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CONSUMER BUYING BEHAVIOR OF FINNISH CONSUMERS WHEN BUYING DAIRY MILK AND PLANT-BASED MILK ALTERNATIVES

Bachelor's thesis
Programme International Business Administration, specialisation Marketing

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Tallinn 2022

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The document length is 12926 words from the introduction to the end of conclusion.

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ABSTRACT

Milk is a key part of the Nordic food tradition, but the industry of plant-based milk alternatives has been in rapid growth flow since the early 2000s. Current market is fascinated by the huge potential of expansion options and now a never-ending number of plant-based drinks are entering the supermarkets selection. Plant-based milk alternatives are a growing trend and in Finland they have become fashionable.

In this thesis the author covers the consumer behaviour theory about factors affecting purchase decision, milk consumption and industry in Finland, different plant-based milk alternatives, and factors affecting the purchase decision of either milk or plant-based milk alternatives. This thesis aims to find the main factors affecting the purchase decisions of Finnish consumers, when buying milk and plant-based alternatives. It examines both the effects of different factors that might affect the purchasing decision of Finnish consumers and the importance of each factor. Two research questions are 'What are the most and least important factors that influence Finnish consumer's purchasing decision when buying milk?' and 'What are the most and least important factors that influence Finnish consumer's purchasing decision when buying plant-based milk alternatives?'.

Primary data is collected using quantitative method: an online questionnaire. The main results show that the most important factors when buying milk are taste, degree of domesticity and earlier experience. In case of plant-based alternatives, most important factors are taste and earlier experience. The least important factors for both are food trends, new product to the market and popularity of the product.

Keywords: Consumer buying behavior, factors affecting purchase decision, dairy milk, plant-based alternatives

INTRODUCTION

Finns consume one of the highest amounts of milk per capita in the world: people in Finland drink milk more than 100 liters per person per year (Saarnia 2020; Statistics Finland 2021). Even though the consumption of drinking milk has declined in recent years, Finland is still one of the leading countries in the consumption of dairy products (Jalonen 2020). In a changing world, some consumers are looking for more healthier, sustainable, and ethical options for not just milk, but other dairy products as well. "Millennials and their offspring are today's and tomorrow's consumers, demographics with unprecedented expectations of the food supply chain" (Berry 2016, 441). Today's and tomorrow's consumers are looking for something different, and for dairy brands to thrive, it is essential to understand that consumers want "customization, simplicity and transparency but at the same time demand convenience, deliciousness and portability" (*Ibid*., 441). Consumption in Finland has pretty much differentiated over the last couple of decades and therefore there must be something for everyone (Alijoki 2012). In Finland a regular grocery store can sell more than 50 different milks (*Ibid.*), but plant-based milk alternatives are a growing trend (Sethi *et al*. 2016).

The research problem of this thesis is the lack of knowledge in terms of the level of importance of certain factors which might affect the purchase decision of Finnish consumers', when buying either dairy milk or plant-based milk alternatives. In this thesis Finnish consumer is a person living in Finland and speaks Finnish as mother language. In a country like Finland where people have been drinking milk for decades, new plant-based milk alternatives have entered the market and become popular. At the same time, operators in the market lack information on which factors matter most when buying either dairy milk or plant-based milk alternative. There is a lack of knowledge whether the same factors are important in both cases or not. The factors influencing the Finnish consumers' buying behavior while buying dairy milk and plant-based alternatives are inadequately studied and lacking up to date specified information. Therefore, the research is needed.

This thesis aims to find the main factors affecting the purchase decisions of Finnish customers, when buying dairy milk and deciding between plant-based alternatives. It examines both the effects of different factors that might affect the purchasing decision of Finnish consumers and the importance of each factor. In addition, this thesis aims to provide additional information on consumers' purchasing behaviors for dairy milk and plant-based milk alternatives for the operators in the current market.

This thesis has two main research questions, which are as follows:

1. What are the most and least important factors that influence Finnish consumer's purchasing decision when buying milk?
2. What are the most and least important factors that influence Finnish consumer's purchasing decision when buying plant-based milk alternatives?

To answer the research questions, both primary and secondary data will be used. Secondary data, such as books, scientific articles and webpages are used to gain more in-depth knowledge about the topic. In addition, secondary sources help the author to see which factors might affect the purchase decision according to previous studies. This study uses quantitative method and hence primary data is collected through an online survey.

First chapter of the thesis will cover the consumer behavior theory called factors affecting purchase decision. The different factors affecting purchase decision; cultural, social, personal, economic, and psychological factors, will be covered. In addition, the author will discuss some of the product attributes, which may affect the purchase decision, such as package design and labelling. In this chapter two of the most popular voluntary labels used in Finland in dairy industry are introduced.

Second chapter of the thesis will be about the market of milk and plant-based alternatives. First sub-chapter will cover the dairy industry's situation and consumption of milk in Finland. In addition, some of the pros and cons for choosing to buy and use dairy milk will be explored. Second sub-chapter will discuss the reasons behind choosing to use plant-based alternatives for milk and shows the pros and cons of the industry. The third sub-chapter shortly introduces soy, oat and almond as plant-based alternatives and the benefits of each.

Third chapter of the thesis covers research methodology and the results of the study. Last part of the thesis will be conclusions, recommendations for both future research and business companies.

1. FACTORS AFFECTING PURCHASE DECISION

Consumer buying behavior refers to the buying behavior of final consumers, also known as the end customers. The individuals and households who buy products and services for their own, personal consumption, are considered as the final consumers. (Drummond and Ensor 2005, 69; Armstrong *et al.* 2019, 160) Consumers around the world vary tremendously and all these final consumers combine to make up the consumer market. For instance, age, gender, education level and other demographic factors divide final consumers into various groups with different tastes (Armstrong *et al.* 2019, 160). Drummond and Ensor (2005, 69) categorize the effects affecting consumer buyer behavior into four main categories: social, personal, psychological, and situational. According to Armstrong *et al.* (2019, 161) consumers buying behavior and purchases are influenced and affected strongly in many levels by cultural, social, personal, and psychological characteristics. In contrast Burnett (2002, 89) divides the factors into situational, external, and internal influences.

1.1 Cultural factors

Cultural factors have a broad and profound effect on consumer behavior. Buyer's culture, subculture and social class are all part of cultural factors (Armstrong *et al.* 2019, 161). Culture, the basic cause of a person's wants and behavior, collects the set of basic values, perceptions, wants and learned behavior (*Ibid*., 162). Behavior is largely learned, so society's traditions, values, and attitudes influence individual's behavior (Drummond, Ensor 2005, 70). Behavior can be learned by a member of a society from family and other important institutions such as kindergarten and school, where a child at a young age is exposed to different values (Armstrong *et al.* 2019, 162).

Cultural shifts help marketers to understand and discover what products might be wanted. The new phenomenon, a cultural shift towards greater concern about health and fitness has created a huge industry for organic foods and a range of diets (Armstrong et al. 2019, 162). Cultural norms form codes that guide behavior. Some smaller subcultures, which may be based on religion, nationality, geographical areas, or racial groups, exist and are involved in each wider culture. (Drummond and Ensor 2005, 70; Armstrong *et al.* 2019, 162) Additionally, each culture contains groups of people with shared value systems based on common life experiences and situations.

An important influence on consumer behavior comes from an individual's social class. Social class groups are heavily dependent on the cultural background of society (Drummond, Ensor 2005, 70). Social classes of a society are relatively permanent and organized divisions, whose members have similar values, interests, and behaviors. According to Buttle (1986, 102) social classification systems classify individuals or households according to criteria valued by society. Single factor does not determine social class since it is measured as a combination of variables. For instance, occupation, income, level of education and wealth can measure social class (Armstrong *et al.* 2019, 164; Buttle 1986, 102).

The nature of the societies hierarchical structure may vary, and some societies are more hierarchical than others (Drummond, Ensor 2005, 70). In some social systems, changing the social status or position is impossible and forbidden, since the members of different classes are raised to certain roles. In an open society, an individual can move from one class to another. (Drummond and Ensor 2005, 70; Armstrong *et al.* 2019, 164) In Finland people can move to a higher social class or drop into a lower one, as the lines between social classes are changeable and flexible.

As a predictor of purchasing behavior, social classification has been criticized in Western societies, since it does not take all factors into account. Purchasing patterns may vary widely withing social groups. Smaller social groups, such as friends, co-workers, and family, can also influence individuals. (Drummond, Ensor 2005, 71) These groups will be later categorized as reference groups and family.

1.2 Social factors

Consumer's groups and social networks, family, and social roles and status influence consumer behavior (Armstrong *et al.* 2019, 165). A primary group is a group in which people meet face to face and a secondary group is a group in which face-to-face interaction does not occur nor exist (Buttle 1986, 98-99). Armstrong *et al.* (2019, 165) defines membership groups as groups that have a direct influence on a person and to which a person belongs to.

A reference group is a group to which an individual may or may not belong, but which influences individual's behavior (Buttle 1986, 98-99) and operates as a direct or indirect comparison point or reference point in the formation of human attitudes (Armstrong *et al.* 2019, 165).
A person is exposed to new behaviors and lifestyles by reference groups (*Ibid.*). Those reference groups to which an individual belongs to are called either aspiration groups or dissociative groups, depending on whether the person wants to be a member or not (Buttle 1986, 99).

Aspirational groups are the ones an individual wishes to belong to, but often reference groups that people do not belong to influence people the most (Armstrong *et al.* 2019, 165). Drummond and Ensor (2005, 71) divide reference groups into formal and informal groupings but according to Buttle (1986, 99) the type of the reference group doesn't matter, since they all have a strong effect on consumer behavior and norms are learned and enforced through reference groups. In addition, reference groups can create pressure to fit, which may affect a person's product and brand choices (Armstrong *et al.* 2019, 165). Individuals will tend to exhibit buying behavior that is considered as justifiable among reference group (Drummond, Ensor 2005, 71).

Individual's behavior is significantly influenced by the role an individual plays within a group and by group norms. (Drummond, Ensor 2005, 71) Both role and status determine person's position in each group and the products people usually choose are appropriate in terms of their roles and status they hold (Armstrong *et al.* 2019, 168-169).

Our decisions are influenced by other people and consumer buying behavior can be strongly affected by word-of-mouth influence (Solomon 2019, 422; Armstrong *et al.* 2019, 165). Solomon (2019, 422) describes word-of-mouth (WOM) as product information that is transferred from one individual to another and defines it as the most important driver of product choice. Personal words

and recommendation of trusted friends, family, associates, and other consumers are generally considered more credible than those coming from more formal marketing channels (Solomon 2019, 422; Armstrong *et al.* 2019, 165) In addition, consumers place more emphasis on negative word-of-mouth than they do on positive comments (Solomon 2019, 425). Most word-of mouth influence happens naturally in situations where consumers start chatting about a brand they use or feel strongly about in a negative or in a positive way (Armstrong *et al.* 2019, 165).

Things related to food and eating are sensitive topics for many and evoke strong emotions. Many find it meaningful to apply to a group, a forum or a group that strongly supports their own ideas and ideology. (Saarnia 2020, 172-195). In today's world, online social networks, and communities, where people socialize and exchange information and opinions, creates "word-of-web". Social networks give marketers an opportunity to influence and promote products and build closer customer relationships. Harnessing the power of social networks give marketers a chance to create positive conversation about their brands. (Armstrong *et al.* 2019, 165-166)

Individual's buyer behavior can be strongly influenced by family members. According to Armstrong *et al.* (2019, 166) the most important membership reference group and consumer buying organization in society is family. Buttle (1986, 100) refers family as the primary reference group, a dynamic social institution, where the levels of power and authority of the family group are accepted by individual members and where the roles of individual members are normally established. Initially, individual learns all attitudes, beliefs, and patterns of purchasing behavior from the family (Drummond, Ensor 2005, 71).

The nature and frame of a family is constantly changing. Buying roles in relationships change with evolving lifestyles (Buttle 1986, 101). Buying behavior is shaped by the stage of the family life cycle, meaning all the steps and stages that families can go through as they mature over time (Armstrong *et al.* 2019, 169). Whatever the structure of the family, the power structure changes over time and throughout the family's life (Buttle 1989, 101). In some families, family buying decisions may be strongly influenced by the children (Armstrong *et al*. 2019, 166-168).

