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**CONSUMER BEHAVIOR WHEN PURCHASING PLANT-BASED  
MILK ALTERNATIVES**

Bachelor's thesis

International business administration, specialisation Marketing

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I hereby declare that I have compiled the paper independently and all works, important standpoints and data by other authors has been properly referenced and the same paper has not been previously presented for grading.

The document length is 8240 words from the introduction to the end of conclusion.

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## **ABSTRACT**

The problem of this thesis is the lack of knowledge about the buying behavior and motives when consuming plant-based milk alternatives. Due to the problem, the aim of the thesis is to determine the main reasons why people choose plant-based milk alternatives and what are the driving factors that influence the plant-based milk alternatives buying behavior of people in Estonia. To collect information regarding the buying behavior and motives when consuming plant-based milk alternatives, the author of this thesis uses a quantitative research method and carries out a survey.

When buying plant-based milk alternatives, people find their previous experience as the most important factor. People also find the ingredients of a plant-based milk alternative very important. The respondents find the fact that consuming plant-based milk alternatives helps animal welfare most important. People also find that plant-based milk alternatives are good for their health. In addition, plant-based milk alternatives make the respondents feel good and they mostly think that plant-based milk alternatives taste better than regular milk. People think that the prices should be cheaper and there should be more unsweetened versions of plant-based milk alternatives. In addition, many people want to consume plant-based milk alternatives that consist of fewer artificial substances and food additives.

The author of this thesis believes that the results along with the recommendations made by the respondents give a brief overview to manufacturers and marketers concerning the matter of the motives, factors and buying behavior of plant-based milk alternatives.

Key words: plant-based milk alternatives, motives, factors, buying behavior

## **INTRODUCTION**

Healthy and active lifestyles are being promoted more and more. People are willing to try all sorts of diets or are trying to lose weight. Others have chosen to abandon foods that are anyhow related to animals. Some people have specific health issues that limit their food choice. In this graduation thesis the author is investigating the motives and factors influencing plant-based milk alternatives consumption. This topic was chosen because of the author's strong interest in nutrition and healthy lifestyle. The author has been engaged in educating herself in the field of nutrition for the past few years and is interested in various aspects that influence people to make different decisions when making food choices.

The problem of this thesis is the lack of knowledge about the buying behavior and motives when consuming plant-based milk alternatives. Due to the problem, the aim of the thesis is to determine the main reasons why people choose plant-based milk alternatives and what are the driving factors that influence the plant-based milk alternatives buying behavior of people in Estonia. To identify and target the consumers of plant-based milk alternatives, we need to understand the motives and factors which affect their outlook. This helps to understand the most important considerations which shape the behavior of plant-based milk alternatives consumers. Moreover, it provides a detailed analytical framework for the reasons, which cause change in attitude of consumers towards plant-based milk alternatives.

To collect information regarding the buying behavior and motives when consuming plant-based milk alternatives, the author of this thesis used a quantitative research method and conducted a survey. The survey mainly focused on the consuming habits, motives and taste preferences of plant-based milk alternatives. The author mainly distributed the survey via Facebook, posting it to various groups. Google Forms platform was used to conduct the survey and Microsoft Excel to analyse the results. A total of 352 people filled out the survey.

This thesis is divided into three chapters. The first chapter focuses on the nature of consumer behavior, motives and factors that influence consumer behavior. The second chapter gives an overview of the plant-based milk alternatives. The author gives an overview of different types of plant-based milk alternatives, reasons for choosing plant-based milk alternatives and food trends on the current market. The third chapter focuses on the quantitative research of the buying behavior and motives regarding plant-based milk alternatives and is divided into three subchapters. The first subchapter explains the method of the research. The second subchapter gives an overview of the results of the survey. The third subchapter focuses on the discussion and recommendations.

# **1. THEORETICAL ASPECTS OF CONSUMER BEHAVIOR**

This chapter focuses on the nature of consumer behavior, the purchase decision process, motives and other factors that influence consumer's buying behavior.

## **1.1. Consumer behavior and purchase decision process**

Every customer is extremely valuable to marketers. Every customer is unique, for example one might have a lot of money but little time, whereas the other person may have a lot of time but little money. Every customer needs to be viewed as an individual and to come out as a winner in this strong marketing competition it is extremely important for marketers to understand the key aspects of consumer behavior. Successful marketing decisions require a high knowledge about consumer behavior. If a company wants to be successful in this ever-changing environment, it needs to understand and learn to predict consumer behavior. (Hawkins, Mothersbaugh 2013, 21)

Consumer is any individual who buys products for his personal use. Consumer does not buy products or services for manufacturing or reselling. A consumer is the one who makes the last decision whether to buy or not to buy an item from the shop. (Nair 2009, 6)

Every one of us is a buyer and consumer, this is a part of our lifestyle and well-being (Engel *et al.* 1990, 3). Consumer behavior can be defined as actions that are directly involved in obtaining, consuming, and disposing of products and services. Consumer behavior includes also the decision processes that forego and come after these actions. During the various stages of purchasing behavior, the collection and consideration of information and the final decision are made according to the wishes and needs of the consumer. The subsequent assessment of the purchase decision may lead to repurchase. (Foxall *et al.* 1998, 27)

The consumer purchasing process begins before the decision is made and continues after the purchase (Figure 1). The marketer has to understand the consumer behavior in the process as a whole and at different stages of it and find effective measures for each stage.



Figure 1. Consumer's purchase decision process

Source: Composed by the author based on Kotler, Keller (2006, 191)

The first stimuli of any purchase decision is a customer's need for something. Consumers do not just buy things because they have extra money. They sense a need of a particular product and they believe that it can solve their problem or that it satisfies their need. Often, the need for certain circumstances cannot be satisfied immediately. (Blackwell *et al.* 2006, 71)

After need recognition the customer begins to look for important information to satisfy their need. Often the consumer needs additional information before making the final decision. In a situation where the consumer feels that he or she does not have enough information about the product or service, the consumer starts looking for information from different sources. One can turn to their previous experiences as seen ads or listen to other's recommendations. The time to search for information can depend on the purchase price of the one recognizes need for. (Schiffman, Kanuk 2007, 533)

Gathering information provides the brands that the consumer takes into consideration when making a purchasing decision and satisfying their unmet needs. Search may be internal (memory based, genetic tendencies) or external (collecting information from family, friends, marketers), The consumer uses

the evaluation criteria to select a suitable alternative amongst the alternatives. The rating criteria may be price, brand awareness, comfort, appearance, warranty, etc. The length of the search depends on the customer individually. It depends on variables such as personality, social class, income, size of purchase and past experiences. Valuation criteria varies depending on the product. There are products that consider many criteria and some of them are also very important. (Blackwell *et al.* 2006, 74-75)

When making a purchase decision, the consumer chooses the appropriate product and the appropriate retailer and place of purchase (shop, e-shop, catalogue, etc.). The role of a retailer is to make the purchase as convenient as possible for the consumer, sometimes the consumer can buy something quite different from what they wanted to buy at first. This can happen thanks to the salesperson, product displays, electronic media, point-of-purchase advertising, etc. (*Ibid.*, 81-82)

After the purchase, the buyer evaluates his choice. Satisfaction is expressed by the consumer's feeling. After the purchase, the buyer is either satisfied or unhappy. Consumers are happy if the products meet their needs. If the product does not meet their expectations they express dissatisfaction. If a buyer is satisfied with his purchase, he is more likely to buy the same product from the same manufacturer next time. Some purchases lead to internal disagreements after the purchase, which means that the consumer may doubt the correctness of his purchase. The customer satisfaction evaluation should be done by the company on a regular basis. (Kotler, Amstrong 2011, 154)

## **1.2. Factors influencing consumer's buying behavior**

There are a lot of factors that can influence one's buying behavior. Buying behavior can be influenced by personal factors, psychological factors, social factors, cultural factors, etc.

To begin with, **age** affects people's needs, interests, tastes, preferences and purchasing power. In terms of age, both needs and opportunities change. The age of a consumer is highly related to their purchase decisions. Consumer buys different products at different life stages. (Kotler, Amstrong 2011, 145)

When looking at consumer behavior an important factor that should be taken into consideration is **gender**. Several products or services are targeted at men or women. Segmenting consumers by gender

starts at an early stage of life. Men and women can also have a different taste. (Solomon 2006, 10)

The purchase made by the consumer is significantly influenced by their **income**. If there is a desire and an income; the consumer can make purchasing decisions. In terms of the income, different consumers meet the needs in different price categories. Depending on the income, the consumer prefers either quality or price. (*Ibid.*, 438-439)

People in one **social class** have a similar social position, attitudes, values, language style and wealth. Often, the social class depends on what kind of clothes or furniture is bought, how free time is spent, what media is being monitored, how the money is spent and how the money is saved. (*Ibid.*, 439-440)

**Family members** can also have an impact on the purchase decision. Many products are purchased by a family unit. For example, milk products are often purchased by an individual family member but consumed usually by all family members. Many purchases depend on the opinion of the family parent-food, clothing, apartment, cosmetics, etc. Depending on the product category, children can also be affected by the purchase. (Hawkins et al. 2001, 206-207)

A **reference group** is a group of people who have a direct or indirect influence on a person's views and behavior. An individual identifies himself/herself as a reference group, takes over its values, attitudes and behavior (Solomon *et al.* 2006, 350). An **opinion leader** is an individual who, through the knowledge or competence of a particular product, affects a potential consumer. The influence of the opinion leader is greater if the opinion leader and the consumer have the same background and attitudes. In marketing, celebrities and experts, as well as people from the public are used as opinion leaders. (Solomon *et al.* 2006, 374-375)

One of the most common psychological factor that can influence consumer purchasing behavior is **learning**. Learning is the key to consumer's motivation and perception. Learning is a change in the behavior of an individual, based on experience learning behavior is also influenced by information provided by other people or factors. Learning influences a person's behavior and opinion to a large extent. Our behavior is influenced by the learning process and new experiences. (Kotler, Amstrong 2011, 149)

Another psychological factor is the **attitude**. Every single person has their specific opinions and own attitude. A person has attitudes towards other people, statements, products or services. Many different kinds of interactions or experiences can shape a person's attitude. The attitude is the willingness to react in a particular way to a particular object or to a particular situation. Attitude impacts consumer behavior strongly, it shapes a person's opinion about what they want to buy and what they will rather avoid. (Solomon *et al.* 2006, 138-139)

### **1.3. The needs and motives**

Needs and motives affect a person's feelings and emotions. For example, a person who is hungry perceives negative emotions before eating but positive emotions after eating. Therefore, the need is satisfied. (Hawkins, Mothersbaugh 2013, 352)

