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RESEARCH ON THE CONSUMER PERCEPTION OF DAIRY MILK VERSUS PLANT BASED ALTERNATIVES

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Abstract
Romanian consumers are open to new things, but the dairy market is highly competitive, with companies constantly looking for new products to attract customers. However, Romanian consumers are embracing this trend. This research aims to identify the direct and indirect factors influencing consumers' intentions to purchase and consume cow's milk versus plant-based alternatives. Data were collected online using Google Forms (n = 450), and a conventional sampling technique was employed to reach consumers. The study explores consumer behaviour towards dairy milk versus plant-based alternatives, focusing on purchase patterns, marketing, motivations for purchase, and the influence of socio-demographic factors. The results suggest that the nutritional and health benefits of milk and milk alternatives motivate consumers. 67% prefer milk, while 31% are open to plant-based alternatives — figures reflecting the current market size. In conclusion, Romanian consumers are open to new products, but intense promotion and attractive marketing strategies are needed to increase their intention to purchase dairy or alternative products.

Keywords: *diets, food choice, milk, plant-based.*

1. INTRODUCTION

Milk is a product of the mammary glands of mammals, and its presence in the human diet dates back to the beginning of the 7th millennium BC (Evershed et al., 2008). In contemporary diets, the most commonly consumed is cow's milk, as it is easy to process and tolerated by most consumers. Drinking milk can also come from goats, sheep, buffalo, camels, etc. The timeless consumption of milk and dairy products is due to the beneficial effects it has on the body (Kubicová et al., 2019; Sanjulián et al., 2025), being a food of high nutritional quality, recommended as a source of calcium, phosphorus, magnesium, potassium, proteins, fats and other essential compounds and with high bioavailability for the body. The benefits of milk consumption are well known, so, in addition to its influence on bone health, its positive impact on chronic-degenerative conditions, cardiometabolic diseases, certain types of cancer and neurodegenerative diseases is also promoted (Grosso, 2017; Willett et al., 2020).

Average milk consumption per capita varies widely. Thus, it is estimated that at a global level, the average milk consumption of adults is approximately 0.135 to 0.35 litres per day between 2019 and 2023 (Singh et al., 2015). At a global level, annual milk consumption can vary between 10 and 212 kg per person. These values can vary significantly between countries and continents. Extrapolating, per capita milk consumption in the European Union was approximately 52-53 kg per year in 2023 (EU: milk consumption per capita 2023 | Statista).

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The milk and dairy market is booming, but it is constantly adapting to consumers' preferences, who have changed their consumption behaviour in recent years. Therefore, concerns about health, environmental protection, sustainability and sustainable development have led companies to innovate new products to meet consumer needs; namely, more sustainable and healthy alternatives to conventional products. The future is auspicious for food operators as they can incorporate functional attributes into food and beverage products and offer products that meet individual dietary needs and requirements. Innovation provides solutions that enable plant protein to be used in finished products with greater success. Lactose-free protein products allow food developers to improve the nutritional profile of products by using other ingredients rich in good quality protein.
Plant-based milk accounted for a 67.6% share of global revenues in 2024. Health, environmental, and ethical factors drive the growing demand for plant-based milk in the dairy alternatives market. The growing ageing population has led to a preference for plant-based dairy alternatives in developed regions such as North America and Europe (Dairy Alternatives Market Size, Share | Industry Report, 2030). The increasing demand for low-calorie foods and the growing popularity of plant-based nutritional products are also expected to drive the demand for dairy-based dairy alternatives in the coming years (Dairy Alternatives Market Size, Share | Industry Report, 2030). Milk alternatives based on plants are based on plant ingredients and are obtained by breaking down extracted plant material in water and homogenising this liquid, which resembles milk in appearance. Depending on the plant material used, they are divided into five classes: nut-based (almonds, pistachios, coconut, etc.), legume-based (soybeans are the most common, peas, chickpeas), cereal-based (rice, oats, etc.), pseudocereal-based (quinoa, teff, etc.), and oilseed-based (sunflower, hemp, sesame) (Tangyu et al., 2019).