1.3 Personal and economic factors

According to Drummond and Ensor (2005, 71) individual's purchasing behavior will be influenced by an individual's personal attributes. Personal characteristics, which influence a buyer's decisions, include buyer's occupation, age and stage, economic situation, lifestyle, and personality and self-concept (Drummond, Ensor 2005, 71; Armstrong *et al.* 2019, 169). The goods and services people buy, change over their lifetimes and many tastes are age related (Armstrong *et al.* 2019, 169).

Grunert (Blois 2001, 123) defines lifestyle as the way in which consumers use products and services in each area to achieve and fulfill their life values. Lifestyle is a person's pattern of living as expressed in his or her psychographics, including activities, interests, and opinions, which are consumers major AIO dimensions respectively. A person's whole pattern of acting and interacting in the world is profiled by lifestyle. "Consumers don't just buy products: they buy the values and lifestyles those products represent" (Armstrong *et al.* 2019, 170).

What an individual buy and how, is also based on individual's personality (Baines *et al.* 2017; Gajjar 2013, 12). Personality, which refers to the unique psychological characteristics that distinguish a person or group can change from person to person, time to time and place to place (Gajjar 2013, 12). Both brands and consumers have personality that is usually described in terms of traits (Armstrong *et al.* 2019, 170-171). Consumers are more likely to choose a brand whose personalities match those of their own (*Ibid*.). "A brand personality is the specific mix of human traits that may be attributed to a particular brand" and "most well-known brands are strongly associated with a particular trait" (Armstrong *et al.* 2019, 170). According to Blois (2001, 124) consumers have the tendency to develop typical patterns in which they use products and services within different areas to achieve their life values.

Some authors (Ali, Ramya 2016; Qazzafi 2020) include economic factors as factors affecting consumer buyer behavior. According to Qazzafi (2020, 1207) the overall economic condition of an individual consumers effects the purchase decision and a choice of a specific brands or a product. Economic factors can include personal and family income, income expectations, savings,

consumer credit and liquid assets of the consumer (Ali, Ramya 2016, 79-80). A store and product choices result from a person's economic situation (Armstrong *et al.* 2019, 169). People with different income tend to buy different types of products and the quality of products might vary. Therefore, different ways of shopping occur among various income groups. (Burnett 2002, 91)

1.4 Psychological factors

Motivation refers to the process which leads people to behave as they do. When a need that the consumer wishes to satisfy arouses to a sufficient level of intensity, motivation occurs. Additionally, a state of tension that drives the consumer to attempt to reduce or eliminate it, is created by the need. (Solomon 2019, 173; Kotler *et al.* 2019, 155; Drummond, Ensor 2005, 72) Consumers often trouble at describing why they act as they do (Kotler *et al.* 2019, 155). Individuals' needs range from biological needs to psychological needs (Drummond, Ensor 2005, 72; Kotler *et al.* 2019, 155).

In his theory, Sigmund Freud suggests that individuals are motivated by unconscious psychological factors (Drummond, Ensor 2005, 72) and largely unconscious about the real psychological forces shaping their behavior (Kotler *et al.* 2019, 155). An individual conforms social norms as growing up and is required to repress a range of desires and passions, also known as urges (Drummond, Ensor 2005, 72). Freud assumed that people are largely unaware of their true psychological powers that shape their behavior (Kotler *et al.* 2019, 155). According to Freud's theory, individual might state a conscious reason for buying a product but at the same time a more fundamental unconscious motive might hide within the buying process (Drummond, Ensor 2005, 72). Therefore, a person's buying decisions are affected by subconscious motives that even the buyer may not fully understand (Kotler *et al.* 2019, 155).

Abraham Maslow's theory supports the idea that human needs are arranged in a hierarchy and explains why people are driven by particular needs at particular times. The hierarchy includes, from bottom to top, physiological needs, safety needs, social needs, esteem needs and self-actualization needs. These needs had to be satisfied in an ascending order and a person tries to satisfy the most important need first, which can be conveniently demonstrated as a series of steps in a flight of stairs where a person must climb one step before proceeding to the next one (Lester

2017). As each important need is satisfied at one level, the next most important needs at the next level in the hierarchy start to motivate individual (Drummond; Ensor 2005, 72; Kotler *et al.* 2019, 155) Physiological needs cover the function, comfort, and maintenance of the body at its most basic level (Wright 2009).

Each person has personal circumstances which will naturally force them to focus on their immediate needs. Particularly significant part about Maslow's theory was that he ranked these needs in a hierarchy (Wright 2009). The theory is criticized since it is not universal and is biased towards Anglo-Saxon cultures and towards values such as individualism and need for self-development (Drummond, Ensor 2005, 72). According to Baines *et al.* (2017, 45) Maslow's concept possesses logical simplicity and is a useful tool for understanding how people prioritize their own needs and therefore why people might buy what they buy. Altogether Maslow's hierarchy of needs is a controversial theory because the literature includes both criticism and support (Taormina, Gao 2013).

According to Solomon (2019, 98) sensation refers to the instant response of our sensory receptors (eyes, ears, nose, mouth, fingers, skin) to basic stimuli such as light, color, sound, odor, and texture. The process by which people choose, arrange, and interpret these sensations, is called perception. Learning happens by the flow of information through five senses: sight, hearing, smell, touch, and taste. Everyone receives, organizes, and interprets this information in an individual way. (Kotler *et al.* 2019, 156) Individual's brain receives external stimuli, also known as sensory inputs, through several channels and this raw data set up the perceptual process (Solomon 2019, 98). Selective attention describes the tendency and ability for people to screen out most of the information to which they are exposed (Drummond, Ensor 2005, 73; Kotler *et al.* 2019, 156).

Individuals are exposed to a great number of stimuli every day and different perceptions can be formed of the same stimulus by different people (Drummond, Ensor 2005, 73). In a world full of sensations, some "notes" occur naturally, others come from people. To survive this overwhelming sensory circus, people pay attention to some stimuli and turn out others. (Solomon 2019, 97-98) Sometimes the perceived stimuli don't come across in the intended way (Kotler *et al.* 2019, 156).

People are ready to act when they are motivated. Individual's own perception of each situation affects and influences reaction process (Kotler *et al.* 2019, 156). Individual process information within the limits of their current attitudes and beliefs (Drummond, Ensor 2005, 73) and tend to

retain information that support their own attitudes and beliefs (Kotler *et al.* 2019, 156). Selective retention refers to keeping the information that strengthen own attitudes and beliefs (Drummond, Ensor 2005, 73). Consumers are more likely to remember good points made about a brand they like and forget good points made about competing brands (Kotler *et al.* 2019, 156).

Selective distortion is the tendency in which the individual adjusts perceptions to fit to their current way of thinking (Drummond, Ensor 2005, 73) and the tendency of people to interpret information in a way that will support what they already believe (Kotler *et al.* 2019, 156). People avoid exposure to certain messages, actively seek out others and sometimes even expose themselves selectively to specific messages through the media they choose to read or watch (Baines *et al.* 2017, 40).

New knowledge, skills, attitudes, and values are all acquired through process called learning (Baines *et al.* 2017, 41) and this ongoing process and relatively permanent change in behavior can occur without trying (Solomon 2019, 130-131). According to Kotler *et al.* (2019, 156) changes in individual's behavior arising from experience can be described as learning.

Social learning refers to observing others' behaviour and learning from it (Baines *et al.* 2017, 41). For teens, the most influential role models are parents. Consumer skills, including materialistic values and consumption, teenagers learn from their parents. Children are socialized in their teenage years into purchasing and consuming the same brands as their parents do. (Martin, Bush 2000) Familiarity, repetition of marketing messages and a consumer's procurement of product or service information all develop consumer's knowledge. Memorization is build up through the use of symbols, people, shapes, and creatures. (Baines *et al.* 2017, 42)

Buying behaviour is influenced by beliefs and attitudes which are collected through doing and learning. A belief is defined as a descriptive thought, that an individual holds about something and may be based on real knowledge, opinion, or faith (Kotler *et al.* 2019, 157). Attitudes put people in a state of mind that they like or dislike things or move towards or away from them. If people have several attitudes about something, changing them can be challenging, since changing one attitude may require difficult adjustments in many others (*Ibid*.).

1.5 Product attributes

The importance of a package relies on its ability communicate the right product and brand values. The package has to visually stand out and achieve the appropriate level of aesthetics to be an influential one. (Nancarrow *et al.* 1998, 110) According to Underwood (2003, 62) different combinations of such structural and visual factors as brand logo, colors, fonts, package materials and other elements can provide a rich brand association to the consumer through package. Ampuero and Vila (2006, 112) found that elements such as color, packaging typography, graphic forms and packaging illustration, are all combined in different ways to transmit the desired perception in consumers' minds.

In Finland statutory labels provide basic information about the product and the packaging of milk must bear at least the following indications (Ruokatieto): (1) the name, (2) list of ingredients, (3) the amount of content, (4) the date of minimum durability or use-by-date, (5) the name, business name or auxiliary name and address of the manufacturer or packager, or of a seller established within the EU, (6) country of origin and (7) food lot identifier.

In addition to statutory labeling, there are many different optional labels available for food packaging. The optional labels can tell consumer more about the characteristics of the food, such as the origin, quality or responsibility of the raw materials. At their best, optional labels can facilitate product comparisons and consumer choices (The Consumers' Union of Finland). On the other hand, there are several pictograms, and their exact message is easily unclear to the consumer. According to Chalupa-Krebzdak *et al.* (2018, 91) in view of the nutritional differences, it is recommended that labeling requirements and public awareness initiatives be implemented to ensure that the public does not make the mistake of making plant-based milk as a direct nutritional alternative to bovine milk.

Two of the most common optional labels, which can be found from milk packages in Finland are Heart Sign (see Figure 1.) and Good from Finland (see Figure 2.).

Figure 1. Heart Sign
Source: The Consumers' Union of Finland

The heart sign indicates the nutritional quality of the product. A product with a heart sign is a better choice in its product group in terms of the amount of salt and the quality and quantity of fat.

Figure 2. The Good from Finland
Source: The Consumers' Union of Finland

The Good from Finland label is the origin mark for Finnish packaged food. It tells about Finnish raw materials and work. Milk, as such and as part of other foods, is always 100% Finnish.

2. THE MARKET FOR MILK AND PLANT-BASED ALTERNATIVES

First part of this chapter will give a short overview of the situation in Finnish dairy industry and discover the reasons for buying milk. Results from international studies help to identify the similarities and differences between the factors affecting the purchase decision of milk among consumers in Finland and all over the world. Second part of the chapter introduces the plant-based milk alternatives' market and studies some of the reasons which are behind choosing to use them. In addition, the three most sold plant-based milks, in terms of sales values in United States (Statista Research Department 2022), will be introduced shortly.

2.1. Milk industry in Finland and consumption of milk

Milk is a key part of the Nordic food tradition. In Finland, mainly cow's milk is used and international studies show that the quality of the milk produced in Finland is high (Finfood 2009). The biggest trump card in the marketing of milk is the calcium that bones need to stay strong and in good shape (Kokko 2017). From an early age, people in Finland have been educated about how milk is the only good source of calcium (Saarnia 2020, 71; Kokko 2017)

On an international level people in Finland drink a lot of milk, more than 100 liters per person per year (Saarnia 2020, 71; Statistics Finland 2021). In the 1950s up to 350 liters per person per year, which is more than three times the current situation (Saarnia 2020, 71). The use of milk in the Finnish population focuses on young age groups (Pohju 2011). To compare, in Sri Lanka where majority of the consumers are used to consumer full cream milk powder instead of fresh milk, consumption of fresh milk is not significant (De Alwis *et al.* 2009).

In 2021, 2,247 million liters of milk were produced in Finland. The number is four percent less than in the previous year and production was lower in all months. The decrease in production was partly due to the introduction of contract production at the beginning of 2021, which limited the production of dairy milk on farms. The transition to contract production affected a large part of our country's dairy farms (Natural Resources Institute Finland 2022).

Nutrition researcher Jaana Laitinen from the Finnish Institute of Occupational Health argues that milk is nutritionally very rich food and drinking milk also supports Finnish employment (Kärjä 2014). According to Raija Kara, Secretary General of the State Nutrition Advisory Board (Savolainen 2013), milk is easy to produce in Finland, is an excellent source of calcium and even affordable. According to Mäkinen *et al*. (2015, 346) cow's milk contains several key nutrients, which are challenging to replace. Brown (2019) argues that as a source of protein and calcium, cow's milk is a very good one. Some nutrients, such as vitamin B12 and iodine appear naturally. Cow's milk also includes magnesium, which is vital for bone development and proper muscle function. Lowering blood pressure is possible because of the whey and casein which are both part of cow's milk.