The need creates a certain stress state for the consumer, which forces the consumer to try to eliminate or reduce the feeling. This particular need may be practical, resulting in practical benefits for the consumer, or emotional, resulting in consumer satisfaction. A motive is the leading force that makes people behave. (Schiffman, Wisenblit 2015, 82)

The motives are motivated by rational and emotional needs. This means that the motives of the purchase can be either rational for consumers (price, reliability, etc.) or emotional (beauty, reputation, etc.). (Rada 1999, 27-28)

In the case of an emotional purchase, the consumer makes the purchase without longer analysis. Contrary to the emotional buyer, a rational buyer makes his choices purposefully and has already planned his purchases before going to the store. A rational buyer buys customary and well-known products. Rational buyers tend to be more economical. Rational consumer compares the prices of the desired products and selects the lowest price product among the suitable products. (Kenk 2013)

Motivation is an activity or a process in which a person acquires a motive to perform an activity. In most cases, motivation results from needs that lead to consumer effort to try to reduce or satisfy the

need. Consumer can have a utilitarian (a desire to achieve some functional or practical benefit) or hedonic (an experiential need, involving emotional responses or fantasies) need. If the consumer satisfies the need and meets the goal, it will offer the consumer satisfaction and lead to a state of well-being. Motivation is the basis for all human activities. (Solomon *et al.* 2006, 90)

To satisfy an individual's biological needs (pain, hunger, thirst, etc.), there are physiological motives. Psychological motives (the need for achievement and status) are for satisfying physiological needs. Often, the consumer can meet physiological and psychogenic needs at the same time. It is believed that psychological motives dominate over physiological motives (Loudon, Bitta 1993, 326). The motives influence the process of handling information, which in turn affects how we interpret the surrounding environment. At the fundamental level, the motives influence the consumer's learning ability, attitudes, personality and how they interpret the information. (*Ibid.*, 325)

Throughout the years there have been many studies in consumer behavior regarding the motives. For example, the Department of Food Engineering in University of Zagreb (Croatia) carried out a pilot study on examining the purchasing behavior, buying motives and consumption patterns for selection of dairy beverages (Krešić *et al.* 2010, 50). The study included 114 participants who were interviewed at the entrances of five shopping centres in cities Rijeka and Opatija (both located in Kvarner region of Croatia). The interviews lasted 10 minutes and were conducted by trained interviewers. The authors' goal of the research was to get insights which products the interviewees usually consume, when they consume it, why they usually purchase it and what motivates them to buy the product (*Ibid.*, 51). The results showed that females consume more milk and milk drinks than men. Approximately 17% of females and 7% of males regularly consume fermented milk drinks. Dairy drinks are often consumed during breakfast, although a high percentage of men prefer it as a snack. Male participants also showed a higher level of loyalty to certain products. When failing in finding the product they wanted, the male participants would desist from purchasing whereas 45,7% of females would still buy the product but from a different manufacturer (*Ibid.*, 54). Motivation wise the results indicate that sensory appeal was the most important motivational factor for both genders. Ranked second amongst males was brand and amongst females health aspects. About 40% of those who thought that health aspects are important where at least 45 years old which shows that as people are getting older, the more the health concerns rise. For both genders product origin was in third place. The factor that the

consumers were least worried about was the natural content/naturalness of dairy beverages. (Krešić *et al.* 2010, 56)

Nguyen Tien Thong and Hans Stubbe Solgaard carried out a research “Consumer’s food motives and seafood consumption” to investigate patterns between one’s personal factors and the consumption of three seafood products (fish, shrimp and mussels). The authors conducted a survey with a sample size of 996 French people. The motives of the respondents’ food choices were measured on 27 items, which were categorized into 9 motivational factors- health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, ethical concern (Thong, Solgaard 2016, 182). The frequency of the previously mentioned seafood products was measured with the question “How often do you eat any of the following types of food?”. According to the results, the most important motives concerning the seafood consumption were convenience and weight control. Weight was found to be a positive driver and convenience a barrier when consuming the three seafood products (*Ibid.*, 185). For fish and shrimp consumption, price concern and household income were the main barriers for consumption, especially amongst low income and female consumers (*Ibid.*, 186). Ethical concern was not a major determinant of seafood consumption, which the authors related with the fact that nowadays seafood is supplied from different sources (domestic and importing) and in various packaging forms. (*Ibid.*, 187)

Yu-Hua Christine Sun carried out a research on the impact of food choice motives and attitudes towards healthy eating, where 500 undergraduate students were investigated. The results showed that variables such as demographics, health concerns, attitudes toward healthy eating and food choice motive factors were significantly correlated (Sun 2008, 45). Many respondents were concerned about consuming too many calories and it had a huge impact on consumers’ healthy eating attitude. This showed that these people influenced directly their healthy eating attitude and indirectly their food choice motive. (*Ibid.*, 46)

## **2. AN OVERVIEW OF THE PLANT-BASED MILK ALTERNATIVES**

This chapter gives a brief overview of the plant-based milk alternatives' market, introduces different kind of plant-based milk alternatives and reasons for choosing plant-based milk alternatives.

### **2.1. Reasons for choosing plant-based milk alternatives**

Recent nutritional and purchasing trends affect the consumer's food choices and purchasing patterns, and companies need to keep up with it. The increasing consumer's awareness about health and healthy foods is forcing companies to come out with new healthier products or substitutes, so called functional foods (Vicentini *et al.* 2016, 340). These foods are known for their ability to prevent nutrition related diseases, increase physical and mental well-being of consumers, in summary these foods provide additional benefits to consumers. As consumers are concerned about their health and are increasingly looking for products that will have a positive impact on their health and tend to buy products that claim to support and improve their well-being (*Ibid.*, 339). Plant-based milk alternatives can be viewed as a one of those functional foods due to their benefits to the consumer.

Many people suffer from lactose intolerance. This is a common digestive problem. A person who suffers from lactose intolerance is unable to digest lactose. Milk and dairy products contain a type of sugar which is so called lactose. The symptoms of lactose intolerance can be cramps, bloating, flatulence and diarrhea (Lactose ... 2019). Nowadays lactose-free products are available in most stores.

Additionally, some people are allergic to protein that can be found in cow's milk. The symptoms can include cutaneous reactions with urticarial and edema, respiratory episodes, anaphylaxis, and gastrointestinal distress including vomiting, diarrhea, and bloody stools. (Vandenplas *et al.* 2007, 902)

Thanks to the increased choice of plant-based milk alternatives people do not have to consider only the taste, texture or other sensory attributes of non-dairy milks, but consumers can also compare their nutritional value and the impact they have on health compared to cow's milk (Parrish 2018, 20-21). The nutritional values can vary highly, depending strongly on the raw material, manufacturing, vitamins added or other ingredients such as sweeteners or fats/oils. (Mäkinen *et al.* 2015, 343)

One of the reasons is also animal welfare. Dairy cows, sensitive animals, live their short lives in very stressful conditions. Like all other mammals, cows must be pregnant to produce milk. The life of dairy cows therefore passes through a constant pregnancy which is achieved through regular forced evocation, causing physical discomfort and psychological stress to the animals. The animal industry is one of the biggest greenhouse gas generators which, in turn, contributes to climate warming and the global environmental crisis. (Tallinnas ... 2018)

Xiufeng Li and Yazhi Xin carried out a research “Factors Influencing Organic Food Purchase of Young Chinese Consumers” to determine the main factors that can influence organic food purchase behaviors among young Chinese consumers (Li, Xin 2015, 4). The authors conducted a survey with a sample size of 309 Chinese people. The research results showed that variables such as health, taste, environmental consciousness, animal welfare concerns and a positive feeling influence consumer’s intention to buy specific products. (*Ibid.*, 19)

Melissa R. Gresser carried out a research to determine the consumption of dairy and dairy alternatives and the perceptions of dairy in college students (Gresser 2015, 6). The sample included students who were enrolled in courses of Kent State University. The students were asked to answer to an online survey that consisted of three sections. Totalling 44 questions, the survey would typically take 10 to 15 minutes to complete (*Ibid.*, 50-51). The results showed that 29,6% of the respondents were consuming dairy alternative products (*Ibid.*, 73). The most common reason for consumption of dairy alternative products was the taste and the majority that consumed dairy alternatives consumed fortified versions of the dairy alternative (*Ibid.*, 60-61). The most common type of dairy alternative was almond milk (*Ibid.*, 61). Gender, living situation, and academic status did not have significant differences in the frequency of consumption of dairy alternatives. (*Ibid.*, 64-65)

Additionally, one of the main reasons for choosing plant-based milk alternatives may be due to a particular diet. Vegans, vegetarians, flexitarians and omnivores are individuals who follow a specific diet. These diets are the most common nowadays.

A person who follows a **vegan** diet does not consume dairy, eggs, meat or any other products of animal origin. Vegans choose to avoid all sorts of products that are anyhow related to animals for different reasons. These reasons can be ethical, health reasons or for the environment. **Vegetarians** eliminate from their diet fish, chicken and meat but they do consume dairy, eggs and honey. Some vegetarians also avoid gelatine. **Lacto-vegetarians** avoid fish, chicken, meat, eggs but still consume dairy. In contrast to lacto-vegetarian, **ovo-vegetarians** consume eggs but avoid dairy, fish, meat and chicken (Kes ... 2019). **Flexitarian** or **semi-vegetarian** is an individual who deliberately has increased their plant-based food intake but occasionally eats also meat. This diet is a good choice for an individual who wishes to follow a vegetarian diet but in a more flexible way. **Omnivore** is an individual who consumes both animal- and plant-based products on a regular basis. (Forestell 2018, 1)

## 2.2. The market and types of plant-based milk alternatives

Although there are no definite classifications of plant-based milk alternatives in the literature, the author's of "Plant-based milk alternatives an emerging segment of functional beverages: a review" classified the alternatives into five different categories (Sethi *et al.* 2016, 3409):

- Cereal based alternatives: oat milk, rice milk, corn milk, spelt milk.
- Legume based alternatives: soy milk, peanut milk, lupine milk, cowpea milk.
- Nut based alternatives: almond milk, coconut milk, hazelnut milk, pistachio milk, walnut milk.
- Seed based alternatives: sesame milk, flax milk, hemp milk, sunflower milk.
- Pseudo-cereal based alternatives: quinoa milk, teff milk, amaranth milk.

As seen above, there are many different kinds of milk alternatives available on the market. However, the author decided to go more into details with following plant-based milk alternatives: almond milk, cashew milk, coconut milk, oat milk, rice milk and soy milk.