2. MATERIALS AND METHODS

Data on consumer perceptions of dairy products and vegetable alternatives were collected by completing a 24-question questionnaire by 450 respondents from Romania. The questionnaires were completed and uploaded to a Google Forms document. The study sample was selected to reflect the socio-demographic diversity of the investigated population and purchasing and consumption behaviour. In assessing the buying behaviour, a Likert Scale with 5 points (where 1 - not important, and 5 - very important). The Likert scale is commonly used to measure attitudes, knowledge, perceptions, values, and behavioural changes. This scale consists of a series of statements from which respondents can choose to rate their responses to evaluative questions (Brown, 2010; Vogt, 1999).

3. RESULTS AND DISCUSSIONS

This paper investigates consumer preferences and factors influencing consumer conversion from cow's milk to plant-based milk in Romania. 450 respondents participated in the study, and the data collected through questionnaires were graphically processed and presented for each item. The age distribution showed that 3.33% of the respondents were between 18 and 24 years old, 11.78% were between 25 and 34 years old, 54.22% were between 35 and 44 years old, 20.22% were between 45 and 54 years old, 8.44% were in the 55-64 age category, and 2.00% mentioned that they were over 65 years old.
Regarding gender ratio, the result shows that among the 450 respondents, women (76.67%) outnumbered men (23.33%). The educational level of the respondents varied: 4.6% stated that they

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had secondary education, 42.44% had high school education, and more than half of the respondents (52.89%) had a university education.
In terms of monthly income, 24.44% of the participants earned less than 3500 lei, 40.44% earned between 3501 and 5000 lei, about one-fifth (23.11%) had a net monthly income of 5001-7500 lei, and 12% had a net income over 7500 lei.
In terms of the respondents' place of residence, the results indicated that 70.89% of the participants were from urban areas, while 29.11% lived in rural areas.
Figure 1 shows the most important criteria for choosing where to buy food. The graph shows that food is most frequently purchased from the supermarket, so 266 respondents chose this option. 237 prefer to shop in grocery stores, 229 prefer to shop in specialised stores, and only 57 prefer online shopping/home delivery. Regarding the frequency of food purchases (Figure 2), 45% have the option "more than once a week", followed by daily, with 26% of respondents.