In Finland a regular grocery store can sell more than 50 different milks and professor of food culture Johanna Mäkelä says that reasons such as different economic situation, taste preferences, different barriers to drinking milk and different ways to prepare food, have all affected the quantity of options (Alijoki 2012). The heavy use of milk in Finland goes hand in hand with positive perceptions of milk and more than 90 percent of people under the age of 35 consider milk to be very or fairly healthy (Pohju 2011). Tapani Alatossava, Professor of Dairy Technology (Savolainen 2013) has justified the high consumption of milk with two different aspects: (1) the production is profitable especially when two thirds of agricultural income comes from dairy farming and (2) the official nutrition recommendations are based on the desire to promote the sale of raw materials that are important to Finland.

The consumption of drinking milk has declined in recent years but correspondingly consumption of other dairy products has increased. In Finland the supply of plant-based foods has increased, and consumers have accepted them as an option to dairy products. (Jalonen 2020) Same trend can be seen in America, where people for the past 50 years, have been drinking less and less milk. Milk is no longer the go-to drink. (Business Insider 2021) The disappearance of milk glasses from dining tables is a long-term trend. According to specialist Erja Mikkola from the Natural Resources

Institute Finland (Laakkonen 2019), some decades ago urbanization and the decline of dairy farms affected the milk consumption of Finns. Later, different food trends and the climate debate have led people to reduce their milk consumption.

According to Pohju (2011) skimmed milk (fat percent 0,0-0,5% in Finland) is the most used quality of milk by Finns in almost all age groups. According to the study done in Finland (Niva *et al.* 2018, 4), especially in staple foods such as milk, domestic alternatives were particularly favored. In Finland milk is perceived as a fresh product and then it is thought that it should come close and come from your own country. It is downright patriotic to drink Finnish milk. It shows the idea of national identity and milk, and how they relate to each other. (Alijoki 2012) The results of the study (Niva *et al.* 2018, 5) showed that the value of domestically produced food is high for Finnish consumers.

According to the study (Jalonen 2020) concurrent and versatile use of dairy products and plant-based alternatives occurs among the consumers. The dairy industry has come face to face with the benefits of plant-based substitutes over the dairy industry (Paul *et al.* 2019, 3018). In Finland, consumers choose dairy products mostly because of their price, taste and familiarity, and sometimes they may be purchased for other people besides consumers themselves (Jalonen 2020).

According to research from Celik Ates and Ceylan (2010) key factors affecting the purchase of milk were income, age and occupation. In Croatia Krešić *et al*. (2010) research the motives for selection of dairy beverages and found that sensory appeals were the most important motivational factor; taste is the most important choice motive followed by health, origin of the product was 3rd and price 5th important factor. The key factors affecting the consumption and purchase of fresh milk among the Mid-country consumers in Sri Lanka are package, brand, appearance, taste and price (De Alwis *et al.* 2009). The most important household characteristics affecting the purchase decision of fluid milk in Turkey are number of children, household size, educational level and income (Hatirli *et al.* 2004). Top three reasons motivating Slovak consumers to purchase milk are taste, health and usefulness (Kurajdová *et al.* 2015).

In Finland Valio is the largest, most significant, and most productive dairy processor in the market. Valio has been blamed for creating a monopoly where research is very much dependent on its will. As a large company, it funds almost all the research on milk, and if Valio don't want to put their money on a topic, the whole research is unlikely to emerge. (Savolainen 2013; Kokko 2017)

According to Alatossava (Savolainen 2013) the link between children's diabetes and the high use of dairy products would like to be researched in Finland. However, no research into causal links is taking place, as the dairy industry is not interested in collaborating with public research institutions (Savolainen 2013; Kokko 2017).

Link between use of milk and serious conditions such as increased risk of cancer, diabetes, skin problems, obesity and elevated cholesterol has been found (Kokko 2017; The Humane League 2021). Jyrki Virtanen, a nutritional epidemiologist at the University of Eastern Finland, argues that only a very high milk intake can be bad, but there's no research suggesting that moderate intake is harmful (Brown 2019). Switching from cow's milk to plant-based alternatives can be justified with three different aspects: health, environment, and the cow's health (The Humane League 2021).

2.2. Plant-based alternatives to milk

The supply of beverages that have previously replaced traditional dairy products has grown rapidly. More and more Finns are trying plant-based alternatives to ordinary milk, and sales of plant-based alternatives have increased in recent years. Consumer eating habits in Finland are changing, and plant-based products are not believed to be a transient trend but are expected to remain part of Finnish food culture, without threatening the status of ordinary milk (Korhonen 2017; Pennanen 2018).

Industry of plant-based milk alternatives have been in rapid growth flow since the early 2000s (Cornucopia Institute 2019, 3). Current market is fascinated by the huge potential of expansion options (Paul *et al.* 2019, 3018) and now a never-ending number of plant-based drinks are entering the supermarkets selection (Cornucopia Institute 2019, 3). Plant-based milk alternatives are a growing trend and a rising segment in food product development (Sethi *et al*. 2016, 3408). In Finland, plant-based drinks have become fashionable (Korhonen 2017). In UK, sales of so-called alternative milk are growing faster than sales of traditional milk (Buibourg, Briggs 2019).

The presence of various bioactive phytochemicals, lack of cholesterol, high energy input to production, limited availability of milk in some areas, the emergence of a vegan diet, and limited resources, are the driving forces of the non-dairy industry (Paul *et al.* 2019, 3018). Reasons such

as consumer demand, aggressive marketing campaigns and high profitability are behind this growth (Cornucopia Institute 2019, 3).

In a modern society, factors such as cow milk allergy, lactose intolerance, calorie concern and prevalence of hypercholesterolemia, have influenced consumers towards choosing cow milk alternatives (Sethi *et al*. 2016, 3408; Cornucopia Institute 2019). In Finland, the desire to experiment, allergies, environmental awareness, and the general welfare trend drive people to try different options (Korhonen 2017). Taste, health-promoting effects, consumer's habits, and interest in new products, are reasons for choosing plant-based beverages and other dairy like products (Jalonen 2020). According to Aschemann-Witzel *et al.* (2020, 3126) when choosing plant-based products, factors such as convenience, tastiness, and simple ingredient list matters most for the consumers. According to Cornucopia Institute (2019, 15) some consumers are most interested in replacing taste and others can be concerned with finding the most nutritional alternatives, when choosing plant-based alternatives over dairy milk. In research from McCarthy *et al*. (2017, 6129) for plant-based beverages, sugar level was the most important attribute, followed by both plant source and package size.

Plant-based alternatives are chosen among consumers as a part of diet for medical reasons or as a lifestyle choice (Mäkinen *et al.* 2015, 339; Cornucopia Institute 2019, 3) and preference to vegan diets has turn people towards exploring the options and different alternatives available (Sethi *et al.* 2016, 3408). Dietary needs are an important factor for consumers, but not only nor all plant-based beverages are being consumed by vegans, vegetarians or people with allergies and sensitivity to dairy products (Silva *et al.* 2020, 9).

Even though majority of milk alternatives contain functionally active components with health promoting properties, many of these plant-based alternatives lack nutritional balance compared to dairy milk (Sethi *et al.* 2016, 3408). According to the research (Mäkinen *et al.* 2015, 345) the limiting factor in a process of consumer acceptance of plant-based milk substitutes, might be the willingness of the mainstream consumer to try unfamiliar foods that are perceived as unappealing. Increasing business opportunities are in the horizon in context of policy and market trends but the business to succeed, consumers beliefs must change even further, consumers need more understanding, and their perception needs to develop (Aschemann-Witzel *et al.* 2020).

The choice of plant source, processing of the raw material and fortification affects the nutritional properties of a plant-based alternative (Mäkinen *et al.* 2015, 343). According to Chalupa-Krebzdak *et al.* (2018, 91) a high degree of variability in the nutrient composition of plant-based milk alternatives causes differences in beverage formulations between different brands. This can happen even between plant-based beverages made with the same plant base (Mäkinen *et al.* 2015; Chalupa-Krebzdak *et al.* 2018, 91). In addition, the presence of other ingredients, such as sweeteners, additives, and oil, affect the nutritional properties, which vary greatly on each brands' finished products (Mäkinen *et al.* 2015, 343; Cornucopia Institute 2019, 3).

Chalupa-Krebzdak *et al.* (2018, 91) advise consumers not to think of plant-based milk alternatives as fully nutritious alternatives to dairy milk. Consumers should familiarize themselves with the nutritional profile of plant-based milk alternatives and if needed, make dietary changes to replace possible nutrients resulting from the replacement of dairy milk with plant-based alternatives. This is necessary to avoid potentially serious diseases due to nutritional deficiencies. In contrast Richie (2022) argues that for a person who has a diverse diet and doesn't rely on milk as an important source of protein, the replacement process from a nutritional point of view is unlikely to become a concern.

Consumer awareness is important, especially when plant-based milk alternatives are used to replace cow's milk in the diet, since some of the products have extremely low protein and calcium contents (Mäkinen *et al.* 2015, 339). In Finland, Executive Vice President of the Vegan association Sari Komulainen (Savolainen 2013) argues that drinking milk is not necessary, especially when the same daily dose of calcium can be obtained by eating three handfuls of almonds. Calcium and vitamin-D, which makes cow's milk a better choice, doesn't occur naturally in most plant-based alternatives (O'Sullivan, Cunningham 2020). Executive Vice President of the Vegan association, Sari Komulainen argues that many oat and soy milks, which are sold in the market, are supplemented with calcium (Savolainen 2013).

Plant-based milk and non-dairy milk alternatives can serve as an inexpensive alternative and cheaper option to unprivileged economic group in developing countries. In some countries where mammal milk, including cow's milk, is limited and expensive, plant-based substitutes are considered as more affordable option. (Mäkinen *et al.* 2015, 339) Places where cow's milk supply is insufficient, plant-based alternatives offer relief. Plant-based milk alternatives are not only used

as a beverage but also has been added extensively to recipes as an ingredient in western countries. (Sethi *et al.* 2016, 3409)

Ethical and ecological reasons affect the decision making of consumers (Jalonen 2020). From environmental and sustainability point of view, the debate is strong. In recent years, plant-based dairy alternative beverage sales have increased and are often advertised on a platform of sustainability and environmental commitment (Schiano *et al.* 2020, 11228). In research from Boaitey and Minegishi (2020) results show that respondents who were primarily concerned about health, farm animal welfare (FAW) and the environment were more likely to purchase and consume plant-based milk alternatives more frequently. In U.S the industry has been hiding the ways cow's milk is produced and its environmental costs to generate profits at any cost (The Humane League 2021).

There is a growing awareness that our carbon 'footprint' is affected significantly by our own diet and food choices. Overall, the footprint of foods of animal origin is generally larger than that of plant-based foods. (Richie 2020) In Finland, even more consumers are making their choices on the food shelf on an ecological basis. Still, the overall assumption in Finland is that the environmental impact of a plant-based milk alternative is lower than that of cow's milk (Pennanen 2018). According to Cornucopia Institute (2019, 15) environmental reasons can be a big part of the decision process. Some consumers think animal welfare as their main concern, but some might also be looking for the lowest carbon footprint.

Valio's product development director Tuomas Salusjärvi argue, that Finnish milk beats soy and almond milk because of its ecology (Pennanen 2018). However, the numbers (Poore, Nemecek 2018) prove Salusjärvi wrong. In terms of the use of land, freshwater use, greenhouse gas emissions and eutrophication all of the alternatives have a lower environmental impact than dairy (Richie 2022). Plant-based alternatives have significantly lower environmental impacts compared to cow's milk across all metrics (See Appendix 1-4.) These metrics doesn't provide a clear winner among plant-based alternatives, since they all have their pros and cons. Appendix 1-4 shows the different environmental impacts of dairy, oat, soy and almond milk.

Salusjärvi (Pennanen 2018) justifies using cow's milk by blaming different plant-based drinks for their transportation emissions. Richie (2020) in contrast argues that the greenhouse gas (GHGs) emissions coming from transportation of the food make up a very small amount of emissions. Any

plant-based alternative to milk is better for the planet, especially when dairy industry is a major source of GHGs. Best options for land are oat and hemp. In addition, best for water conservation are soy and oat. (McCarthy 2021) "What you eat is *far more* important than where your food traveled from" (Richie 2020).