**Almond milk** is made from ground almonds and water, it has a creamy texture and a strong nutty flavour. It does not contain lactose or cholesterol. Most almond milks are enriched with vitamins, minerals or protein. Almond milk is nutritious, low in calories, dairy free, high in fiber, enriched almond milk products can strengthen bones and may reduce the risk of heart diseases. Almond milk has been used as a cow milk substitute for years. It is easily available in most of the grocery stores. As almonds contain extra nutrients, it is often recommended for those who do not consume cow milk or for people who are vegans. There are also unsweetened almond milk varieties (in the market), which is a good choice for a person who wants a sugar-free milk alternative. (Arnason 2017)

**Cashew milk** is made from whole cashews and water. It is not milk-like white colour, but rather greyish. It has a creamy texture with the characteristic Indian nut flavour. It is loaded with vitamins, minerals, healthy fats. Besides nutrition benefits cashew milk has several health benefits. It may boost heart health, improve blood sugar control, have anticancer effects, boost immune health, improve iron-deficiency anemia and may aid blood clotting. Cashew milk is also good for skin and good for eye health. Cashew milk is available also in unsweetened versions. The calories per serving can vary depending on the manufacturer. Cow's milk can be replaced with cashew milk in many recipes. (Streit 2019)

**Coconut milk** is made from the white flesh that is inside the coconut. It is made in thick and thin variations. Thick coconut milk contains more fat than the thin coconut milk. Coconut milk is a very calorie rich food due to its high level saturated fat content. Also it is usually enriched with vitamins and minerals. Coconut milk protein content is lower than in cow's milk. According to researches done in previous years, coconut milk can help to lose weight, may reduce the risk of heart diseases and boost the immune system. The nutritional value and calories per serving vary depending on the manufacturer. There are different variations of coconut milk available in super markets. Coconut milk comes in cans and cartons. Canned coconut milk is thicker and is more often used for cooking, but coconut milk beverages are thin and are more likely used as a milk substitute. (Eske 2018)

**Oat milk** is made when steel cut oats are allowed to soak in water or whole groats in water after some period of time the mixture is blended and then strained. Oat milk is high in nutrients, including fiber. It is often fortified with vitamins and minerals. It is low in protein as many other plant-based milk alternatives. In fact, oat milk has more calories, carbs and fiber than almond, soy and cow's milk. Studies show that oat milk has several health benefits. It is vegan, naturally free of lactose and nuts. It may also increase bone strength. (Raman 2019)

**Rice milk** is a milk that is made with boiled rice and brown rice starch. It is lactose free so it is suitable for people with lactose intolerance. Rice milk flavour is not attractive for many people so manufactures often use sweeteners to make it taste more like cow's milk. Rice milk is low in calories and is usually enriched with vitamins and calcium-fortified. It's the least likely of all of plant-based milk alternative products to cause allergies. (Parrish 2018, 22)

**Soy milk** is made by soaking, crushing, cooking and straining soybeans. It is rich in proteins, as it is the only plant-based milk alternative, which contains as much as protein as cow's milk. It is an important source of protein especially when following a vegetarian diet. Soy milk is often enriched with vitamins and minerals (*Ibid*). The cons of soy milk are that it is a very common allergen. A 2008 Oxford study showed that higher intakes of soy-based foods caused fertility problems and lower sperm counts. (Chavarro *et al.* 2008, 2584)

Dairy alternatives industry is highly fragmented and in order to be successful in this strong competition, companies aggressively promote their products. As dairy alternative products have low alternative costs, it is easy for consumers to buy products from different manufactures, which in turn makes manufactures life more difficult and the rivalry is automatically increased. This in turn forces manufacturers to think about product innovation. Furthermore, manufacturers can develop the plant-based milk alternatives segment in the coming years due to population growth and increasing disposable income. (Dairy alternatives market size ... 2019)

Figure 2 shows the dairy alternative market by different regions (Asia Pacific, North America, Europe and rest of the world).

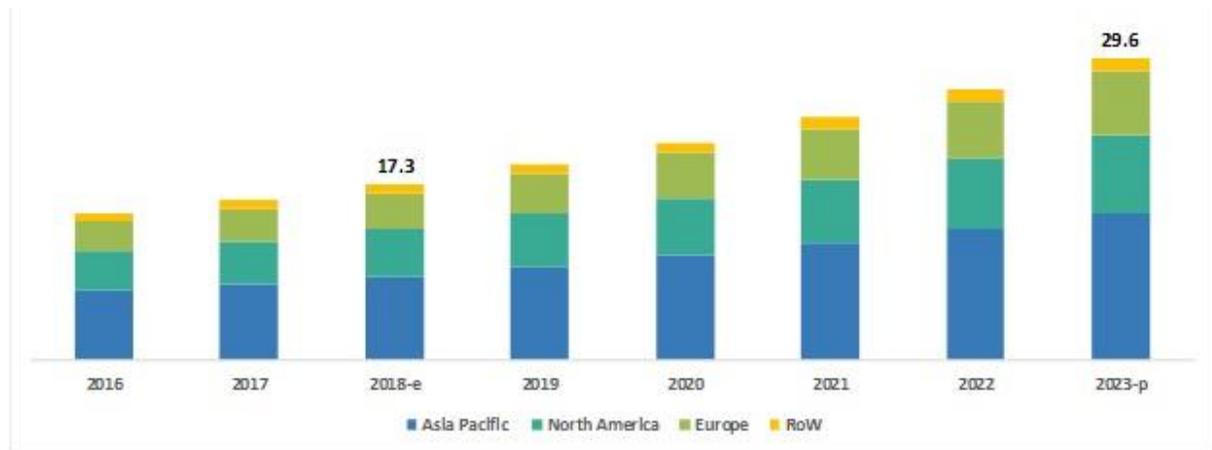


Figure 2. Dairy alternative market, by region (USD billion)  
 Source: (Dairy alternatives market by source ... 2019)

In terms of region, the Asia Pacific is estimated to have the largest market share by 2023, in addition, the Asia Pacific also had the largest market share in 2018. There are several factors behind this growth. Growth is driven by increased incomes, people are more concerned about their health and physical fitness, so consumers are looking for healthier products, which in turn increases the demand for healthy products. In the Asia Pacific the marked growth is strongly influenced by the speedy urbanization, diet diversification and liberalization of foreign direct financing in the food sector. (Dairy alternatives market by source ... 2019)

The main dairy alternative industry players that own the largest share of the market are mainly from US, there are few companies that are originally from Europe and there is one big company from Australia. It is difficult for newcomers to compete against these large companies. (*Ibid*)

Plant-based milk alternatives labelling varies from country to country, but the principle is that the manufacturer is obliged to provide consumers with meaningful information and not mislead them. People are used to refer to plant-based milk alternatives by the terms “almond milk”, oat “milk”, soy “milk” etc. Regarding to EU’s Single CMO Regulation the word “milk” can be only used for mammary secretions with an exception for coconut milk and almond milk. Due to the nutritional properties plant-based milk alternatives are rather “closer” to food than to beverages. This is a characteristic that differentiates them from thirst quenching drinks. It is, however, a characteristic that they share with milk. (Food ... 2019)

## **3. A RESEARCH OF THE BUYING BEHAVIOR AND MOTIVES OF BUYING PLANT-BASED MILK ALTERNATIVES**

This chapter is divided into three subchapters. The first subchapter explains the method of the research. The second subchapter gives an overview of the results of the survey. The third subchapter focuses on the discussion and recommendations.

### **3.1. Method of the research**

The goal of the bachelor's thesis was to identify the factors regarding buying behavior and motives when consuming plant-based milk alternatives. To reach the goal, the author of the thesis used a quantitative research method and conducted a survey. The survey was mainly focused on the consuming habits, motives and taste preferences of plant-based milk alternatives. The survey consisted of 18 questions, 7 of them were demographical. The survey was web-based and in Estonian language.

Everyone with an access to Internet could fill out the survey. The author mainly distributed the survey via Facebook, posting it to various groups. Google Forms platform was used to compose the survey and Microsoft Excel to analyse the results. The survey was opened from 21.04 to 27.04, during which 352 people filled it out. To analyse the results, the author had to remove the answers of 9 people due to incomplete answers.

The author made a summary of the respondents' socio-demographical characteristics (Figure 3). Of the 343 respondents, 303 (88.7%) were women and 40 (11.3%) men. Figure 3 shows that the respondents were rather younger people. 166 respondents (48.3%) were in the age group of 20-29. Only two respondents were either in the age group 60-69 or 70 and older. This may be due to the fact

that elderly people might not have an access to Internet. 104 (30.3%) of the respondents are currently on secondary school education level. The second most frequent level of education amongst the respondents was higher education (applied higher education or bachelor degree). Amongst the respondents, there were only two people with PhD. Because of the fact that a person's income can be a huge factor when choosing food products, the author also made a summary about the respondents' monthly net income per family member. Out of 343 respondents, the highest percentage of people (28.3%) have a monthly net income per family member more than 1500€. Only 10 people (2.9%) have a monthly net income per family member less than 300€. Respondents with no regular household income were 47 (13.7%).