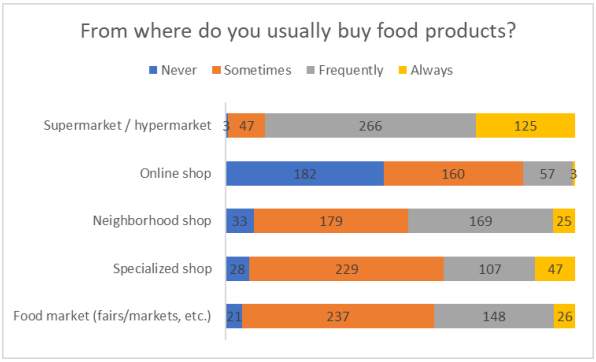

Figure 1. Criteria for choosing the place to buy food

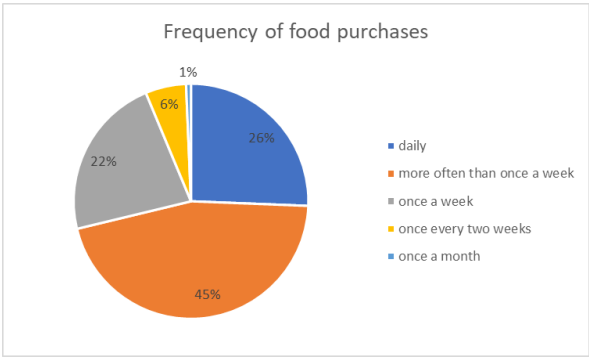

Figure 2. Frequency of food purchases

Regarding the factors influencing the purchase decision, respondents had to rate each predefined factor from 1 to 5 (Figure 3). The most important criterion was product quality (186 respondents gave it 5 points of importance); product experience was the second criterion, with 150 responses; attractive price was the third criterion in importance, with 144 responses, and promotions were the fourth option (with 113 responses). It is observed that the quality/price ratio and familiarity are essential in the food purchasing process. Price also has a significant impact on the purchase decision. Shelf positioning and brands that can accurately identify and respond to changes in consumer preferences are better positioned to meet consumer expectations. Consumer preferences are influenced by many factors, including lifestyles, life stages, social networks, economic conditions, and even packaging size.
The data is supported by the following question: "What factors influence your choice of food on the self?" (Figure 4). This question shows the evolution of today's consumer, who wants a quality product first and then decides based on price. At the shelf, familiarity and brand are essential in food purchasing.

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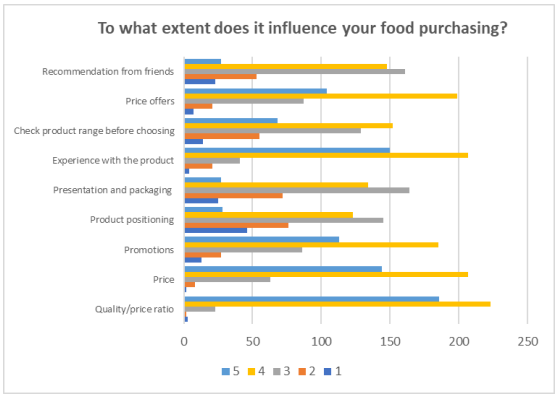

Figure 3. Factors that influence food purchasing

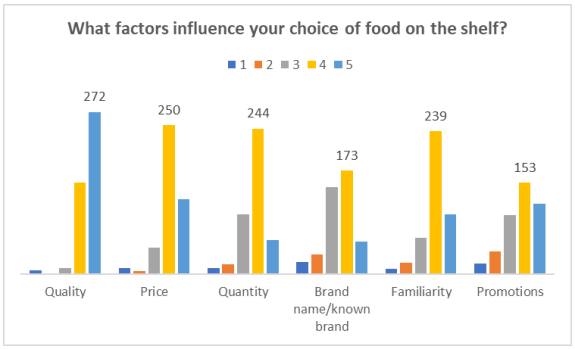

Figure 4. Factors influencing the choice of food on the shelf

The study aims to highlight the position of milk in consumers' preferences and their openness to plant-based products that can be an alternative to conventional milk. When asked "How often do you consume milk and dairy products?" people show a high preference for milk and dairy products in their daily diet (Figure 5, Figure 6). This is in line with statistical estimates. Thus, in 2023, the per capita consumption of milk products in the European Union (EU-27) was about 52.81 kilograms (www.ec.europa.eu/Eurostat). This is also reflected in the assortment of dairy products on the shelf.