According to Mäkinen *et al.* (2015, 346) plant-based alternatives require less land to produce, but the direct comparison of the GHG emissions is challenging because of the differences in nutritional profiles of both dairy and plant-based alternatives. Valio's product development director Tuomas Salusjärvi (Pennanen 2018) admits that comparing the carbon footprint of domestic oat drinks and milk is then a much more complex matter.

McGivney from The Guardian (2020) made an environmental ranking of plant-based alternatives, based on interviews with experts, from best to worst: (1) Oat, (2) Soy, (3) Hemp and Flax, (4) Hazelnut, (5) Rice, (6) Almond and (7) Coconut. Mäkinen *et al.* (2015, 346) judges based on very limited literature, but makes a conclusion that plant milk substitutes have lower impact on the climate.

Plant-based substitutes can offer a sustainable alternative to dairy products in the future (Mäkinen *et al.* 2015, 339). Still today, features such as lower protein content, calcium availability, higher GI values, and potential presence of anti-nutritional factors make plant-based milk alternatives nutritionally secondary to dairy milk (Chalupa-Krebzdak *et al.* 2018, 91). "Whether or not plant milks really are a healthy substitute for cow's milk is a matter of fierce debate, and not an inconsequential one" (Franklin-Wallis 2019).

From price point of view, the regular cow's milk is cheaper to customer compared to plant-based options. Based on author's own observation in March 2022, cow's milk prices per liter in Finland vary between 0,66 and 1,89, depending on the brand, quality, and type of milk. Plant-based alternatives to milk were priced between 1,45 and 3,19 per liter, again depending on the brand, quality, and type of plant.

2.2. Soy, Oat and Almond as plant-based alternatives for dairy milk

The first plant-based milk was soy milk, which was introduced in China about 2000 years ago (Sethi *et al.* 2016, 3411). Soy milk is the most widely used plant-based milk substitute (Mäkinen *et al.* 2015, 339) and serves the purpose of providing essential nutrients as a source of monounsaturated and polyunsaturated fatty acids (Sethi *et al*. 2016, 3411). These factors are considered good for cardiovascular health.

Soy milk serves especially the populations where the milk supply is insufficient. Within populations, where milk protein allergies and lactose intolerance are common, soy milk has gained popularity. (Sethi *et al.* 2016, 3411) Paul *et al.* (2019, 3008) refers soy milk as a low-cost, refreshing and nutritious beverage with a variety of functionally active components responsible for its beneficial interactions within the body. Soy milk has as much protein as cow's milk and is a great source of potassium (O'Sullivan, Cunningham 2020).

Almost every month new, widely advertised, oat products appear in stores. These products create a picture of better health for the consumers (Saarnia 2020, 98). In Finland, oats are the only domestic cereal, which has received a number of approved opinions from the European Food Safety Authority (EFSA) under strict criteria (*Ibid*.). In the ever-growing market oat milk plays an important role and competes strongly with various substitutes and dairy milk (Paul *et al.* 2019, 3011).

Consumers in Finland have taken over oat-based products, which are by far the most popular plant-based products among them (Jalonen 2020). As a source of quality protein with good amino acid balance oat is ideal (Saarnia 2020, 101). Oat is a promising new raw material, which includes dietary fibres and high nutritive value, which has in turn increased the interest towards it as an ingredient (Sethi *et al.* 2016, 3409-3411). ß-glucan is the main reason behind the interest towards oat (Saarnia 2020, 101) and as a functional active component oat has neuraceutical properties (Sethi *et al.* 2016, 3409). Oat beta-glucan has been shown to lower cholesterol and postprandial blood sugar (Saarnia 2020, 98), but not all oat-prefix products are automatically good for lowering cholesterol (*Ibid.,* 101). For example, a glass of oat milk contains zero to half a gram of beta-glucan, depending on how much fiber is in that specific oat milk (*Ibid*., 100-101).

Dried fruits and nuts have become famous mostly because of their potential health benefits and consumers promoting healthy lifestyle have adopted them as an essential part of diet (Sethi *et al*. 2016, 3412). Almond is considered as a nutrient dense product and serves as a naturally good source of vitamins (Sethi *et al*. 2016, 3413) but compared to dairy, almond milk is low in protein (O'Sullivan, Cunningham 2020). Almond is known for being an excellent source of vitamin E on the form of both alpha-tocopherol and manganese. E-vitamin is a special example of a vitamin which cannot be synthesized by the body and need to be supplied through diet or supplements. (Sethi *et al*. 2016, 3413)

When buying almond milk, consumers should seek for products with the highest percentages of nuts to make the most of the health benefits of almonds (Cornucopia Institute 2019, 9). Calcium, magnesium, selenium, potassium, zinc, phosphorus, and copper are other examples of the nutritious richness of almonds. In addition to all these benefits, almond has been discovered to help with lowering serum cholesterol level. (Sethi *et al.* 2016, 3413) In the US almond milk is the most popular plant-based alternative for cow's milk (The Humane League 2021). The most desirable plant source according to the research was almond milk (McCarthy *et al*. 2017, 6130).

The three most sold plant-based milks, in terms of sales values, in United States are almond, oat and soy milk (Statista Research Department 2022). Any of these three milks; soy, oat or almond is nutritious enough to be part of balanced diet. In terms of the health of the planet, choosing either oat or soy milk, is the best option. (O'Sullivan, Cunningham 2020) The consumer decision regarding choosing plant-based alternatives over dairy milk are complex and extremely personalized (Cornucopia Institute 2019, 15).

3. RESEARCH METHODOLOGY AND RESULT

This chapter will cover the used research methods and how data for the research was collected. Next will be the demographics of the respondents, followed by the results of the study as part of data analysis. Later in the chapter the author will discuss the results and compare them to previous studies.

3.1 Research methods and data collection

Two main approaches were used to conduct the research. To gain deeper knowledge and more fundamental understanding about the theory, author studied literature for the first part of the thesis. Secondary data was collected from books, field-specific articles, and webpages. Results of previously done research and conclusions from articles were later used for comparison with the author's own study. To be able to conduct the online questionnaire, author had to gain first-hand knowledge and understand the most essential elements of the selected theory.

Primary data was collected through a quantitative method and applied in the form of an online questionnaire. To create a questionnaire Google Inc.'s online tool Google Forms was used. Online surveys have many advantages, such as speed and reach, ease, cost, flexibility, and automation. Construction of is flexible and participants can quickly set up and complete an online survey, especially when distributed on social media (Ball 2019, 414).

A non-probability sampling method called convenience sampling was used to gather the primary data. Convenience sampling attempts to collect the sample from the population that is closer to the researcher. As a sampling method convenience sampling is the least expensive one, hence being an economic friendly option to a student who's budget is low. With the limited time available, convenience

sampling is the least time consuming of sampling methods. It must be elaborated, that this form of sampling has some serious limitations, one of them being that convenience samples are not representative of any definable population (Malhotra 2006, 341).

Author shared the link to the questionnaire to her own various public social media channels, including Facebook and Instagram, and recruited respondents through these social media platforms. It was elaborated to the potential respondents that the questionnaire is completely voluntary, and the results will be used confidentially only as part of the formation of the bachelor's thesis. The questionnaire accepted answers between 19.3.2022 and 24.3.2022. To possibly increase the response rate and full completion of the online questionnaire, the questionnaire was open longer period (Callegaro *et al*. 2015). The questionnaire was in Finnish to possibly increase the response rate.

The questionnaire was divided into four sections and included 29 questions in total. Question types of the online questionnaire varied, and author used single choice questions, multiple choice question, Likert scale and open-ended questions. First section was about plant-based milk alternatives and included seven questions. Second section was about milk and milk consumption and included five questions. Third section was about both plant-based milk alternatives and cow's milk and included six questions. Fourth section asked about respondents' demographics and included 11 questions. Since the questionnaire conducted was in Finnish, author translated the questions in English. The online questionnaire is represented in Appendix 5 with the results.

3.2 Demographics of the respondents

Online questionnaire had 262 respondents in total. Demographics section of the questionnaire included 11 questions from which ten were mandatory and one voluntary. Mandatory questions covered respondent's age, official gender, occupational status, estimated annual income or pension, estimated monthly consumption on groceries, lactose-intolerance, diet, number of visits in grocery stores, stores in which people visit and a region from which a respondent is from. One and only voluntary question offered respondents an opportunity to wrote about their gender identity, in case if they did not identify themselves as their official gender.

Most answers came from Southwest Finland (183), Uusimaa (33) and Pirkanmaa (10). Other answers (36) came equally from other regions. The average age of respondents was 36 years old. The response rate was highest in group 18-29 where 115 responses were gathered in total. Respondents were asked to select their official gender. In this case the official gender refers to a gender entry entered in the population register, which in Finland can be a female or a male. Sometimes there is also talk of legal gender (defined by the Finnish Ministry of Social Affairs and Health). Figure 3 shows the division between respondents' official gender and age groups (see Figure. 3).

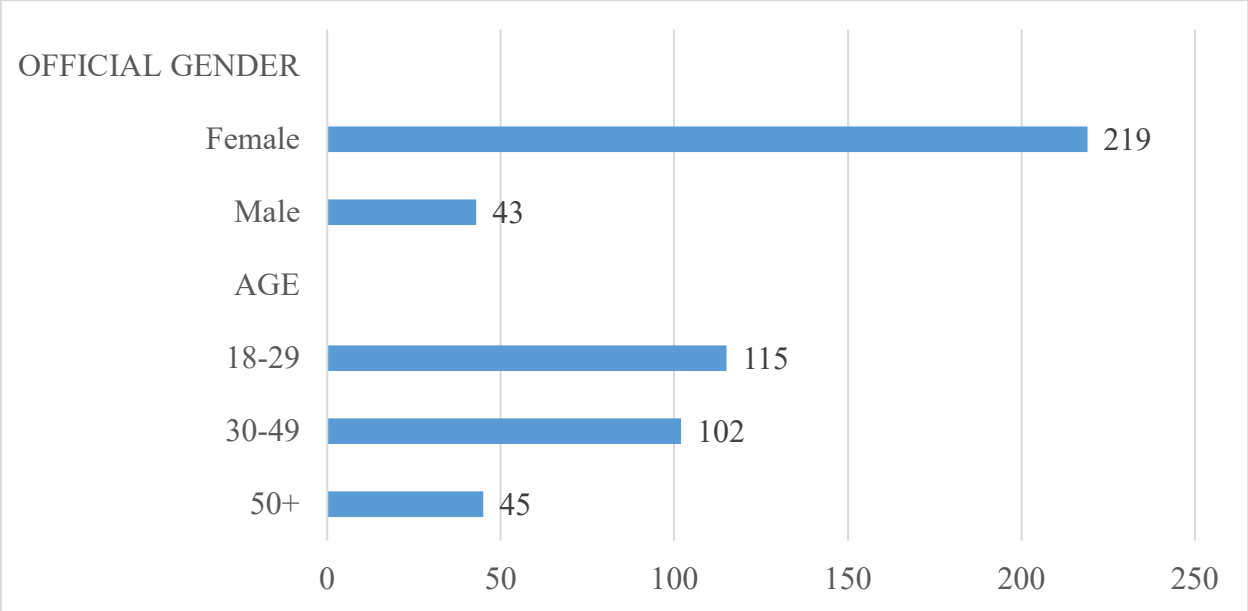

Figure 3. Respondents' official gender and age groups
Source: Author's calculations based on data from Appendix 5

Out of all (262) respondents 23% (59 respondents) had estimated yearly income or pension of 0-10000€. This can be explained with the large number of respondents in youngest age group (18-29 years old), where majority (60%) of the respondents were students. Estimated yearly income or pension of 10001-20000€ had 18% of the respondents. Of the respondents in age group 30-49 years old 81% were employed, hence the diversity in the estimated yearly income or pension. Figure 4 shows the division between the different age groups and estimated yearly income or pension (see Figure 4).