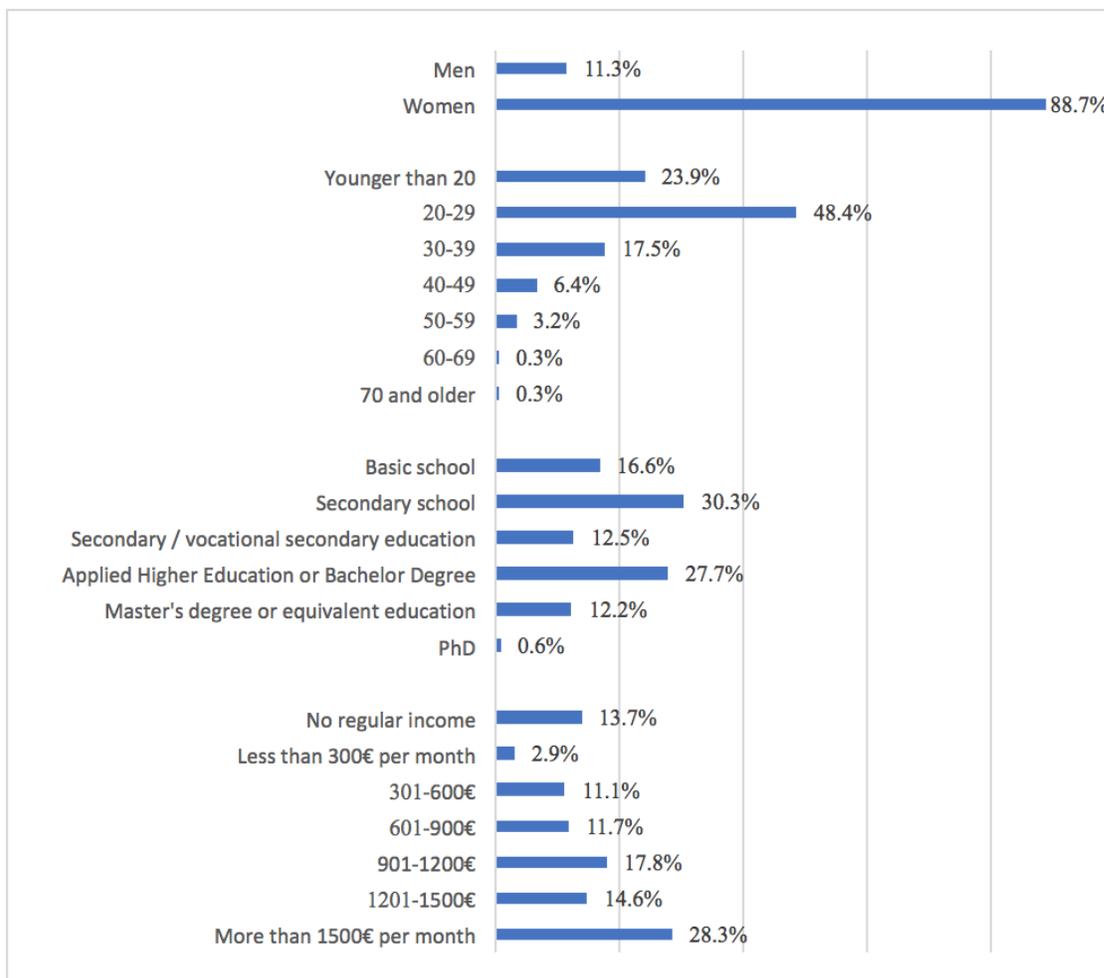


Figure 3. Socio-demographical characteristics of the sample (n=343)  
 Source: Author's calculations based on Appendix 1

The author also wanted to know about the respondents' currently acquired level of education. It turns out that 164 people (48.1%) are not studying at the moment. 75 respondents (22%) are acquiring an applied higher education or bachelor's degree. 47 (13.8%) are on a secondary school level, 27 (7.9%) people are acquiring a master's degree or equivalent education, 19 (5.6%) basic school level and 2 people (0.6%) are acquiring a PhD. (Appendix 1)

### 3.2. Results of the research

The following chapter focuses on the results of the survey. First of all, the author wanted to find out the respondents' diet (Figure 4). The results indicate that the highest proportion of the respondents are omnivores (36.7%). 87 respondents (25.4%) claimed to be vegan. The least popular diet amongst the respondents was ovo-vegetarian (3.2%).

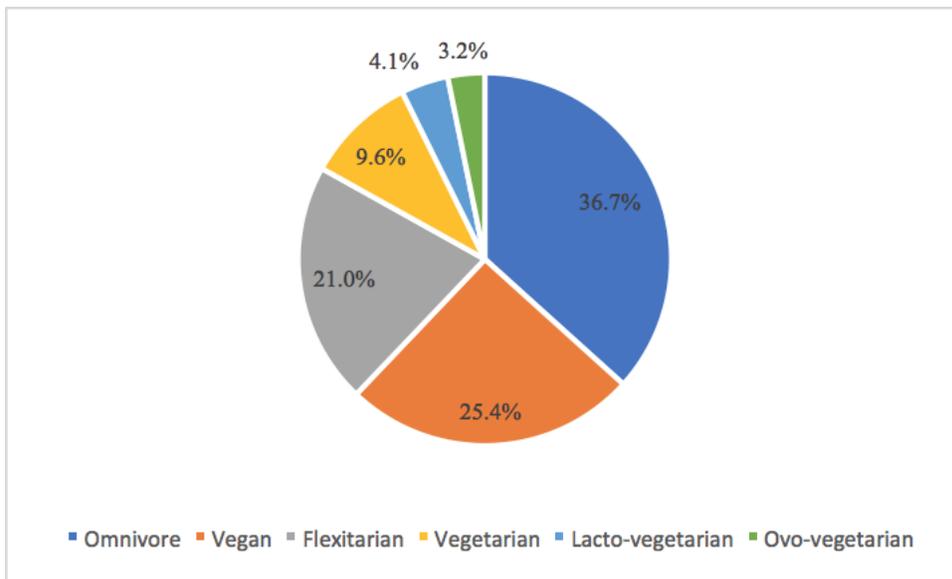


Figure 4. An overview of the respondents' diet (n=343)  
Source: Author's calculations based on Appendix 1

As mentioned before, 330 (96.2%) out of the 343 respondents have tried plant-based milk alternatives. The other 13 (3.8%) people were asked why they have not tried plant-based milk alternatives (Figure 5).

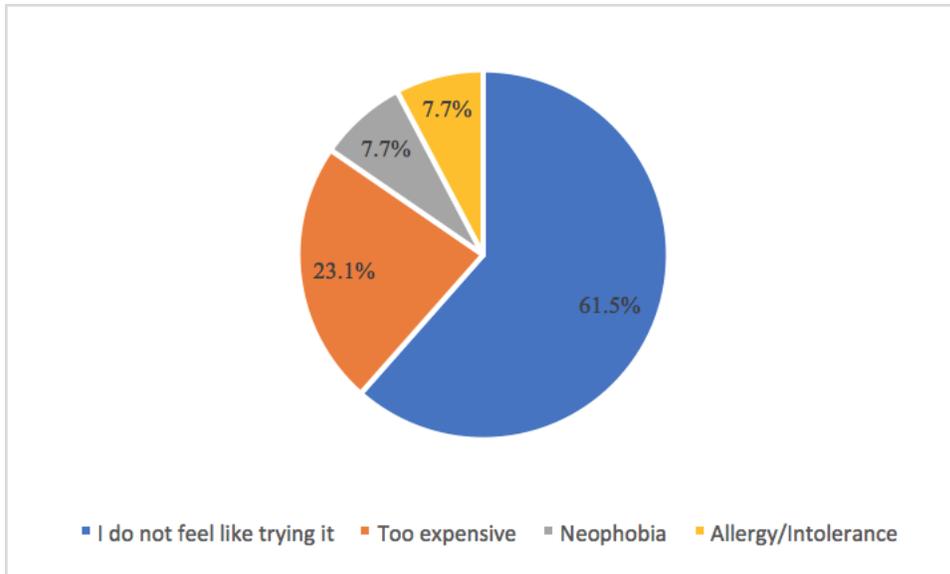


Figure 5. Summary of the reasons why people have not tried plant-based milk alternatives (n=13)  
Source: Author’s calculations based on Appendix 1

The main reason that people have not tried plant-based milk alternatives is the fact that they do not feel like trying it (61.5%). Some people noted that the prices of the plant-based milk alternatives are too expensive. Also, one person claimed to have an allergy/intolerance towards plant-based milk alternatives and one person neophobia. Neophobia is a fear of new things, for example one does not like to try new food. (Fritscher 2018)

From this point forward, the author continued analysing the results with the answers of the 330 respondents who had tried plant-based milk alternatives. The respondents were asked who or what influenced them to try plant-based milk alternatives. The results are shown in Figure 6.

It turns out that more than half (60.2%) of the respondents tried plant-based milk alternatives on their own initiative. 29 people were also influenced by a friend or a social media influencer. A small percentage of people do not remember what or who influenced them to try plant-based milk alternatives. 20 people had other sources that influenced them. Most frequent sources were doctors and nutrition advisors/dietary counsellors. Some people also claimed to have an allergy towards milk protein or intolerance towards lactose or casein.

In fact, the results showed that 66 people (20%) are casein intolerant and 24 (7.3%) lactose intolerant (Appendix 1).

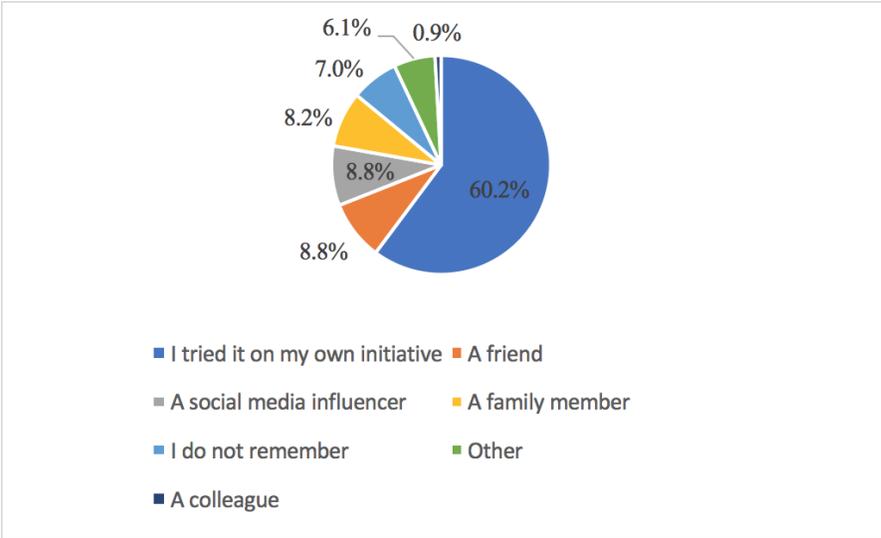


Figure 6. Summary of the results regarding the question “Was there someone who influenced you to try plant-based milk?” (n=330)  
 Source: Author’s calculations based on Appendix 1

The respondents were also asked how often they consume plant-based milk alternatives (Figure 7).

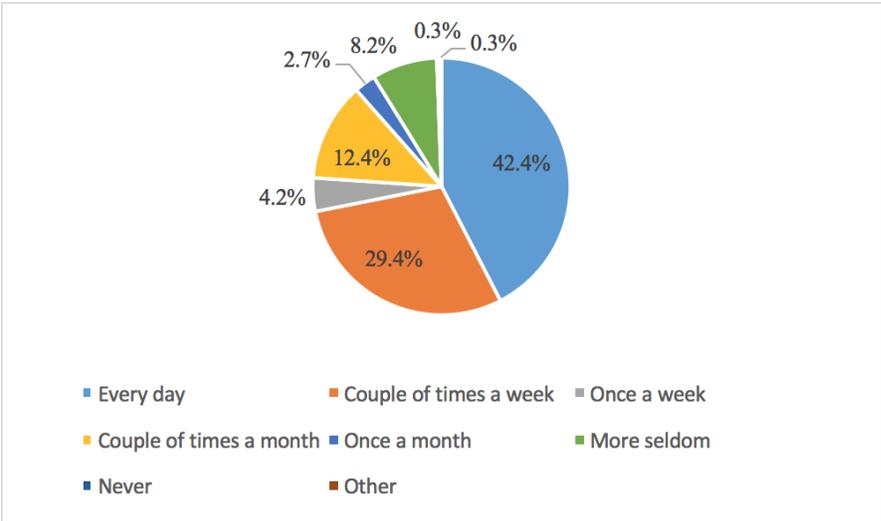


Figure 7. Summary of the frequency regarding the consumption of plant-based milk alternatives (n=330)  
 Source: Author’s calculations based on Appendix 1

According to the results, 42.4% of the respondents consume plant-based milk alternatives every day. A lot of respondents consume plant-based milk alternatives couple of times a week (29.4%). 4.2% of the people consume plant-based milk alternatives once a week, 12,4% couple of times a month, 2.7% once a month and 8.2% more seldom. Although one respondent has tried plant-based milk alternatives, he has never consumed it again. One respondent claimed to consume plant-based milk alternatives every day if there some at the household, if there are not any, then seldom.