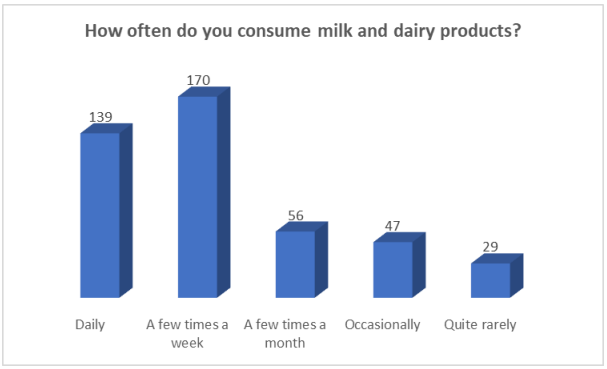

Figure 5. Frequently consumed milk and dairy milk

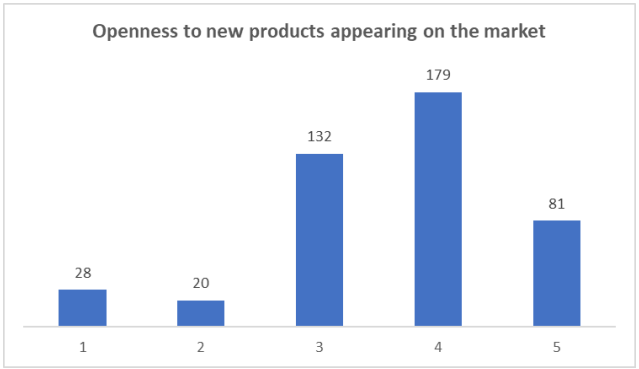

Figure 6. Openness to new products appearing on the market

Consumer preferences for new products are influenced by a combination of factors, including the perceived value of new features, brand loyalty, the general market situation and local environmental legislation trends (McCarthy et al., 2017; Sethi et al., 2016). Consumers often assume that new products are better, even with minimal improvements, and are likelier to choose them over older versions. In addition, buyers are increasingly open to new brands, actively looking for value for money, eco-labels, health benefits, and accurate product descriptions. They are also highly attentive to information on material quality, sustainability, carbon footprint, etc. The last preference items compare two market segments, often contrasting when making consumption choices: plant-based beverages and cow's milk.

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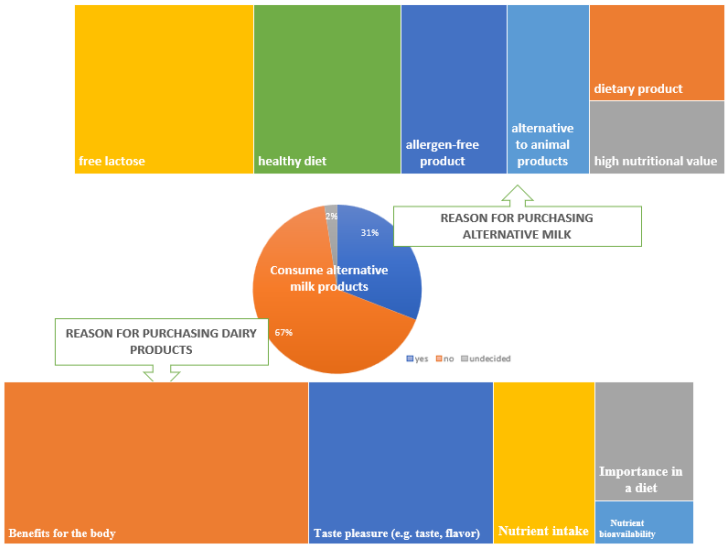

Figure 7. Consumer behaviour on milk consumption versus milk alternatives

Figure 7 highlights the answers to 3 questions: "Do you consume plant-based 'milk'?", "What are the benefits of consuming conventional milk?" and "What are the benefits of consuming milk alternatives?". It was found that 31% of respondents were very open to trying new products, such as plant-based alternatives to conventional milk, while 67% were somewhat open. The growth trend of the segment willing to buy and consume plant-based alternatives is increasing, which is supported by statistical data. According to www.statista.com, it was estimated that in 2023, retail sales generated approximately 3.8 billion US dollars in Europe. The central region for plant-based milk retail sales was the Asia-Pacific region, which more than doubled the retail sales of European operators (https://www.statista.com). The beliefs of those who consume milk are extremely well-founded; 323 respondents mentioned that drinking milk benefits the body, 196 respondents appreciated the taste pleasure, and 107 respondents mentioned the nutritional values. Regarding plant-based milk alternatives, 200 respondents mentioned that these products are lactose-free, have low allergenic potential (118 respondents) and are recommended for a balanced and healthy diet (165 respondents). Analysing Figure 7, we observe that consumers' different opinions about these two types of products are related to various factors (e.g., health, animal welfare, environmental impact, and sustainability), lifestyles (e.g., vegetarian and vegan), and familiarity (taste, experience, and habit) that may influence acceptance, perception, and motivation to consume the product (Rasika et al., 2021; Reyes-Jurado et al., 2021; Sottile et al., 2023).