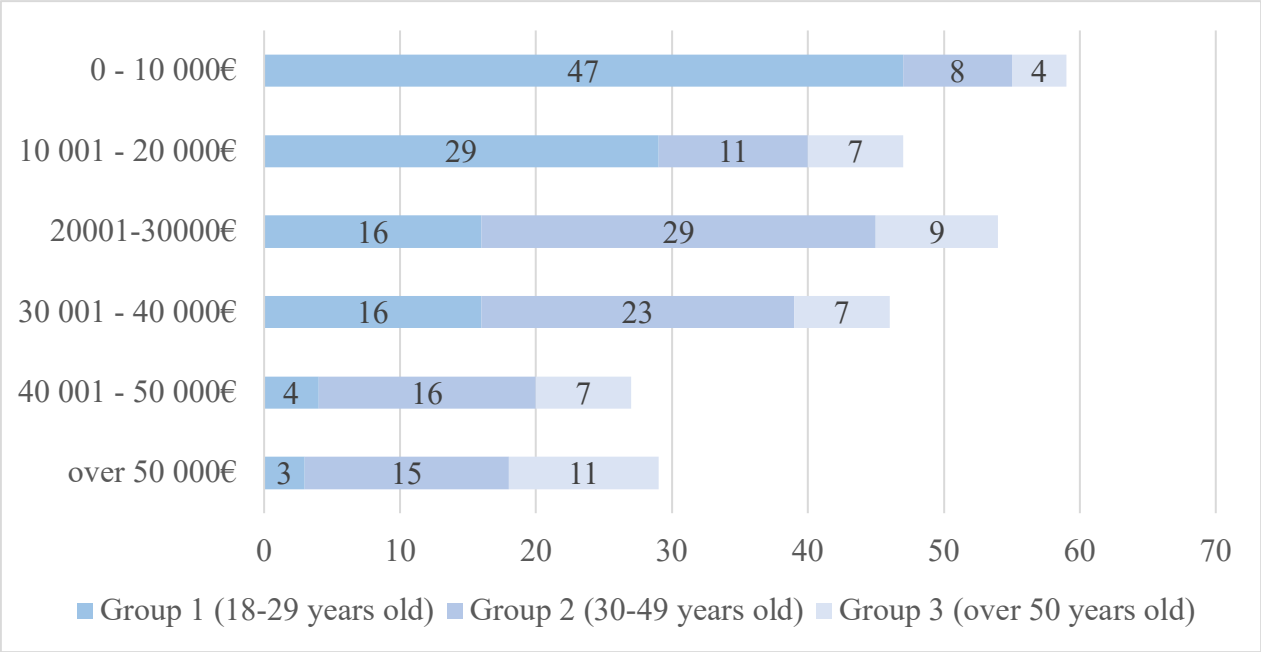

Figure 4. Different age groups and the division between estimated yearly income or pension
Source: Author's calculations based on data from Appendix 5

In age group 18-29 years old 39% of the respondents estimated to spend monthly on groceries 201-300€. In age group 30-49 years old 38% of the respondents estimated to spend monthly on groceries over 400 euros. In age group over 50 years old 33% of the respondents estimated to spend monthly on groceries 301-400€. The estimated number spend on groceries monthly might vary based on respondents' occupational and economic situation, which both can partly explain the monthly spending on groceries. In addition, whether person lives alone or with someone might either increase or decrease the spending. Figure 5 shows the estimated monthly spending on groceries (see Figure 5).

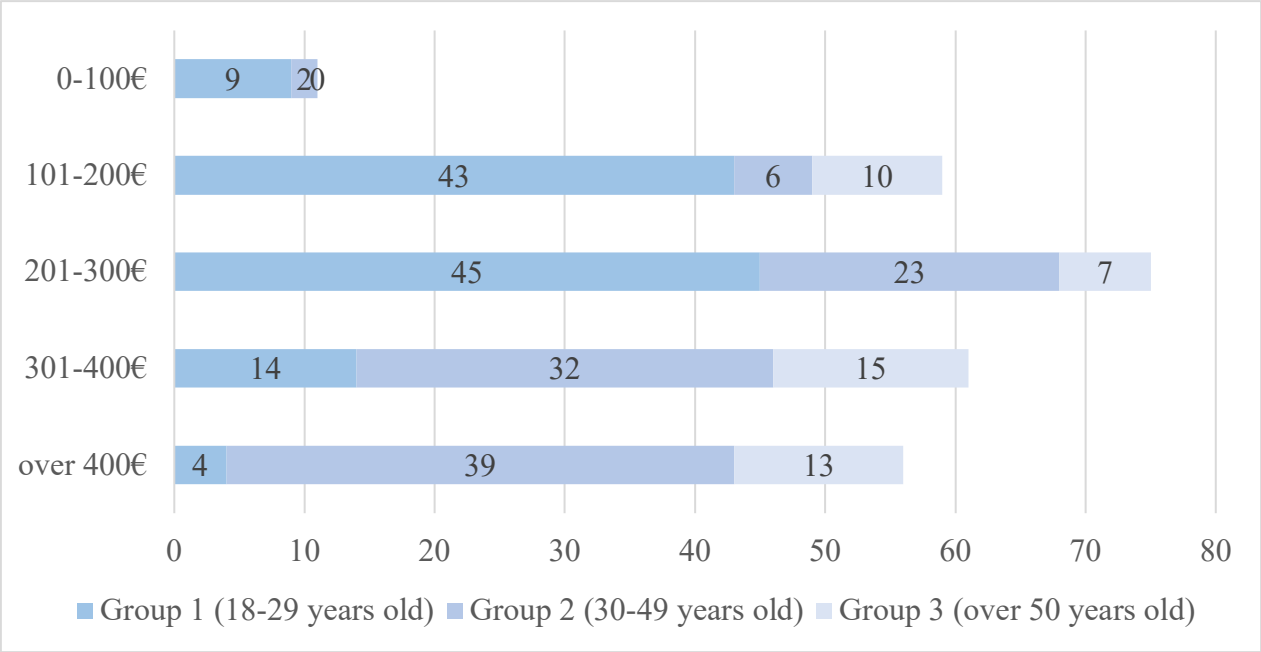

Figure 5. Estimated monthly spending on groceries
Source: Author's calculations based on data from Appendix 5

Respondents were asked to select the three most common grocery stores that they visit. In case of not visiting the store but using either the home delivery or store's pick-up service, respondents were asked to select the store whose services they use. Most visited and used grocery stores among respondents were K-Citymarket (47%), Prisma (47%) and Lidl (39%).

3.3 Data analysis

The first part of the questionnaire was about plant-based alternatives for cow's milk. From the respondents (262) 85% had bought some type of plant-based milk during their life. Questionnaire listed some plant-based alternatives for milk, from which respondents had the opportunity to select the ones they have bought. In case the respondent hadn't bought plant-based milk alternative, they had the opportunity to select the option 'I have not bought plant-based milk alternatives'. The most popular plant-based alternatives for milk among the respondents where oat (37%), almond (18%), soy (18%) and coconut (16%).

Questionnaire listed eight different brands sold in Finland, which sell some type of plant-based milk alternative. Respondents were asked to select the one they buy most. Most bought brands were Oatly (41%), Alpro (20%), Elovena (13%) and Oddly Good (12%). Most bought brands

among the respondents were the biggest and most known ones. The retail chains 'own brands received only few responses despite their cheaper price. Degree of domesticity was the sixth most important factor for respondents, but still from the most bought brands only Elovena and Oddly Good sell products which are made in Finland from Finnish ingredients.

Respondents where also asked from which channels they get most information of plant-based milk alternatives. Most information came from friends (16%), Instagram (15%) and tv-commercials 14%). Only 0,4% of the respondents was looking for the information from the package itself.

To see which factors affect the purchase decision, author listed 19 different factors. Respondents had to evaluate the importane of each factor on scale 1-5; one meaning that the factor is not important at all, and five meaning that the factor is very important. Majority of the respondents (174 of 262) valued taste as 5 (on scale 1-5; 5= very important) hence giving taste the highest average 4,25 and making it the most important factor. Second highest average was for earlier experience (3,95) and third highest average on availability of the product in store (3,58). The three least important factors with lowest average where food trends (1,96), new product to the market (2,03) and popularity of the product (2,11). From Figure 6 (see Figure 6.) can be seen that brand (with average of 2,50) is among five least important factors.

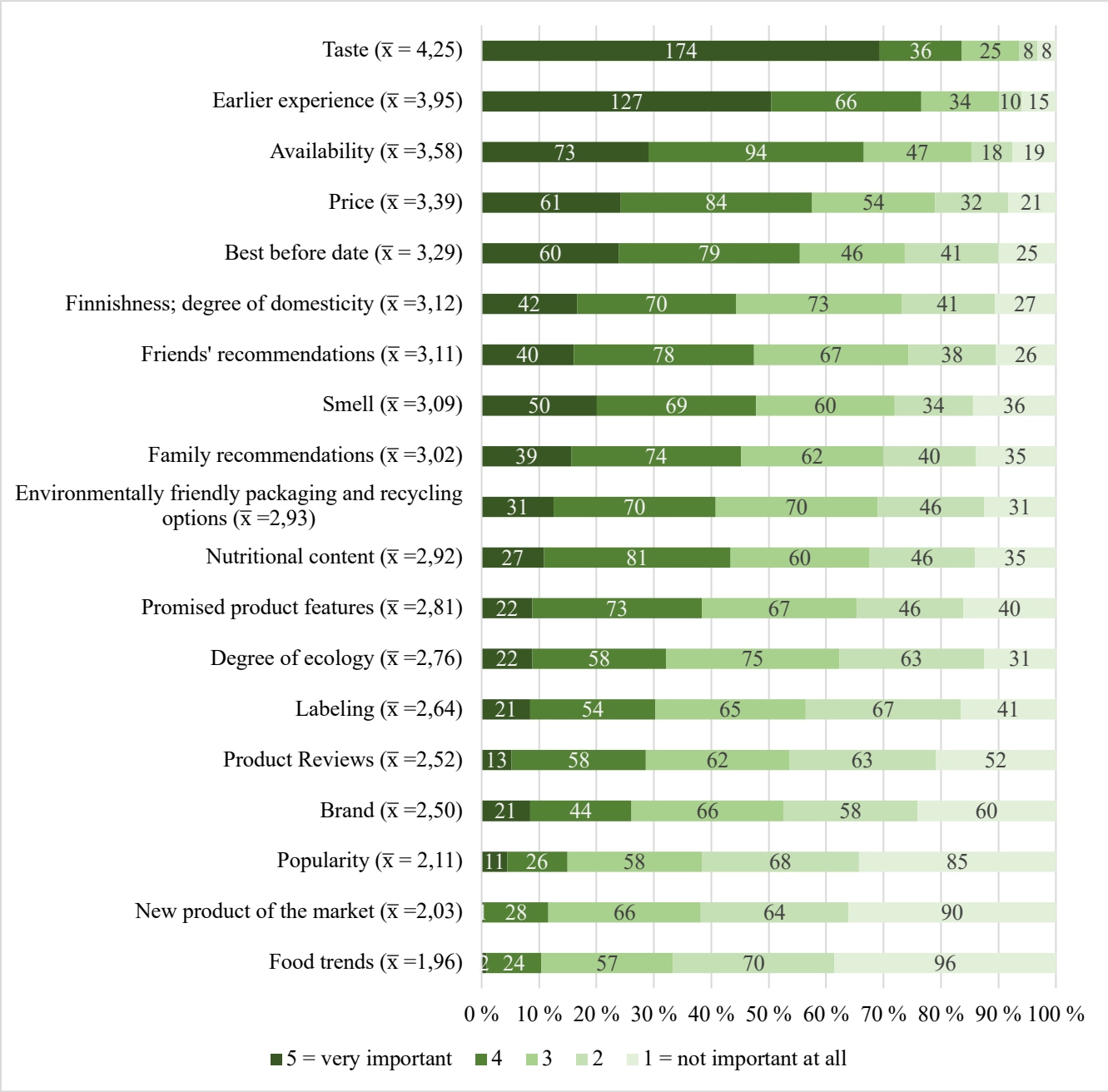

Figure 6. Factors affecting the purchase decision of plant-based milk alternatives among Finnish Consumers

Source: Author's calculations based on data from Appendix 5

Overall, the importance of different factors for respondents was more "both this and that" rather than "either this or that". Meaning that, many of the factors, got votes more on scale 2-4 rather than votes only on extremes, 1 and 5 (see Figure. 6)

Author used a Pearson correlation matrix, from which the values for Pearson correlation coefficient values can be seen. Perfectly negative linear correlation is -1, 0 stands for no linear correlation and value 1 means perfectly positive linear correlation. Author used three different colors to mark the possible linear correlation: red (-1), white (0) and blue (1). As seen from the tables in Appendix 6 and in Appendix 7 (See Appendix 6 and Appendix 7.) only blue colors are shown. The darker the blue, the stronger is the positive linear correlation between the factors.