The author analysed the consumption frequency of plant-based milk alternatives also based on different diets (Figure 8).

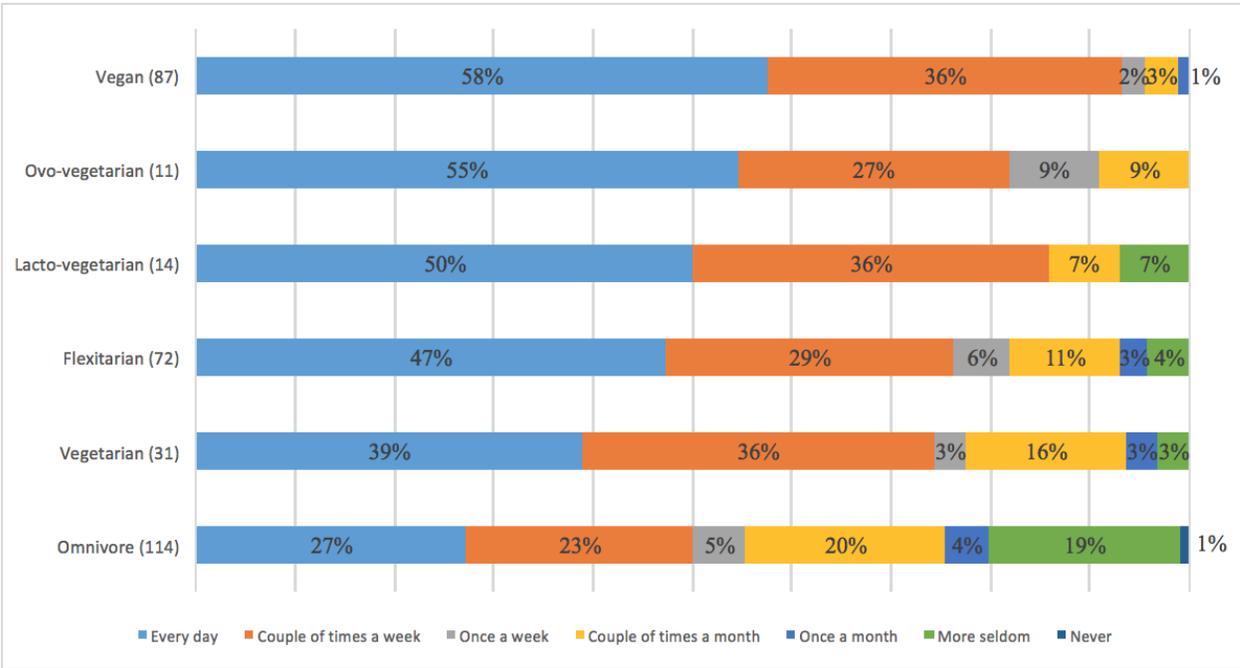


Figure 8. The frequency of plant-based milk alternatives consumption based on different diets (n=330)

Source: Author’s calculations based on Appendix 1

The results show that the highest proportion of people that consume plant-based milk alternatives every day where amongst vegans (58%). Also, 55% of the ovo-vegetarians noted that they consume plant-based milk alternatives every day. The consumption of plant-based milk alternatives is also frequent amongst lactovegetarians. 86% of the lacto-vegetarians claimed that they consume plant-based milk alternatives either every day of couple of times a week. Amongst flexitarians this amount was 76% and vegetarians 75%. The most differences can be seen amongst the omnivores. Among

omnivores, 50% of them consume plant-based milk alternatives daily or couple of times a week, 5% once a week, 20% couple of times a month, 4% once a month and 19% even more seldom.

Next, the respondents were asked to rate different plant-based milk alternatives based on their taste preferences (Figure 9). The question was based on a 5-point Likert scale (5-tastes very good... 1- do not like the taste at all).

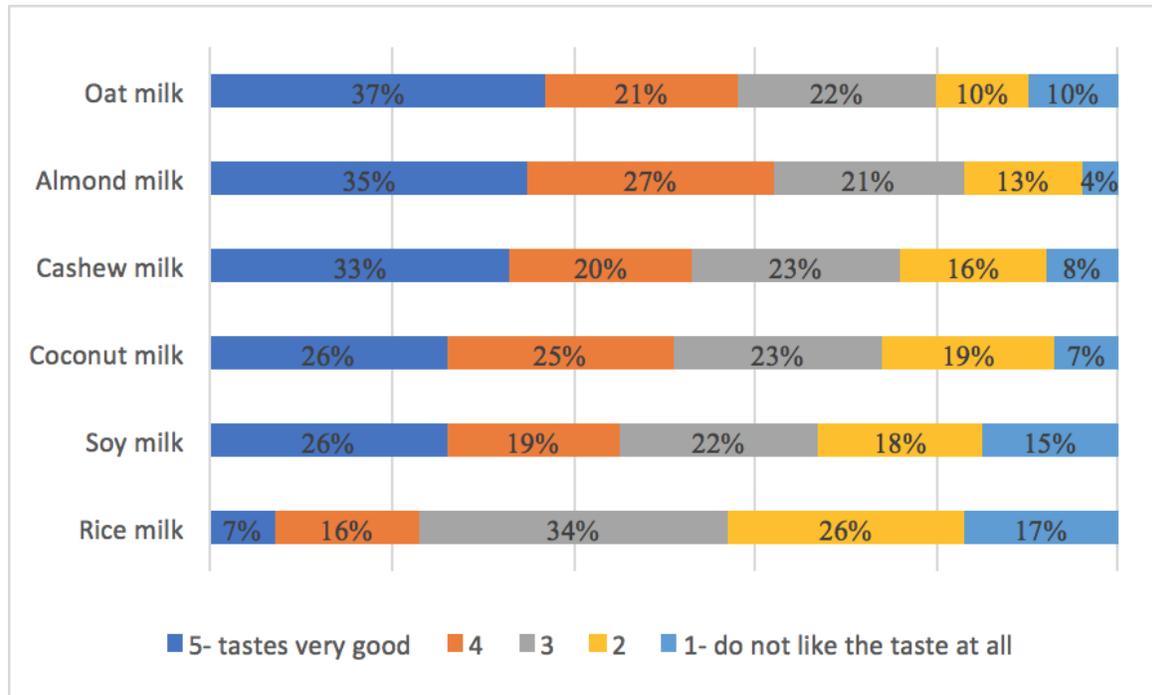


Figure 9. Summary of the taste preferences on different kinds of plant-based milk alternatives (n=330)

Source: Author’s calculations based on Appendix 1

Figure 9 shows that the respondents like the taste of almond milk the best. 204 people (62%) out of 330 pointed out that for them almond milk tastes good or very good. The next most popular plant-based milk alternatives were oat milk and cashew milk. There were 191 people (58%) who think that oat milk and 175 people (53%) that cashew milk tastes good or very good. In addition, one might say that popular were also coconut milk and soy milk. The one plant-based milk alternative that the respondents find the least tasty is the rice milk. Although there were many people who do find the taste of rice milk good, the majority of respondents are neutral or do not like the taste of rice milk.

Due to the fact that the question was based on a 5-point Likert scale, the author calculated the mean values of the answers to see if there are any differences amongst different diets. Results indicate that oat milk was the most popular amongst lacto-vegetarians, almond and soy milk amongst ovo-vegetarians, coconut milk amongst vegetarians, cashew and rice milk amongst vegans. It turned out that oat, almond, soy and rice milk were the least popular alternatives amongst omnivores. Cashew and coconut milk were the least popular amongst lacto-vegetarians. (Appendix 2)

In order to identify the buying behavior and motives regarding plant-based milk alternatives, the author asked the respondents how important they find different factors and parameters when buying plant-based milk alternatives (Figure 10). Again, the question was based on a 5-point Likert scale (5-very important...1- not at all important).

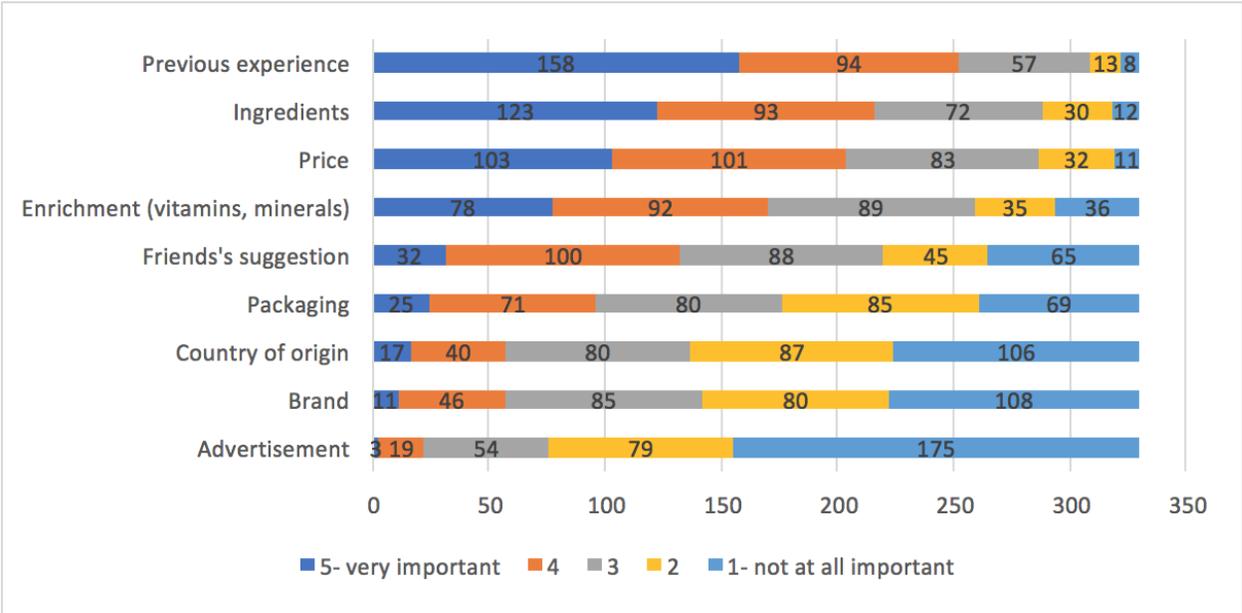


Figure 10. Summary of the importance of different factors when buying plant-based milk alternatives (n=330)

Source: Author’s calculations based on Appendix 1

The results indicate that when buying plant-based milk alternatives the most important factor is previous experience. As many as 252 respondents (76.4%) think that previous experience is important or very important. The ingredients of the plant-based milk alternatives is the second most important factor, 216 people (65.5%) found it important. Based on its importance, the price of the product is on

the third place. Out of 330, 204 respondents (61.8%) think that price is either important or very important. Enrichment of the plant-based milk alternative has also a significant role amongst people when choosing a product. The least important factor was the advertisement. 254 people (77%) people think that advertisement is rather not or not at all important. Also, the country of origin and brand do not seem to affect people very much. The biggest differences regarding importance were found between friend's suggestion and packaging. There were certain people who thought these factors are important but at the same time some people found them rather unimportant.