When asked, "What types of milk do they frequently prefer?" when drinking milk, they have cow's milk, followed by goat's milk, which has gained ground in the market due to its benefits. As for alternative "milks", in first place in the preferences of Romanian consumers are soy milk, almond milk (sweetened or unsweetened), oat milk, rice milk and coconut milk, as well as other types of alternatives, but in a reduced proportion.

The changing consumption profile of dairy products can be observed in the decreasing milk consumption of the young generation, for whom food choices are influenced by factors such as health, lifestyle, sustainability and ethics. Over time, the dairy industry has responded to this demand by offering lactose-free options, organic milk, dairy products with added plant protein and even dairy products made with lab-grown protein to appeal to younger consumers. However, plant-

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based "milk" has become mainstream recently, and the young generation has slowly embraced it. The new generation's openness to these hybrid products (milk with added plant ingredients or milk alternatives) shows a greater awareness of what they consume and their impact on health, lifestyle, environment, and animal welfare. As a result, more and more young people are turning to plant-based alternatives that align with their ethical values.

Increasing cases of allergies and intolerances among the population have led to a change in the dynamics of preferences for dairy consumption.

Lactose intolerance is a clinical syndrome that manifests with characteristic signs and symptoms when consuming foods containing lactose, a disaccharide. The severity of the disease varies from individual to individual and is called lactose malabsorption. Many people avoid milk when diagnosed or want to avoid this inconvenience. This leads to consuming special, lactose-free products, considerably reducing the healthcare burden (Malik & Panuganti, 2023).

Another problem that is of real danger is milk protein allergy, which limits milk consumption. It is often outgrown by the age of five. However, 15–20% of allergic children become permanently allergic, with elevated levels of immunoglobulin E (IgE) and, in particular, IgE specific to cow's milk (Williams et al., 2023; Monaci et al., 2006; Flom et al., 2019). Cow's milk allergy is often the first food allergy to develop in a young infant and often precedes the development of allergies to other foods, such as eggs and nuts (Emmert et al., 2023).

Plant-based alternatives are at the top of preferences in recent years, especially in large urban areas, and they are essentially used as a healthy alternative to conventional milk. However, each plant ingredient used as the basis for obtaining an alternative to milk products may present a series of particularities that must be considered. Thus, nut-based drinks may have a high allergenicity and must also be marked with allergens accordingly. Similarly, cereals present allergenicity through their protein content, protein substances of a gluten nature that can be a problem for people with gluten intolerance. Legumes such as soy, through their high content of phytoestrogens, etc., but consumed responsibly, soy isoflavones can reduce the risk of breast cancer in pre-menopausal and post-menopausal women (Boutas et al., 2022).

The conventional or alternative milk must be chosen according to each person's health profile, religious and cultural beliefs, and lifestyle. Pursuing healthier lifestyles has been a significant catalyst for the growth of plant-based alternative milk. As more people focus on healthier lifestyles, consumers become more conscious of the potential health risks associated with their consumption habits. Instead, many are shifting to functional beverages: fortified with vitamins, minerals, probiotics, or other health-boosting ingredients.

4. CONCLUSIONS

The main information from the questionnaire analysis is that gender, monthly income level, and health status influence actual purchasing behaviour. Economic status does not condition the choice of the type of milk (conventional or alternative) but rather various benefits, including potential health improvements, environmental impact, and ethical considerations regarding animal welfare.

Changing consumption patterns, active lifestyles, demand for new products and ingredients, and, last but not least, convenience contribute to the market's growth. Due to the demand of consumers with an active lifestyle, new product categories will increase, such as high-protein dairy products or plant-based alternative products. All this will lead to diversifying the assortment of dairy products or alternatives to milk, and the industry will reinvent itself through market changes and consumer

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preferences. There is also a greater openness to investigating other new products to substitute conventional ones.

The results of this study provide market operators and marketers with an overall picture of how sociodemographic factors, health issues, and environmental concerns associated with dairy consumption may influence consumers' positioning towards these products and their actual purchasing behaviour.

5. ACKNOWLEDGEMENTS

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