants, containing 33 questions. Word clouds were created with the results obtained. **Results:** Most participants live in the Southeast region, 72.7% are female, 37.3% have a family income of up to three minimum wages, 75.8% know what antipasto is and more than half have consumed chickpea and knows its benefits. More than 84.0% of the participants know what probiotics are and 90.1% have already consumed dairy-based probiotic products. However, 78.0% showed interest in options for probiotic products of plant origin. About the characteristics that the participants consider that best describe the antipasto, the most cited were: Pasty, Soft, Bittersweet, Salty and Firm. The word cloud showed that respondents associate probiotics with gut health and 36% of those would be willing to buy probiotic-containing chickpea antipasto if the product were available on the market. **Conclusion:** The study indicates that consumers are interested in chickpeas and probiotics, with a potential demand for plant-based foods containing probiotics.

Keywords: Consumer study. Word cloud. Healthy eating. Legume. Probiotic

Resumo

Introdução: A indústria de alimentos e os pesquisadores têm-se dedicado a desenvolver novos produtos funcionais, com características mais naturais. Assim, estudos que identifiquem a demanda dos consumidores buscando atender seus anseios são importantes. **Objetivo:** Avaliar o perfil e a percepção de consumidores sobre antepastos, probióticos e a intenção de compras de um antepasto de grão de bico adicionado de bactéria probiótica. **Método:** A avaliação foi realizada de forma online, por meio de questionário contendo 33 questões respondidas por 322 participantes. Nuvens de palavras foram elaboradas com os resultados obtidos. **Resultados:** A maioria dos participantes reside na Região Sudeste, 72,7% são do gênero feminino, 37,3% possuem renda familiar de até três salários mínimos, 75,8% sabem o que é antepasto e mais da metade já consumiu grão de bico e conhece seus benefícios. Mais de 84,0% dos participantes sabem o que são probióticos e 90,1% já consumiram produtos probióticos de base láctea. Entretanto, 78,0% demonstraram interesse por opções de produtos probióticos de origem vegetal. Sobre as

características que os participantes consideraram que melhor descrevem o antepasto, as mais citadas foram: pastoso, macio, agridoce, salgado e firme. A nuvem de palavras mostrou que os respondentes associam probióticos à saúde intestinal e 36% deles estariam dispostos a comprar antepasto de grão de bico contendo probiótico se o produto estivesse disponível no mercado. **Conclusão:** O estudo indica que os consumidores têm interesse por grão de bico e probióticos, havendo uma demanda potencial por alimentos de origem vegetal contendo probióticos.

Palavras-chave: Estudo com consumidor. Nuvem de palavras. Alimentação saudável. Leguminosa. Probiótico. .

INTRODUCTION

Functional foods have gained supporters in the country and in the world, for having, in addition to the function of nourishing, a metabolic and physiological effect for the maintenance of health, providing benefits to those who ingest them regularly.¹ In this context, researchers and the food industry have been working on the development of new products, in order to make them closer to nature, without chemical additives and less processed.

A portion of society is formed by different consumers, who have ideologies, customs, dietary restrictions, allergies or intolerance to some component found in the product. Among these consumers are those who are lactose intolerant and/or allergic to milk protein, in addition to vegans and vegetarians.²

This portion of the population does not ingest milk and derivatives and, consequently, does not consume probiotic products, since these are predominantly found in dairy products. Probiotics are live microorganisms that benefit the health of the host when consumed in appropriate amounts³ and, among their benefits, the relationship between health and intestinal regulation stands out. The Brazilian market is lacking in non-dairy probiotic products, with high demand for these foods by the population.

The Food Guide for the Brazilian Population presents a set of information on food that aims to promote the health of people, families and communities and of Brazilian society as a whole, today and in the future.⁴ This is in line with a healthy, nutritious and functional diet based on legumes, such as chickpeas, and products containing probiotic microorganisms.

Chickpea is rich in fiber, protein, minerals and vitamins, and has better digestibility compared to other legumes. In addition, it has high availability of iron, being identified as a food with high nutritional value,⁵ and can be used in the preparation of healthy salads, pasta and antipasti.

The consumer's view of food is fundamental. As a result, different methods have been applied to assess their perception of different foods, such as the word association technique, which is widely used because, through it, the consumer receives a stimulus and reports which words come to mind when receiving it. The researchers therefore obtain a wide range of words from the interviewee's vocabulary related to the product, which contributes to the development of the image that the product conveys to him.^{6,7}

Thus, this study aimed to evaluate the profile of consumers and their perception of antipasti and probiotics, and chickpea antipasti added with these microorganisms.