To see the differences in answers amongst different diets, the author once again calculated the mean values of the answers. The calculations show that the mean values of ingredients (4.00), brand (2.82), friend's suggestion (3.36) and previous experience (4.73) were the highest amongst ovo-vegetarians. Packaging (3.14) and advertisement (2.21) were the most important amongst lacto-vegetarians. The mean values of country of origin (2.43) and enrichment (3.72) were the highest amongst vegans. The price factor was found to be the most important factor amongst vegetarians. (Appendix 3)

To identify possible correlations between different factors when buying plant-based milk alternatives, the author has carried out a spearman correlation analysis. The results show that there were not any strong correlations between different factors. The strongest correlation was between the factors packaging and country of origin (correlation coefficient 0.43). The correlation coefficient between brand and country of origin was 0.39. Between brand and advertisement, the coefficient was 0.38. In any case, the correlations were not strong enough to make any conclusions. (Appendix 4)

The respondents were also asked to rate their agreement or disagreement towards different statements about plant-based milk alternatives (Figure 11). Once again, the question was based on a 5- point Likert scale (5- strongly agree... 1- strongly disagree).

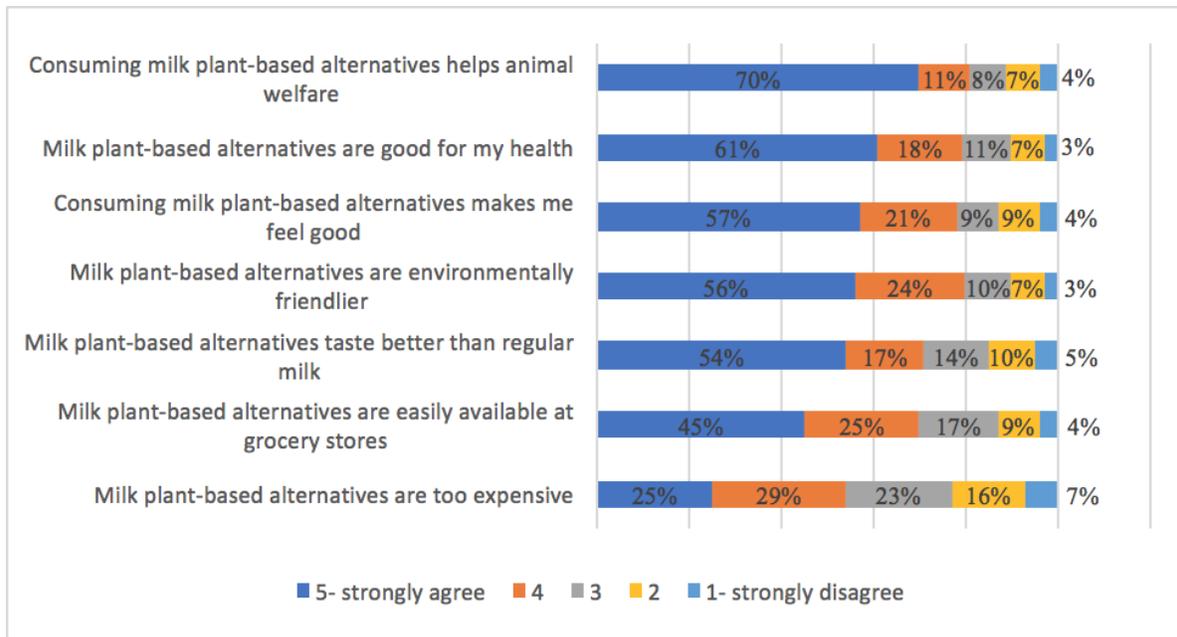


Figure 11. Summary of the agreement and disagreement towards different statements about plant-based milk alternatives (n=330)

Source: Author’s calculations based on Appendix 1

As seen on Figure 11 respondents showed mostly agreement towards all the statements. According to the results, the respondents agreed the most with the fact that consuming plant-based milk alternatives helps animal welfare. It can be said that 265 people (81%) out of 330 find it an important aspect. A huge proportion of respondents also think that plant-based milk alternatives are good for their health. A total of 264 respondents (79%) agree with that statement. It also turned out that consuming plant-based milk alternatives make them feel good and it tastes better than regular milk. The respondents mostly noted that plant-based milk alternatives are easily available at grocery stores and also agreed with the fact that plant-based milk alternatives are environmentally friendlier. The biggest differences can be seen concerning the factor of price. Although there were some people who stated that plant-based milk alternatives are not too expensive, the bigger half still thought they are. As many as 77 people (23%) stated their neutrality regarding that matter.

To identify possible correlations between different statements about plant-based milk alternatives, the author once again has carried out a spearman correlation analysis. The correlation analysis indicates that there were two strong correlations. The strongest correlations were between statements “consuming plant-based milk alternatives makes me feel good” + “plant-based milk alternatives are

good for my health” and “consuming plant-based milk alternatives helps animal welfare” + “plant-based milk alternatives are environmentally friendlier”. In both cases, the correlation coefficient was 0.71. (Appendix 5)

The author also wanted to find out from the respondents if their health factors has improved after starting consuming plant-based milk alternatives (Figure 12). The respondents had to give their answer on scale from 1 to 5 with 1 being “I do not feel any differences” and 5 being “I feel a huge difference”.

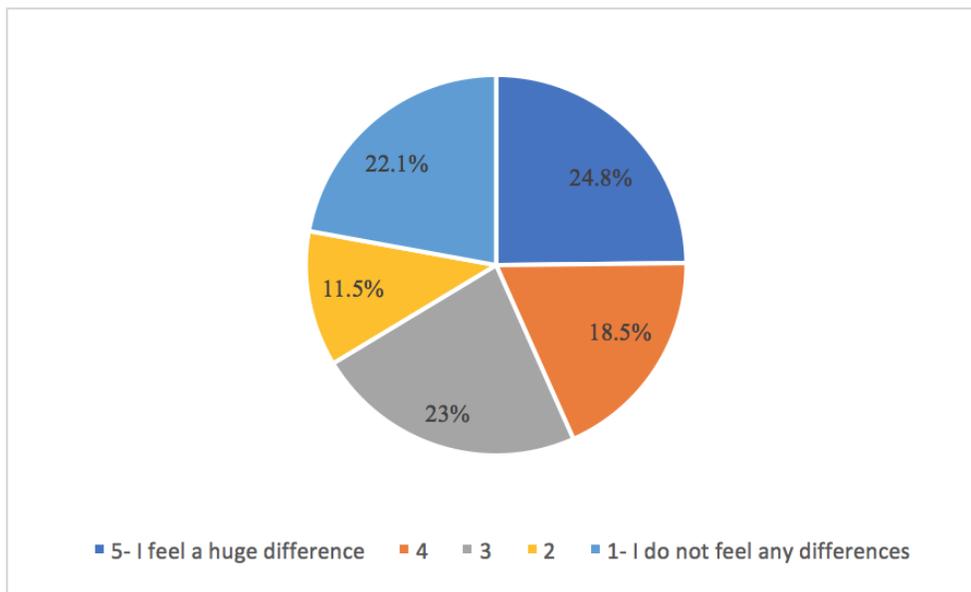


Figure 12. Summary of the differences regarding health aspects after starting consuming plant-based milk alternatives (n=330)

Source: Author’s calculations based on Appendix 1

The mean value of the results was 3.12 which means that there were people that either said they feel a huge difference, do not feel any differences or were neutral. In any case, based on these results, it is impossible to make any definite conclusions on plant-based milk alternatives regarding the improvement of health.

Last but not least, the author asked the respondents if they think that there is something manufacturers should improve on the plant-based milk alternatives sold in Estonia (Appendix1). The respondents had an opportunity to mark various answers. As many as 232 respondents (69,9%) noted that plant-

based milk alternatives should be cheaper. Also, a majority of respondents (58,1%) wish to see more unsweetened versions of plant-based milk alternatives in the stores. In addition, many want to consume plant-based milk alternatives consisting of fewer artificial substances (53.9%) and food additives (48.2%). Moreover, many recommended to start using glass packaging (39.8%) and that manufacturers should consider putting them into smaller packages (29.4%).

### **3.3. Discussion and recommendations**

The results indicate that the highest proportion of the respondents are omnivores. The second most represented diet was veganism. The least popular diet amongst the respondents was ovo-vegetarian. A majority of the respondents had tried plant-based milk alternatives. More than half of them tried plant-based milk alternatives on their own initiative, some were also influenced by a friend or a social media influencer. The main reason that people have not tried plant-based milk alternatives is the fact that they do not feel like trying it. Some people noted that the prices of the plant-based milk alternatives are too expensive.

It turned out that a lot of people consume plant-based milk alternatives every day. The highest proportion of people that consume plant-based milk alternatives every day where amongst vegans. Also, the results showed that the consumption of plant-based milk alternatives is frequent amongst ovo-vegetarians and lacto-vegetarians.

Regarding the taste preferences of different kinds of plant-based milk alternatives, the respondents seemed to like almond milk the best. The next most popular plant-based milk alternatives were oat milk, cashew milk and coconut milk. Results indicated that almond milk was the most popular amongst ovo-vegetarians, flexitarians and omnivores, oat milk amongst lacto-vegetarians, cashew milk amongst vegans and coconut milk amongst vegetarians.