In terms of plant-based milk alternatives, the strongest positive linear correlation is between family recommendations and friends' recommendations (0,79) and between environmentally friendly packaging & recycling options and degree of ecology (0,76). The weakest positive linear correlation is between smell and brand (0,07) and between degree of domesticity and popularity (0,10). The Pearson correlation matrix of the factors is presented in Appendix 6.

Respondents were asked to assess nine statements related to consumption of plant-based milk alternatives (Strongly disagree – Somewhat disagree - Neither disagree nor agree – Somewhat agree – Strongly agree). All respondents (262) assessd all of the statements. Majority of the respondents somewhat disagree (24%) or strongly disagree (43%) with the statement that plant-based alternatived to animal milk are foreign to them. From the Figure 7. (see Figure 7.) can be seen that majority do strongly agree (63%) or somewhat agree (23%), that they recommend plant-based alternatives to their friends. Out of all respondents 49% do strongly agree or agree with the stament that their friends recommend plant-based milks for them. Plant-based milks are bought based on their taste, but not because of their price. In terms of environmental aspects, 23% of the respondents neither agree nor disagree with the statement. In addition, 28% of the respondents neither agree or disgaree in case of statement regarding the healthiness of plant-based milk. In terms of desire to try new things, the opinions among respondents varied a lot. Figure 7. shows how each of the statements were assessd among respondents.

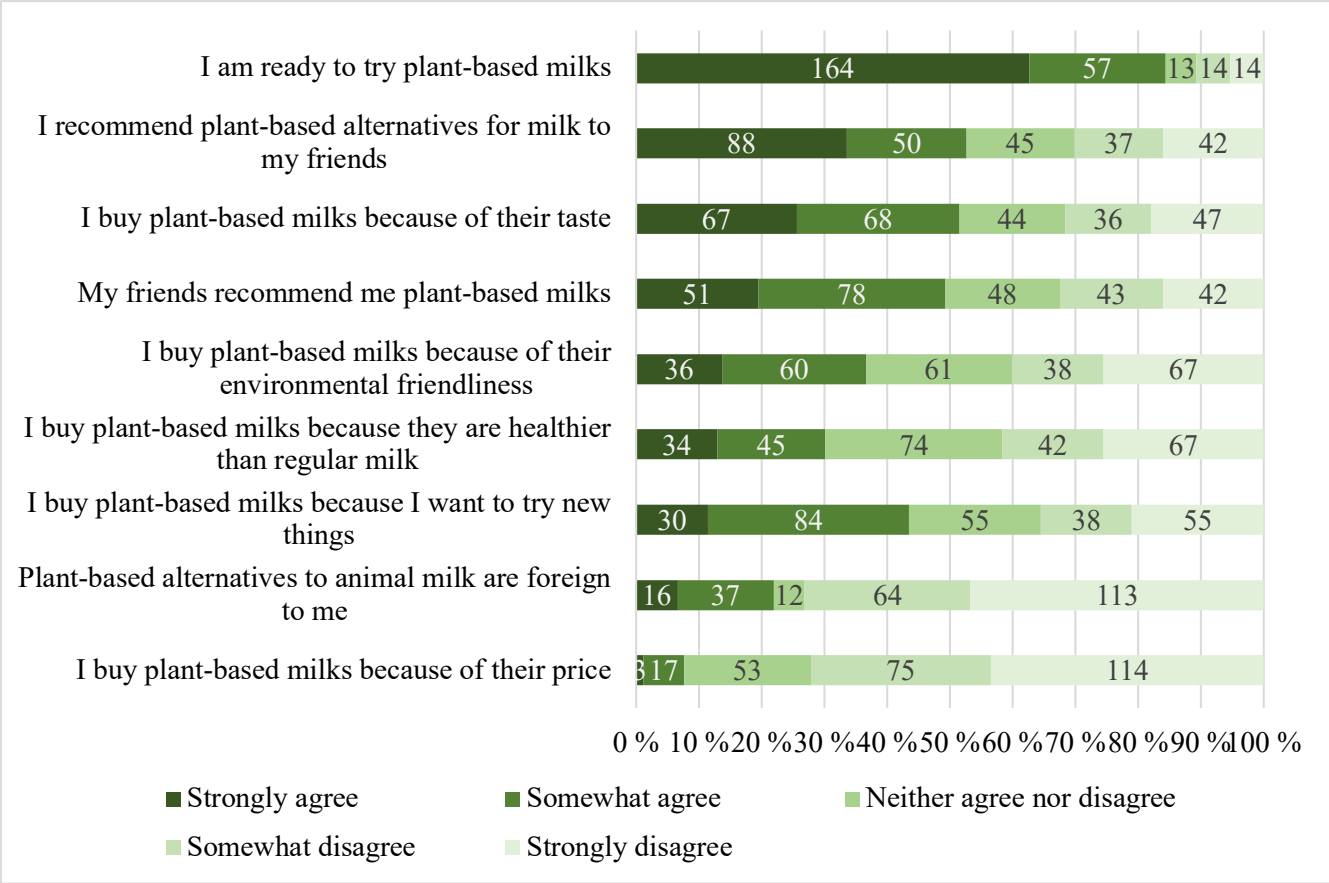

Figure 7. Assessment of the statements regarding consumption of plant-based milk alternatives
Source: Author's calculations based on data from Appendix 5

The second part of the questionnaire was about milk and milk consumption. From the respondents 78% bought cow's milk and 22% didn't. The most bought milk types among respondents who buy milk were semi-skimmed milk (1,5-1,8% fat) and fat free milk (0,0% fat). The percentages used here, are the ones used in milk sold in Finland. From the respondents who buy milk, 51% buy Valio. Other brands covered the remaining 49% and from these the most bought brand was S-Group's Kotimaista with 25%.

Respondents where also asked from which channels they get most information about milk. Most information was received from tv-commercials (19%), news (16%, both online and tv-version) and cooking magazines (12%). Only 1,3 % of the respondents was looking for the information from the package itself.

To see which factors affect the purchase decision, author listed 19 different factors. Respondents had to evaluate the importane of each factor for them on scale 1-5; one meaning that the factor is

not important at all, and five meaning, that the factors is very important. Compared to plant-based alternatives, more factors were either very important of not important at all. Incase of many factors, opinions were extreme (either 1 or 5), rather than neutral.

Plant-based milk alternatives and dairy milk do share the top 2 most important factors, taste and earlier experience. In terms of plant-based milk alternatives, recommendations coming from both friends and family as well as price and brand are more important than in terms of buying dairy milk. In terms of smell and availability of both dairy milk and plant-based milk alternatives, the difference in importance was small. Degree of domesticity is more important when buying dairy milk.

Out of all respondents (262) 127 rated taste as 5 (on scale 1-5; 5=very important) hence giving the taste the highest average 3,48 and making it the most important factor. Second highest average was for earlier experience and on degree of domesticity, which both had the average of 3,37. The three least important factors with lowest average where food trends (1,47), new product to the market (1,51) and popularity of the product (1,60). Figure 8 shows the importance of each factor and how factors were rated on scale 1-5 (see Figure 8).

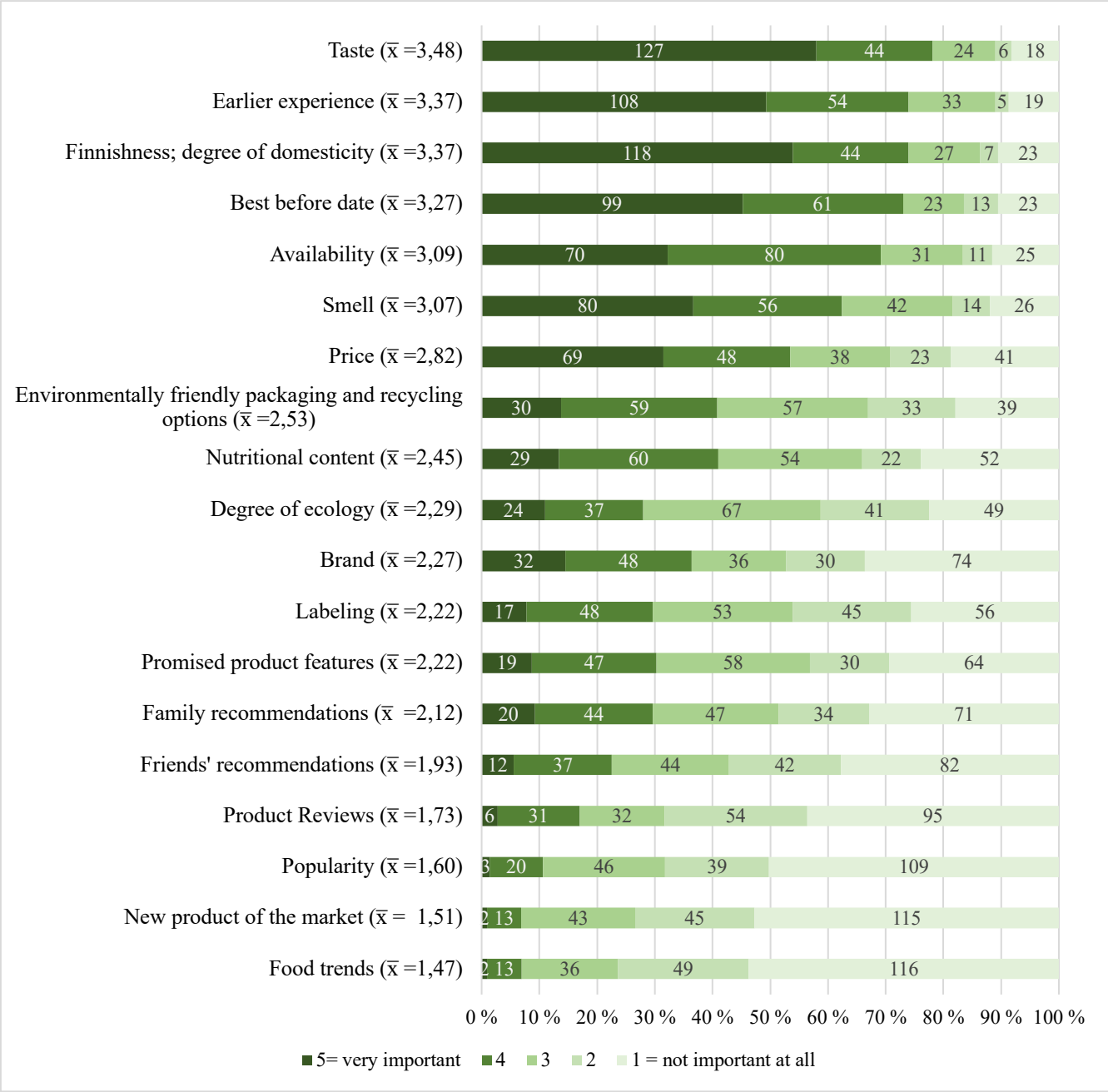

Figure 8. Factors affecting purchase decision of milk among Finnish consumers
Source: Author's calculations based on data from Appendix 5

In terms of dairy milk (cow's milk) the strongest positive linear correlation is between family recommendations and friends' recommendations (0,87) and smell and taste (0,77). The weakest positive linear correlation is between price and brand (0,03) and between food trends and environmentally friendly packaging and recycling options (0,11). The Pearson correlation matrix of the factors is presented in Appendix 7.

Respondents (262) were asked to asses four statements related to milk consumption (Strongly disagree – Somwhat disagree - Neither disagree nor agree – Somewhat agree – Strongly agree). People who do not consume milk, where asked to assess the statements as well and in case they did not have an opinion, they were asked to select neutral 'neither disagree or agree'. As presented in the Figure 9. (see Figure 9.) majority (193) of the respondents (262), either somewhat agree (22%) or strongly agree (52%), when the statement was about the degree of domesticity (Finnishness). The milk that majority of the respondents buy, must be produced in Finland. Majority of the respondents neither agree or disagree when asking about eco-certificate and milk that is produced somewhere else in Europe. In case of Heart sign, majority (111 out of 262) neither agree nor disagree with the statement, that the milk they buy, must have it. Figure 9 shows how each of the statements were assessed.