METHODS

The evaluation of the profile and perception of consumers about antipasto and probiotics and the purchase intention of chickpea antipasti added with probiotic bacteria were carried out online, by sending a questionnaire prepared in Google Form (<https://docs.google.com/forms>), through social networks such as WhatsApp, Facebook and email. Individuals from all over Brazil took part in the research, totaling 322 responses that were submitted to frequency analysis and represented in graphs, using the Microsoft Excel program. The questionnaire consisted of multiple-choice and discursive questions, with five questions about chickpeas, nine related to the perception of probiotic foods, eight about antipasti and four socioeconomic questions, among others about vegetable consumption, product price and consumers' quality of life, thus totaling 33 questions.

To analyze the perception of consumers participating in the research, they were presented with three questions that asked them to write what are the first words (descriptive words, sensations, feelings, etc.) that

come to mind when they think of: 1) Characteristics that they consider to best describe chickpeas; 2) Characteristics that they consider to best describe the appetizer; and 3) What are the main reasons that lead them to consume a probiotic food. Through the responses, word clouds were built for the most cited terms, using the R program.⁸

Ethical aspects

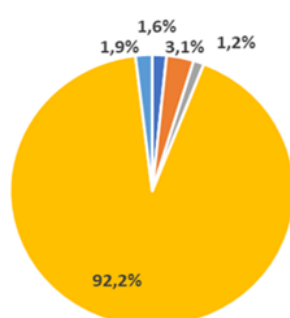
The project was approved by the Research Ethics Committee of the Federal Institute of Education, Science and Technology of Southeast Minas Gerais - IF SUDESTE - MG (CAAE: 51833821.3.0000.5588), meeting regulatory standards for research involving humans. Only those who signed the Free and Informed Consent Form (TCLE) participated in the study.

RESULTS AND DISCUSSION

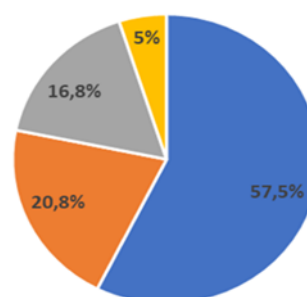
In this work, the profile of the participants was analyzed with the aim of getting to know potential consumers and understanding what they expected and/or associated with appetizers, probiotics and chickpeas. As for the socioeconomic characteristics of the participants (Figure 1A, 1B, 1C and 1D), it was found that most live in the Southeast Region (92.2%), are aged between 19-35 years (57.5%), are female (72.7%) and with salary range between R\$ 1,212.00 to 3,636.00 (37.3%).

Figure 1. Socioeconomic characterization of respondents. A) Distribution of respondents in the different regions of Brazil. B) Distribution of respondents by age group. C) Distribution of respondents by gender. D) Distribution of respondents by salary income. Data labels indicate number of respondents; Relative percentage.

A)



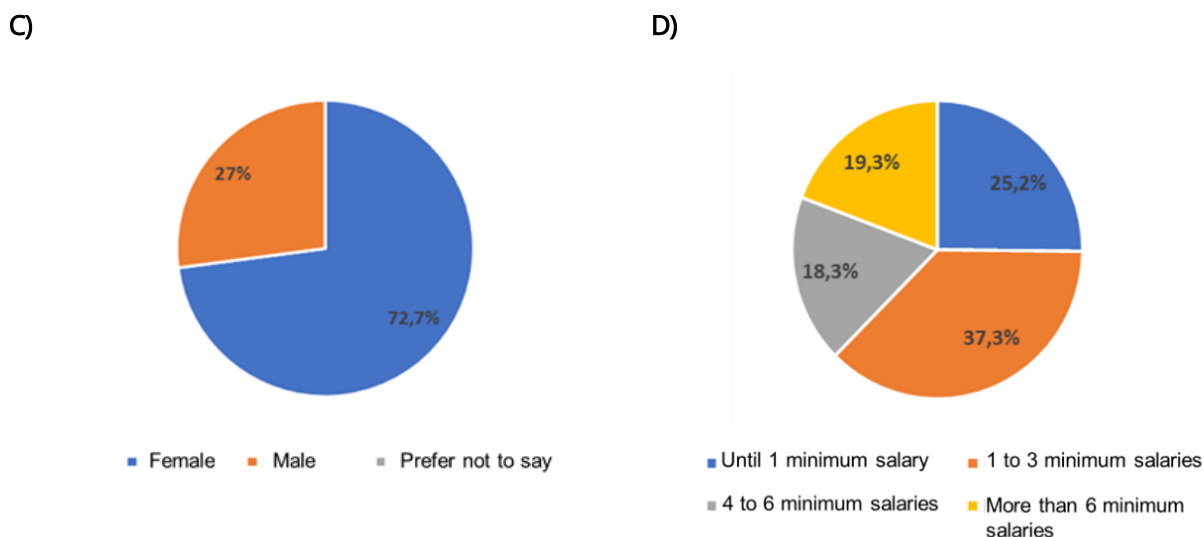
B)