When buying plant-based milk alternatives, people find their previous experience as the most important factor. People also find the ingredients of a plant-based milk alternative very important. Based on its importance, the price of the product was on the third place. It turned out that the importance of previous experience and the ingredients of the product was the highest amongst ovo-

vegetarians. Out of different diets, vegetarians were the ones who focus on the price factor the most. The least important factor was the advertisement. Also, the country of origin and brand do not seem to affect people very much when buying plant-based milk alternatives. The biggest differences regarding the importance were between friend's suggestion and packaging. There were certain people who thought these factors are important but at the same time some people found them rather unimportant.

According to the results, the respondents agreed the most with the fact that consuming plant-based milk alternatives helps animal welfare. People also find plant-based milk alternatives good for their health. In addition, plant-based milk alternatives make the respondents feel good and they mostly think that plant-based milk alternatives taste better than regular milk.

To the question "Do you feel any differences after starting consuming plant-based milk alternatives" there were people that either said they feel a huge difference, do not feel any differences or were neutral. In any case, based on these results, it is impossible to make any conclusions on plant-based milk alternatives regarding the improvement of health.

Concerning the matter if the respondents think that there is something manufacturers should improve on the plant-based milk alternatives sold in Estonia, people mostly pointed out that the prices of products should be cheaper. Also, a lot of people wishes to see more unsweetened versions of plant-based milk alternatives in the stores. In addition, many people want to consume plant-based milk alternatives that consist of fewer artificial substances and food additives. Regarding the packaging of products, many recommended to start using glass packaging and manufacturers should consider putting them into smaller packages.

## CONCLUSION

The aim of the thesis was to determine the main reasons why people choose plant-based milk alternatives and what are the driving factors that influence the plant-based milk alternatives buying behavior of people in Estonia. To collect information regarding the buying behavior and motives when consuming plant-based milk alternatives, the author of this thesis used a quantitative research method and conducted a survey. The survey mainly focused on the consuming habits, motives and taste preferences of plant-based milk alternatives. Out of the respondents 303 (88.7%) were women and 40 (11.3%) men.

Out of the 343 respondents 330 had tried plant-based milk alternatives. The other 13 respondents mostly consisted of people that do not feel like trying it or argue that the plant-based milk alternatives are too expensive. When researching the consumption and factors influencing the buying behavior of plant-based milk alternatives, the author continued analysing the results with the answers of the 330 respondents who had tried plant-based milk alternatives.

When buying plant-based milk alternatives, people find their previous experience as the most important factor. People also find the ingredients of a plant-based milk alternative very important. Based on its importance, the price of the product was on the third place. The least important factor was the advertisement. Also, the country of origin and brand do not seem to affect people very much when buying plant-based milk alternatives. The biggest differences regarding the importance were between friend's suggestion and packaging. There were people who thought these factors are important but at the same time some people found them rather unimportant.

The respondents found the fact that consuming plant-based milk alternatives helps animal welfare most important. People also found that plant-based milk alternatives are good for their health. In addition, plant-based milk alternatives make the respondents feel good and they mostly think that plant-based milk alternatives taste better than regular milk.

Regarding the recommendations to plant-based milk alternatives manufacturers, people pointed out that the prices of products should be cheaper. Also, a lot of people wishes for an option to choose from more unsweetened versions of plant-based milk alternatives. In addition, many people want to consume plant-based milk alternatives that consist of fewer artificial substances and food additives. Regarding the packaging of products, many recommended to start using glass packaging and manufacturers should consider putting plant-based milk alternatives into smaller packages.

The author of this thesis believes that the results along with the recommendations made by the respondents give a brief overview to manufacturers and marketers concerning the matter of the motives, factors and buying behavior of plant-based milk alternatives. Due to the fact that the sample of the research consisted mostly of women, one should in the future focus more on involving more male respondents to make more definite conclusions that can apply to both genders.

## LIST OF REFERENCES

- Arnarson, A. (2017). *Seven benefits of almond milk*. Accessible: <https://www.medicalnewstoday.com/articles/318612.php>, 29 March 2019.
- Blackwell, R. D., Miniard, P. W., Engel, J. F. (2006). *Consumer behavior*. 10th ed. Mason, Ohio: Thomson South-Western.
- Chavarro, J. E., Toth, T. L., Sadio, S. M., Hauser, R. (2008). Soy food and isoflavone intake in relation to semen quality parameters among men from an infertility clinic – *Human reproduction (Oxford, England)*. Vol. 23, No. 11, 2584–2590.
- Dairy Alternatives Market Size, Share & Trends Analysis Report by Product (Soy Milk, Almond Milk, Rice Milk), By Formulation (Plain, Flavored), By Application (Food, Beverages), And Segment Forecasts, 2019 – 2025* (2019). Accessible: <https://www.grandviewresearch.com/industry-analysis/dairy-alternatives-market>, 5 April 2019
- Dairy Alternatives Market by Source (Soy, Almond, Coconut, Rice, Oats, Hemp), Application (Milk, Cheese, Yogurt, Ice Creams, Creamers), Distribution Channel (Supermarkets, Health Stores, Pharmacies), Formulation and Region – Global Forecast to 2023* (2019). Accessible: <https://www.marketsandmarkets.com/Market-Reports/dairy-alternative-plant-milk-beverages-market-677.html>, 05 April 2019
- Engel, J. F., Blackwell, R. D., Miniard, P. W. (1990). *Consumer behavior*. 6th ed. Chicago: Dryden Press.
- Eske, J. (2018). *Health benefits of coconut milk*. Accessible: <https://www.medicalnewstoday.com/articles/323743.php>, 30 March 2019.
- Food labeling*. Accessible: <http://www.ensa-eu.org/eu-legislation/food-labeling>, 10 April 2019
- Forestell, C. A. (2018). Flexitarian Diet and Weight Control: Healthy or Risky Eating Behavior?. *Frontiers in nutrition*. Vol. 5, No. 59, 1-6.
- Foxall, G. R., Goldsmith, R. E., Brown, S. (1998). *Consumer Psychology for Marketing*. 2nd ed. London: International Thomson Business Press.
- Fritscher, L. (2018). *Neophobia as the Fear of New Things*. Accessible: <https://www.verywellmind.com/what-is-the-fear-of-new-things-2671892>, 24 April 2019

- Gresser, M. R. (2015). The consumption of dairy and dairy alternatives and the perception of dairy in college students. (Master's thesis). Kent State University College of Education, Health and Human services. Kent.
- Hawkins, D. I., Best, R. J., Coney, K. A. (2001). *Consumer Behavior: Building Marketing Strategy*. 8th ed. Boston: Irwin/McGraw Hill.
- Hawkins, D. I., Mothersbaugh, D. L. (2013). *Consumer Behavior: Building Marketing Strategy*. 12th ed. New York: McGraw-Hill.
- Kenk, K. (2013). *Kolm ostukäitumise tüüpi*. Accessible: <http://arileht.delfi.ee/news/uudised/kolm-ostukaitumise-tuupi?id=50732398>, 4 April 2019
- Kes/mis on vegan?* Accessible: <http://vegan.ee/veganlusest/kesmis-on-vegan/>, 10 April 2019
- Kotler, P. Armstrong, G. (2011). *Principles of Marketing*. 14th ed. New Jersey: Pearson Prentice Hall.
- Kotler, P. Keller, K. L. (2006). *Marketing Management*. 12th ed. New Jersey: Pearson Prentice Hall.
- Krešić, G., Herceg, Z., Lelas, V., Jambrak, A. R. (2010). Consumers' behavior and motives for selection of dairy beverages in Kvarner region: a pilot study. – *Mljekarstvo/Dairy*. Vol. 60, No. 1, 50-58.
- Lactose intolerance*. Accessible: <https://www.nhs.uk/conditions/lactose-intolerance/>, 5 April 2019
- Li, X., Xin, Y. (2015). Factors Influencing Organic Food Purchase of Young Chinese Consumers. (Master's thesis). Uppsala University, Department of Business Studies. Uppsala.
- Loudon, D., Bitta, A. J. D. (1993). *Consumer Behavior: Concepts and Applications*. 4th ed. New York: McGraw- Hill.
- Mäkinen, O. E., Wanhalinna, V., Zannini, E., Arendt, E. K. (2015). Foods for Special Dietary Needs: Non-Dairy Plant Based Milk Substitutes and Fermented Dairy Type Products. – *Critical Reviews in Food Science and Nutrition*. Vol. 56, No. 3, 339-349.
- Nair, S. R. (2009). *Consumer behaviour*. Mumbai: Himalaya Publishing House.
- Parrish, C. R. (2018). Moo-ove Over, Cow's Milk: The Rise of Plant-Based Dairy Alternatives – *Nutrition issues in gastroenterology*. Vol. 171, 20-27.
- Rada, J. J. (1999). What makes buyers buy? – *The American Salesman*. Vol. 44, No. 12, 25-29.
- Raman, R. (2019). *Oat Milk: Nutrition, Benefits, and How to Make It*. Accessible: <https://www.healthline.com/nutrition/oat-milk>, 30 March 2019.
- Schiffman, L. G., Kanuk, L. (2007). *Consumer behavior*. 9th ed. New Jersey: Pearson Prentice Hall.

- Schiffman, L. G., Wisenblit, J. L. (2015). *Consumer Behavior*. 11th ed. Harlow: Pearson Education.
- Sethi, S., Tyagi, S.K., Anurag, R.K. (2016). Plant-based milk alternatives an emerging segment of functional beverages: a review. –*Journal Food Science Technology*. Vol. 53, No. 9, 3408-3423.
- Solomon, M., Bamossy, G., Askegaard, S., Hogg, M. K. (2006). *Consumer Behavior: A European Perspective*. 3rd ed. London: Prentice Hall.
- Streit, L. (2019). *10 Nutrition and Health Benefits of Cashew Milk*. Accessible: <https://www.healthline.com/nutrition/cashew-milk-benefits>, 30 March 2019.
- Sun, Y. H. C. (2008). Health concern, food choice motives, and attitudes toward healthy eating: The mediating role of food choice motives. *Appetite*. Vol. 51, No. 1, 42-49.
- Tallinnas tähistatakse täna taimse piima päeva* (2018). Accessible: <https://www.muurileht.ee/tallinnas-tahistatakse-tana-taimse-piima-paeva/>, 5 April 2019.
- Thong, N. T., Solgaard, H. S. (2016). Consumer's food motives and seafood consumption. – *Food Quality and Preference*. Vol. 56, 181-188
- Vandenplas, Y., Brueton, M., Dupont, C., Hill, D., Isolauri, E., Koletzko, S. Oranje, A. P., Staiano, A. (2007). Guidelines for the diagnosis and management of cow's milk protein allergy in infants. – *Archives of Disease in Childhood*. Vol. 92, No. 10, 902-908.
- Vicentini, A., Liberatore, L., Mastrocola, D. (2016). Functional foods: trends and development of the global market. – *Italian Journal of Food Science*. Vol. 28, No. 2, 338-351.