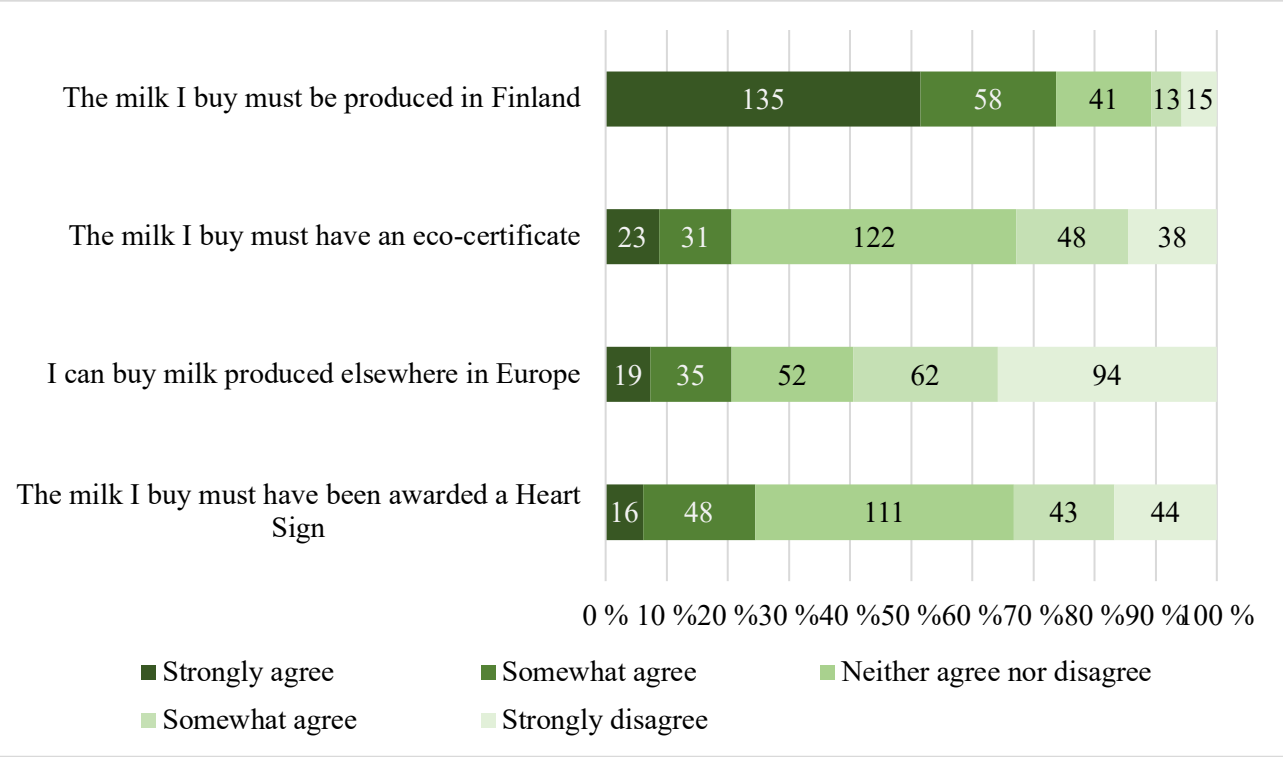

Figure 9. Assessment of the statements regarding milk consumption
Source: Author's calculations based on data from Appendix 5

Of all of the respondents (262) 60% buy both plant-based milk alternatives and cow's milk. Respondents were asked whether they have lactose intolerance or not and out of all respondents (262) only 11% have it. In addition, respondents where asked about their lifestyle and whether they consider themselves as vegan. Only 5% of the respondents said they are vegans.

Questionnaire included a question about diet. Respondents were asked, which diet describes best their own. Of all of the respondents (262) 91% said they eat both animal origin and plant-based products, 7% of the respondents do not eat products of animal origin and the remaining 2% of the respondents eat only products of animal origin.

In section 'milk and plant-based alternatives', questions related to both topics were asked. Respondents were asked do they believe, that regular cow's milks are better choice for their own health than plant-based alternatives. In all age groups, majority (total 181 out of 262) answered 'no'. In addition, respondents were asked do they believe that cow's milk is a more environmentally friendly option than plant-based alternatives. In all age groups, majority (total 203 out of 262) answered 'no'. To conclude, majority of the respondents do not perceive or think cow's milk as a better choice for themselves nor for the environment. Moderate correlation (0,48) can be found between health and environment. Authors own calculations are presented in Appendix 8.

Respondents were asked, that if they were happy with a product from a particular brand, how likely (1 = not likely at all, 5 = very likely) would they buy from the same brand again. Of all respondents (262) 82% would 'very likely' buy again, from the same brand. In addition, respondents were asked, that if they were happy with a particular brand of product, how likely (1 = not likely at all, 5 = very likely) would they try other products from the same brand. Of all respondents (262) 45% would 'very likely' try other product from the same brand.

Respondents were asked to asses (Strongly disagree – Somewhat disagree - Neither disagree nor agree – Somewhat agree - Strongly agree) five statements related to buying behavior and statements were related to buying of both milk and plant-based alternatives. All respondents (262) assessed all statements. From the Figure 10. (see Figure 10) can be seen that majority of the respondents (146 out of 262) do somewhat agree (24%) or strongly agree (33%) with the statement that they buy both plant-based milk alternatives and animal milk (cow's milk). Over 50% (146 out of 262) do strongly disagree with the statement that they would only buy plant-based milk alternatives. Majority of the respondents (199 out of 262) do somewhat agree (45%) or strongly agree (31%) with the statement that they buy products from different brands. Vice versa, majority of the respondents (176 out of 262) do strongly disagree (36%) or somewhat disagree (31%) with

the statement that they would only buy one brand. Figure 10. shows how each of the statements were assessed.

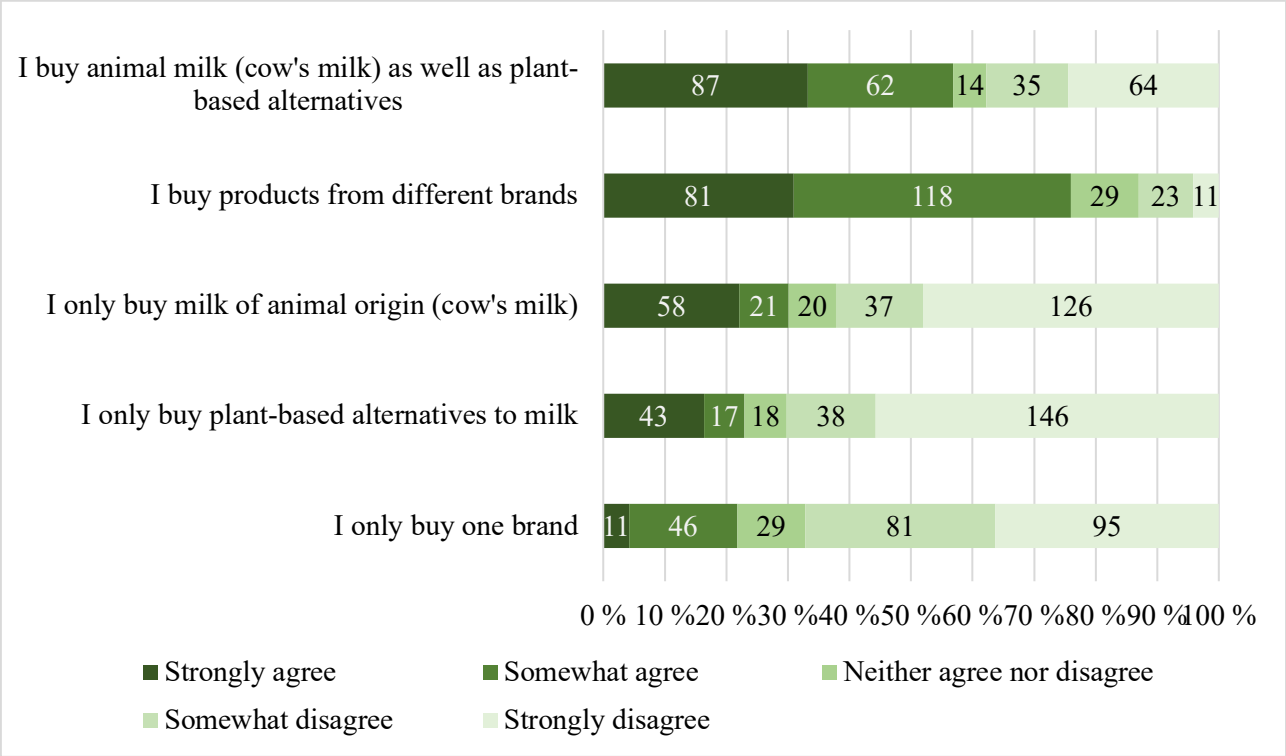

Figure 10. Assessment of the statements regarding consumption and brands
Source: Author's calculations based on data from Appendix 5

In addition, respondents were asked to assess four other statements regarding their consumption. In this question, respondents had to mark on scale 1 to 5 how often (1= never, 5 = very often) they do the thing mentioned in the statement. Statements were related to buying of both milk and plant-based alternatives. All respondents (262) assessed all statements. In Figure 11. is presented how each often each of the five statements were assessed.

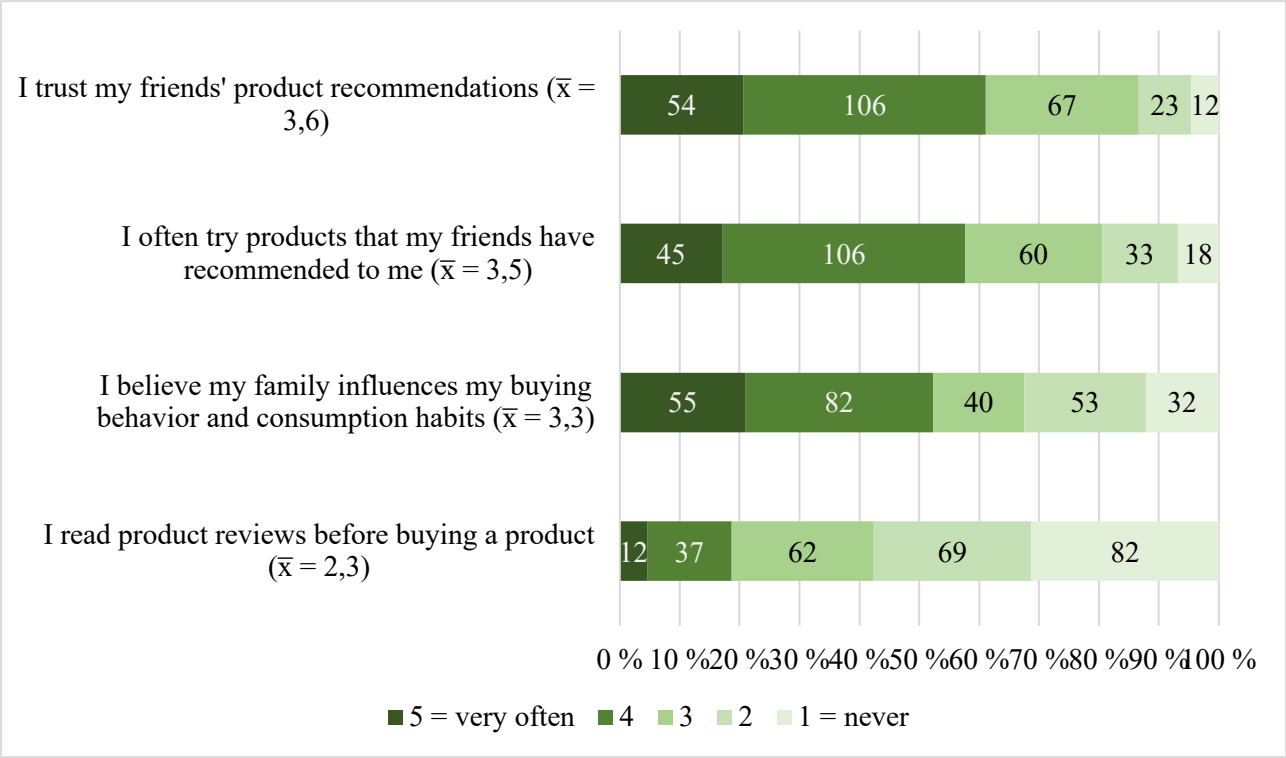

Figure 11. Assessment of the statements regarding consumption and external influence
Source: Author's calculations based on data from Appendix 5

From the Figure 11. (see Figure 11.) can be seen that majority of the respondents (160 out of 262) do trust their friends' recommendations 'often' (40%) or 'very often' (21%). Out of all respondents (262) 61% 'often' or 'very often' try products that their friends have recommended to them. Minority of the respondents (12 out of 262) do 'very often' read product reviews before buying a product. In case of believing own family's influence on buying behavior, results varied a lot.