■ North ■ Northeast ■ Midwest ■ Southeast ■ South

■ 19 to 35 years ■ 36 to 45 years ■ 46 to 60 years ■ Above 60 years

Figure 1. Socioeconomic characterization of respondents. A) Distribution of respondents in the different regions of Brazil. B) Distribution of respondents by age group. C) Distribution of respondents by gender. D) Distribution of respondents by salary income. Data labels indicate number of respondents; Relative percentage. Continues.



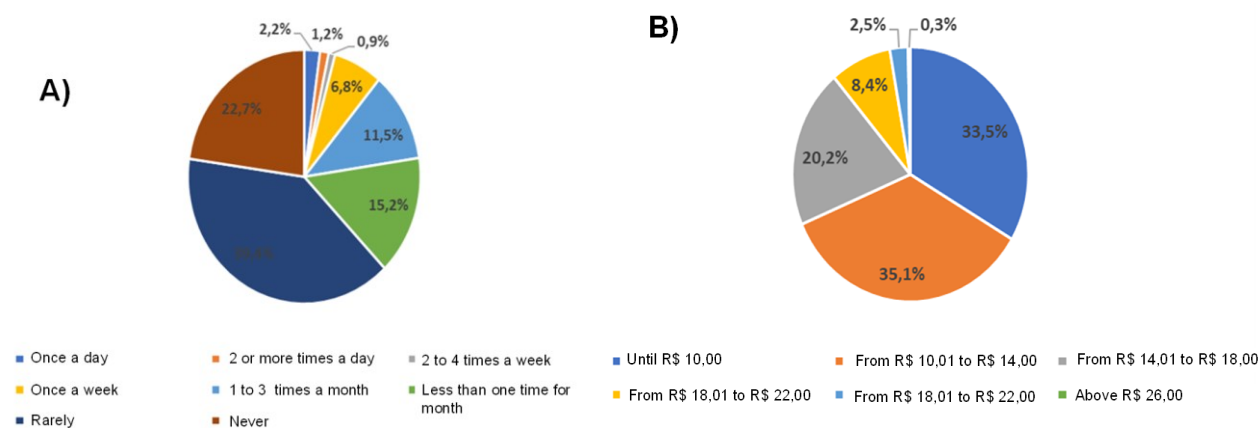
Source: Own elaboration.

The predominance of the younger age group may be related to the use of social networks, since the questionnaires were disseminated and shared in this medium. The prevalence of female responses may be associated with the fact that women are more interested in new products and in answering questionnaires involving food. Most participants, 84.8%, know what probiotics are. Knowledge of the term “probiotics” was also reported by 66% of participants in the Dias study.⁹ Probiotics have attracted the attention of the food industry to the development of new products, however, it is a challenge for the industry to assess how they should be introduced and compose industrial formulations.¹⁰

Among the respondents, 90.1% have already consumed some probiotic dairy product and only 1.0% of these have already consumed some probiotic product of vegetable origin. However, the majority of consumers, 78.0%, expressed interest in more plant-based probiotic product options, such as a probiotic appetizer.

It can be seen that most of the participants, 97.2%, consume vegetables and that less than half, 36.0%, consume them more than twice a week; 55.3% consume chickpeas and 22.7% consume them at least once a week (Figure 2A) and, in relation to the price, 35.1% said they were willing to pay between R\$ 10.00 to 14.00 per 160 g of the product with added probiotics (Figure 2B).

Figure 2. Respondents' profile regarding the frequency of chickpea consumption (A) and the amount they would be willing to pay for 160g of the product added with probiotics (B).