# APPENDICES

## Appendix 1. The survey with results

Dear Respondent!

I am a student at the Faculty of Economics in Tallinn University of Technology and I am currently writing a graduation thesis on factors influencing consumer behavior to find reasons and motives that affect the consumption or not consumption of plant-based milk alternatives. Your answers are extremely important and I kindly ask you to find about 8-10 minutes to answer to all questions. The questionnaire is anonymous.

If you have any questions, I'd be happy to answer them.

Kimberlyvalgema@gmail.com

Thank you for your time!

### 1. Describe your diet

- Omnivorous (consume both, animal- and plant-based products on a regular basis) (36.7%)
- Flexitarian (increased intake of plant-based meals without completely eliminating meat) (21%)
- Vegetarian (does not consume meat or fish) (9.6%)
- Vegan (food of animal origin is excluded) (25.4%)
- Ovo-vegetarian (does not consume meat, fish or dairy products, but consumes eggs) (3.2%)
- Lacto-vegetarian (does not consume meat, fish or eggs, but consumes dairy products) (4.1%)

2. Have you tried plant-based milk alternatives?
  - Yes (96.2%)
  - No (3.8%)
  
3. What has been the main reason that you have not tried plant-based milk alternatives?
  - Neophobia (fear of new things, e.g. I do not like to try new food) (7.7%)
  - Too expensive (23.1%)
  - Allergy/intolerance (7.7%)
  - I do not feel like trying it (61.5%)
  
4. Was there someone who influenced you to try plant-based milk alternative?
  - A family member (8.2%)
  - A friend (8.8%)
  - A colleague (0.9%)
  - A social media influencer (8.8%)
  - I tried it on my own initiative (60.3%)
  - I do not remember (7%)
  - Other (6.1%)
  
5. How often do you consume plant-based milk alternatives?
  - Everyday (42.4%)
  - Couple of times a week (29.4%)
  - Once a week (4.2%)
  - Couple of times a month (12.4%)
  - Once a month (2.7%)
  - More seldom (8.5%)
  - Never (0,3%)

**Appendix 1 continued**

6. How would you evaluate the following plant-based milk alternatives?

	1	2	3	4	5
Soy milk	14.8%	17.6%	22.1%	19.1%	26.4%
Rice milk	17%	26%	33.6%	16.4%	7%
Almond milk	4.3%	12.7%	21.2%	27.3%	34.5%
Coconut milk	7.3%	19.1%	23%	25.2%	25.4%
Cashew milk	8.2%	15.8%	23%	20.3%	32.7%
Oat milk	9.7%	10.3%	22.1%	20.6%	37.3%

7. How would you rate the following statements about plant-based milk alternatives?

	1	2	3	4	5
Consuming plant-based milk alternatives helps animal welfare	70%	11%	8%	7%	4%
Plant-based milk alternatives are good for my health	61%	18%	11%	7%	3%
Consuming plant-based milk alternatives makes me feel good	57%	21%	9%	9%	4%
Plant-based milk alternatives are environmentally friendlier	56%	24%	10%	7%	3%
Plant-based milk alternatives taste better than regular milk	54%	17%	14%	10%	5%
Plant-based milk alternatives are easily available at grocery stores	45%	25%	17%	9%	4%
Plant-based milk alternatives are too expensive	25%	29%	23%	16%	7%

**Appendix 1 continued**

8. How important are the following factors while buying plant-based milk alternatives for you?

	1	2	3	4	5
Previous experience	2.4%	3.9%	17.3%	28.5%	47.9%
Ingredients	3.6%	9.1%	21.8%	28.2%	37.3%
Price	3.3%	9.7%	25.2%	30.6%	31.2%
Enrichment(vitamins, minerals)	10.9%	10.6%	27.0%	27.9%	23.6%
Friend's suggestion	19.7%	13.6%	26.7%	30.3%	9.7%
Packaging	20.9%	25.8%	24.2%	21.5%	7.6%
Country of origin	32.1%	26.4%	24.2%	12.1%	5.2%
Brand	32.7%	24.2%	25.8%	13.9%	3.3%
Advertisement	53.0%	23.9%	16.4%	5.8%	0.9%

9. Are you intolerant to lactose or casein?

- Lactose intolerant (20%)
- Casein intolerant (7.3%)
- Neither (75.8%)

10. Do you feel any differences after starting to consume plant-based milk alternative products?

1	2	3	4	5
22.1%	11.5%	23%	18.5%	24.8%

## Appendix 1 continued

11. Is there something manufacturers should improve on the plant-based milk alternatives sold in Estonia?

Lower price	70.8%
More unsweetened versions	58.1%
Less artificial substances	54.4%
Less e-substances	48.6%
Glass packaging	39.8%
Smaller package	29.5%
Bigger package	0.9%
Nature-friendly packaging	0.6%
Less watery	0.3%
Greater availability	0.9%
Domestic production	0.6%
Bigger choice	0.6%
New flavours	0.3%
Better nutritional value	0.6%

12. Your gender:

- Woman (88.3%)
- Man (11.7%)

13. Your age:

- 20 or below (23.9%)
- 20-29 (48.4%)
- 30-39 (17.5%)
- 40-49 (6.4%)
- 50-59 3.2%)
- 60-69 (0.3%)
- 70 or older (0.3%)

14. Your current level of education:

- Basic school (16.6%)
- Secondary school (30.3%)
- Secondary/vocational secondary education (12.5%)
- Higher education (Applied higher education or Bachelor degree) (27.7%)
- Higher education (Master's degree or equivalent education) (12.2%)
- PhD (0.6%)

15. If you are acquiring a certain education level at the moment, then please state it below.

- Basic education in acquisition (5.6%)
- Secondary education in acquisition (13.8%)
- Applied higher education or Bachelor's degree in acquisition (22%)
- Master's degree in acquisition (10%)
- Doctorate in acquisition (0.6%)
- Not acquiring higher education at the moment (48.1%)

16. Who live with you? (Please indicate all members residing primarily at the same address as you):

- I live alone (16%)
- Partner/wife/husband (44.9%)
- A child (9.3%)
- Children (11.7%)
- Brother(s)/sister(s) (5%)
- Parent(s) (28%)
- Roommate(s)/flat mate(s) (7.9%)
- Grandparent(s) (0.7%)

17. Monthly net income per household:

- No regular income (13.7%)
- 300€ or below (2.9%)
- 301-600€ (11.1%)
- 601-900€ (11.7%)
- 901-1200€ (17.8%)
- 1201-1500€ (14.6%)
- 1501-...€ (28.3%)

Source: Author's research

**Appendix 2. The mean values based on the answers regarding the taste preferences of different plant-based milk alternatives**

<b>Diet (number of people)</b>	<b>MEAN VALUES</b>					
	Oat milk	Almond milk	Cashew milk	Coconut milk	Soy milk	Rice milk
Omnivore (114)	3.27	3.62	3.31	3.40	2.66	2.46
Vegan (87)	4.25	3.84	3.99	3.43	3.85	2.99
Flexitarian (72)	3.35	3.69	3.50	3.40	3.00	2.63
Vegetarian (32)	3.81	3.94	3.47	3.59	3.84	2.88
Lacto-vegetarian (14)	4.29	3.71	3.07	3.29	3.57	2.93
Ovo-vegetarian (11)	3.64	4.27	3.36	3.45	4.00	2.64
<b>Total (330)</b>	<b>3.77</b>	<b>3.85</b>	<b>3.45</b>	<b>3.43</b>	<b>3.49</b>	<b>2.75</b>

Source: Author's calculations

**Appendix 3. The mean values based on the answers regarding the importance of different factors when buying plant-based milk alternatives**

MEAN VALUES							
	Omnivore	Vegan	Flexitarian	Vegetarian	Lacto-vegetarian	Ovo-vegetarian	TOTAL
Price	3.86	3.69	3.74	3.88	3.71	3.36	3.71
Ingredients	3.79	3.95	3.96	3.78	3.50	4.00	3.83
Bränd	2.32	2.36	2.22	2.03	2.64	2.82	2.40
Päritolumaa	2.30	2.43	2.29	2.25	2.07	2.36	2.28
Pakend	2.54	2.91	2.50	2.75	3.14	3.00	2.81
Reklaam	1.86	1.71	1.72	1.53	2.21	1.91	1.82
Sõbra soovitus	3.04	2.67	3.21	2.88	2.93	3.36	3.01
Eelnev kogemus	4.02	4.25	4.31	4.06	3.64	4.73	4.17
Rikastatud	3.32	3.72	3.25	3.41	3.36	3.45	3.42

Source: Author's calculations

**Appendix 4. Correlation analysis based on the importance of different factors when buying plant-based milk alternatives**

	Price	Ingredients	Brand	Country of origin	Packaging	Advertisement	Friends suggestion	Previous experience	Enrichment
Price	1								
Ingredients	0.22	1							
Brand	0.05	0.15	1						
Country of origin	0.00	0.38	0.39	1					
Packaging	0.15	0.21	0.26	0.43	1				
Advertisement	0.12	-0.01	0.38	0.21	0.34	1			
Friends suggestion	0.15	0.13	0.14	0.21	0.18	0.33	1		
Previous experience	0.11	0.19	0.17	0.17	0.07	0.04	0.36	1	
Enrichment	0.18	0.20	0.20	0.19	0.22	0.15	0.14	0.25	1

Source: Author's calculations

## Appendix 5. Correlation analysis based on different statements about plant-based milk alternatives

	1	2	3	4	5	6	7
1	1						
2	0.09	1					
3	0.17	0.52	1				
4	0.08	0.45	0.55	1			
5	0.13	0.25	0.36	0.27	1		
6	0.19	0.54	0.71	0.44	0.35	1	
7	0.16	0.49	0.62	0.71	0.32	0.56	1

Source: Author's calculations

Nr.	Statement
1	Plant-based milk alternatives are too expensive
2	Plant-based milk alternatives taste better than regular milk
3	Consuming plant-based milk alternatives makes me feel good
4	Consuming plant-based milk alternatives helps animal welfare
5	Plant-based milk alternatives are easily available at grocery stores
6	Plant-based milk alternatives are good for my health
7	Plant-based milk alternatives are environmentally friendlier

Source: Author's research