Source: Own elaboration.

In the study by Dias,⁹ 93.3% of the participants had already consumed probiotics through dairy products, indicating a higher consumption of dairy-based probiotics, which also corroborates another study¹¹ in which respondents habitually consumed fermented milk and had a preference for yogurt. Possibly, this consumer trend is due to the greater availability of probiotic dairy products on the market, due to the practicality of incorporation, survival and adaptation of these bacteria in this matrix. However, the participants are interested in a greater supply of probiotic products in vegetable matrix, since the number of vegans/vegetarians, lactose intolerant, allergic to milk proteins, hypercholesterolemic and consumers who do not like dairy products is significant, indicating a new niche to be explored.²

Most participants know and have already consumed eggplant (70.5%) and sun-dried tomato (41%) antipasto, which are the most available on the market. The high number of consumers who claimed to know the eggplant antipasto may be related to their social class and the search for “gourmet”, differentiated and practical products. Campos et al.¹² developed eggplant antipasto containing probiotics, and the intention to purchase the product by the participants ranged from “certainly would buy” to “probably would buy”, indicating its good acceptability, which is associated with what was verified in the present study for knowledge of the participants.

Figures 3A, 3B and 3C correspond to word clouds developed from the expressions most used by respondents who participated in the study. A difference can be observed between the size of the words, and the larger the word in the cloud, the more times it was highlighted by the respondents, which favors the visualization and interpretation of the data. Each respondent used at least one word to associate with the product, when asked “Which condiment(s) would you like to have in the chickpea appetizer?”, “Mark those characteristics that you consider best describe the appetizer” and “What are the main reasons that lead you to consume a probiotic food?”, respectively.

Figure 3. Word cloud associated with probiotic appetizer. A: Word cloud associated with the condiments you would like to be present in the product. B: Word cloud associated with the characteristics that best describe the appetizer. C: Word cloud associated with the main reasons for consuming a probiotic food.



Source: Own elaboration.

About the condiments that the participants would like to be present in the chickpea appetizer, the most cited words were: oregano (212); chives (195); parsley (163); olive (149); pepper (127); lemon pepper (116); cilantro (55); garlic (7) (Figure 3A). Olives and oregano are part of the composition of the elaborated product, which meets the wishes of the respondents.

For the characteristics they consider that best describe the antipasti, the most cited were: pasty (185); soft (138); bittersweet (128); salty (111); firm (40); liquid (7); candy (5) (Figure 3B). It was found that the expectation of the participants is achieved in the present study, since the chickpea appetizer has a consistent and pasty texture.

As for the main reasons that lead them to consume a probiotic food, the responses of the participants were segmented into intestinal functioning (213); health (212); quality of life (135); and nutritional quality (121) and taste (83) (Figure 3C). The option that contained intestinal functioning stood out with most responses, demonstrating that they relate probiotics to intestinal health and proving their knowledge about the action of these microorganisms.

Consumers consider the relationship between health and intestinal regulation as the main benefit of consuming probiotics.⁹ Sociodemographic factors, health status and knowledge about probiotic dairy products were assessed¹³ and researchers reported that 43.95% of respondents claimed to know about the

subject. This is consistent with another study carried out,¹⁴ which researched the consumer's attitude towards products containing probiotics and found that 53.41% of respondents consume them regularly. This fact indicates that such functionality of probiotics is well known among consumers.

Thus, based on the answers obtained in the questionnaire, antipasto can be an interesting and promising option for the development of a probiotic vegetable product, since society is increasingly informed about health and attentive to the consumption of foods that will bring benefits when ingested, thus leading the industry to develop new functional products. Furthermore, the architecture of some plant matrices becomes favorable for the growth of probiotics.

CONCLUSION

Most consumers know what probiotics are and there is a high consumption of these dairy-based products. However, there is consumer demand for more probiotic foods, such as plant-based foods.

The elaboration of a probiotic antipasto is viewed positively by consumers, who correlate the consumption of probiotics with health benefits, enhancing the elaboration of this new product and making it available on the market.

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Contributors

Barreiro NL, Antunes DJP and Eliane Martins EMF participated in the writing, preparation of the questionnaire and submission to the Research Ethics Committee. Condé PR and Talma SV participated in assisting in the writing of the article. Martins ML and Campos ANR participated in assisting in tabulating the results. Martins FO and Aurélia Dornelas de Oliveira Martins ADO participated in the review of the article.

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