3.4 Findings, discussion, and suggestions

In this section the author discusses the results which were gained from the online questionnaire and reflects these results to previous studies in addition to the literature overview.

As mentioned in the 'demographics of the respondents' chapter, the online questionnaire had 262 respondents from which 84% were female and 16% male. Respondents were divided in three

different age groups: 18-29, 30-49 and over 50 years old. The average age of the respondents in the questionnaire was 36 years old.

As literature suggests, friends and family can have an influence on individuals buying behaviour and hence be one of the factors affecting purchase decision (Buttle 1986; Drummond, Ensor 2005; Solomon 2019; Armstrong *et al.* 2019). Especially shared experiences and opinions coming from trusted sources (WOM), other than commercial ones, are favoured (Solomon 2019; Armstrong *et al.* 2019).

Results from the online questionnaire support these claims. As seen from the results, majority of the respondents do trust their friends' recommendations when it comes to buying milk and plant-based alternatives. In addition, 'often' or 'very often' milk and plant-based alternatives are tried under friends' influence. Of the respondents 21% believe that their buying behavior and consumption habits are 'very often' influenced by family. In case of plant-based milk alternatives, 53% of the respondents do 'strongly agree' or 'somewhat agree' with the statement that they recommend products to their friends and vice versa (49%). Whether it was related to buying dairy milk or plant-based milk alternative, respondents still valued their personal earlier experince more than recommendations coming from friends and family.

Author made an interesting observation which in part says a lot about the strength of the brand in the dairy business. Out of 115 respondents in 18-29 years old age group, 84 buys some type of milk. As it was seen in the 'demographics of the respondents' chapter, most respondents in this age group were young students, with low estimated annual income and small approximate monthly spending on groceries. Still within this age group, the most bought brand was Valio, with 52%. Valio is the largest player in the industry and offers the widest range of different products but is still the most expensive milk per liter in the groceries stores. This is related to the fact that when asked about the importance of each factor in the purchasing decision, the brand becomes a very important factor for this age group.

As Aschemann-Witzel *et al.* (2020) argues, factors affecting the purchase decision of plant-based products are tastiness, convenience, and simple ingredient list. This is supported by Jalonen (2020) arguing that factors such as taste, health-promoting effects, habits, and interest in new products are factors which affect the purchase decision of plant-based milk alternatives. The results from the questionnaire partly support results from these previous studies. The most important factor

affecting the purchase decision of both dairy milk and plant-based milk alternatives was taste. Over 50% of the respondents 'strongly agree' or 'agree' with the statement that they buy plant-based milks because of the taste. Of all the respondents 44% in total do 'strongly agree' or 'somewhat agree' with the statement that they buy plant-based milks because they want to try new things.

As mentioned previously, Jalonen (2020) argues that dairy products among Finnish consumers are selected because of their price, taste and familiarity. Results from the questionnaire support these claims. Earlier experience as a factor affecting purchase decision was among the five most important factors, taste was the first and price seventh most important factor. As Mäkinen *et al.* (2018) and Sethi *et al.* (2016) argues, in places where cow's milk is not as well available, plant-based alternatives offer an affordable option. In Finland the situation is vice versa; cow's milk is cheaper than any plant-based alternatives per liter.

As study by Niva *et al.* (2018) points out, domestic options of milk are favoured. Results from the questionnaire supports this: degree of domesticity (Finnishness) is the 2nd most important factor affecting the purchase decision of milk. The link between national identity, milk and degree of domesticity (Finnishness) gets support from the results of the questionnaire. Of the respondents 74% do 'strongly agree' or 'somewhat agree' with the statement that the milk they buy, must be produced in Finland. In addition, 60% of the respondents do 'strongly disagree' or 'somewhat' disagree with the statement that they can buy milk which is produced somewhere else in Europe.

In contrast to Pohju (2011), the results from the questionnaire show that 69% of the respondents do not perceive dairy milk as a better choice for their health compared to plant-based alternatives. Results from the questionnaire support results from Jalonen (2020), who argues that in Finland concurrent and versatile use of dairy products and plant-based alternatives occur and plant-based milk alternatives are accepted as an option for dairy products among Finnish consumers. Of the respondents (262) 60% use both dairy milk (cow's milk) and some plant-based alternative.

As Saarnia (2020) and Jalonen (2020) argue, oat is the most known, popular and used plant-based alternative among Finnish consumers. The results from the questionnaire support this claim as the most bought plant-based alternative among respondents was oat (37%).

Results from the study do not support (Pennanen 2018) with the statement that the overall assumption in Finland is that the environmental impact of a plant-based milk alternative is lower than that of cow's milk. Results show that 77% of the respondents do not believe that cow's milk is more environmentally friendly option than plant-based alternatives. This supports (Richie 2020) who claims that there is a growing awareness of carbon footprint, which is affected by both diet and food choices.

For future research author has three suggestions. First, as the results showed, most information of milk and plant-based products come from social media channels and tv-commercials. Hence, it would be beneficial to analyze the used pictures, voices, language and mental-image marketing ways used in these commercials. In addition, analyzing the ways in which these products are marketed to consumers would give more fundamental information to the operators in the market.

Second recommendation would be to conduct the study again but to choose a specific category, such as culture, and include more exclusive questions. This could help to see the cultural influences on buying behavior and purchase decision of consumers in Finland. The interest could be on how big part of food culture milk is in 21st century and how it has been marketed as such for decades.

Third recommendation for the future research would be to investigate the role and power of brands. As seen from the results, brands such as Valio, Oatly, Alpro, Elovena and Oddly Good were very favored among respondents. Retail chains' own brands, which were not among the most bought brands, differ from biggest brands only with their price, not with essential nutritional content, but the taste might be the distinguishing factor. For the future research it could be benefitial to research why these brands are favored among Finnish consumers and what makes them such strong brands.

As suggestions to business companies in the field, author has three suggestions. There is evidence that people are ready to try plant-based milk alternatives and willing to try new things. For business companies it would be beneficial to enter the market with wider range of options. As the results show, degree of domesticity is an important factor for many. At the moment in terms of plant-based milk alternatives, only few of the sold brands offer products of Finnish origin. This offers companies a chance to create and later on promote domestically produced plant-based milk alternatives. In terms of dairy milk, results show that there is no idea to bring a foreign product to the market, when majority favors domestic options.

As mentioned earlier, cheap price is not the reason for buying plant-based milks, taste is. Hence, decreasing the prices might increase the demand and encourage people to try plant-based products in this category. To take into account the demographics of the respondents, majority was from the Southwest-Finland area. This information linked to bought brands, and types of both plant-based milk alternatives and dairy milk shows to supermarket owners and shopkeepers to keep those in the selection.

CONCLUSION

As seen, the complex interplay of cultural, social, personal, and psychological factors affects the consumer's choices. The main research problem of this thesis is the lack of knowledge in terms of the level of importance of certain factors which might affect the purchase decision of Finnish consumers', when buying either dairy milk or plant-based milk alternatives. This thesis aims to find the main factors affecting the purchase decisions of Finnish consumers, when buying milk and plant-based alternatives. It examines both the effects of different factors that might affect the purchasing decision of Finnish consumers and the importance of each factor.

Two research questions are 'What are the most and least important factors that influence Finnish consumer's purchasing decision when buying milk?' and 'What are the most and least important factors that influence Finnish consumer's purchasing decision when buying plant-based milk alternatives?'.

Primary data was collected using quantitative method. Author created an online questionnaire in Google Forms, with 29 questions in total. The questionnaire included four categories: plant-based milk alternatives, milk, both milk and plant-based alternatives and demographics. The questionnaire has 262 respondents in total, both female and male.

To answer the first research question 'What are the most and least important factors that influence Finnish consumer's purchasing decision when buying milk?' results show that the most important factors when buying milk are taste, degree of domesticity and earlier experience. In terms of the factors, the strongest positive linear correlation (0,87) was between friends' and family recommendations. The weakest positive linear correlation (0,03) was between price and brand.

To answer the second research question 'What are the most and least important factors that influence Finnish consumer's purchasing decision when buying plant-based milk alternatives?'

results show that the most important factors are taste and earlier experience. In terms of the factors, the strongest positive linear correlation (0,79) was between friends' and family recommendations. The weakest positive linear correlation (0,07) was between smell and brand. The least important factors for both milk and plant-based alternatives, are food trends, new product to the market and popularity of the product.

When looking at the results from the study, the used sampling method needs to be taken into account. As mentioned before, it has some serious limitations. In this case, convenience sample is not representative of any definable population.

With regards to the questionnaire, author could have inserted questions related to the Covid-19 pandemic and ask whether some factors have become more important than others. This to see if the pandemic has affected the buying behavior and the consumption habits of an individual in categories such as milk and plant-based alternatives.

For the business companies, author has three suggestions based on the study results.

1. New and already existing companies should enter the market with wider rage of options, in trems of both package size and the used plant-base. Ensure the availability of plant-based options.
2. Create and later on promote plant-based milk alternatives which are domestically produced from domestic ingredients.
3. Decreare the price to be more competitive against cheaper dairy milk (cow's milk) and possibly increase demand.

For future research author has three suggestion: (1) Analyse and compare the marketing messages of cow's milk and plant-based alternatives, (2) research the cultural aspect and see how milk and plant-based alternatives are used in 21st century, and (3) investigate the role and power of brands in the industry.

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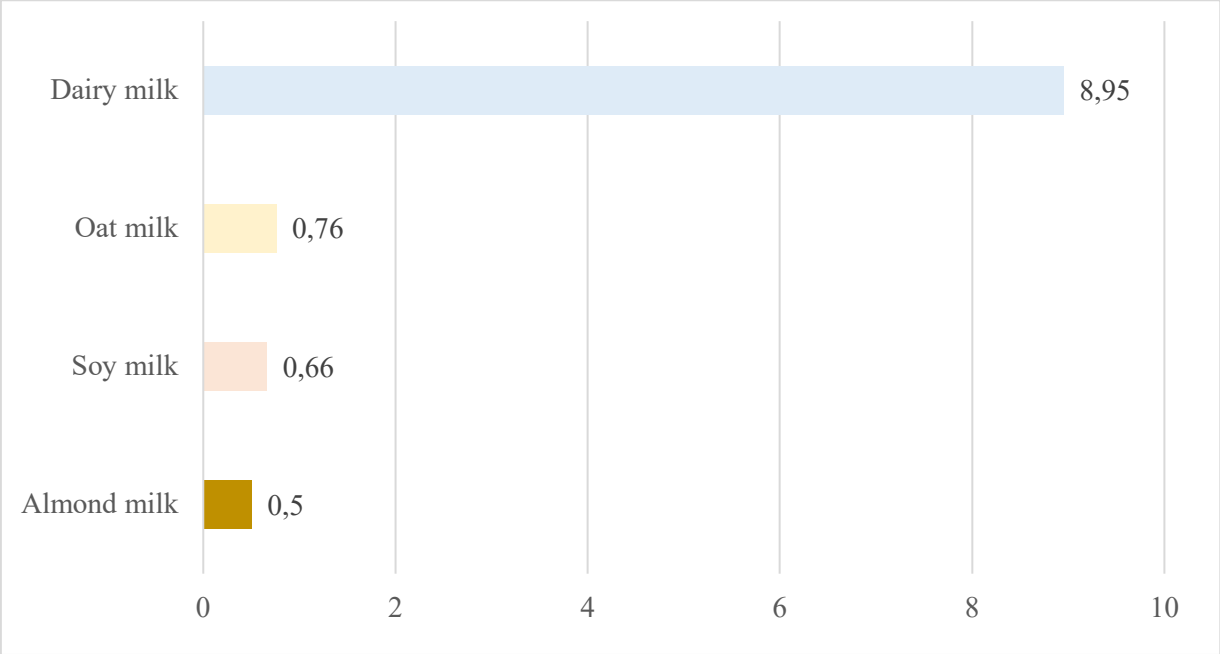
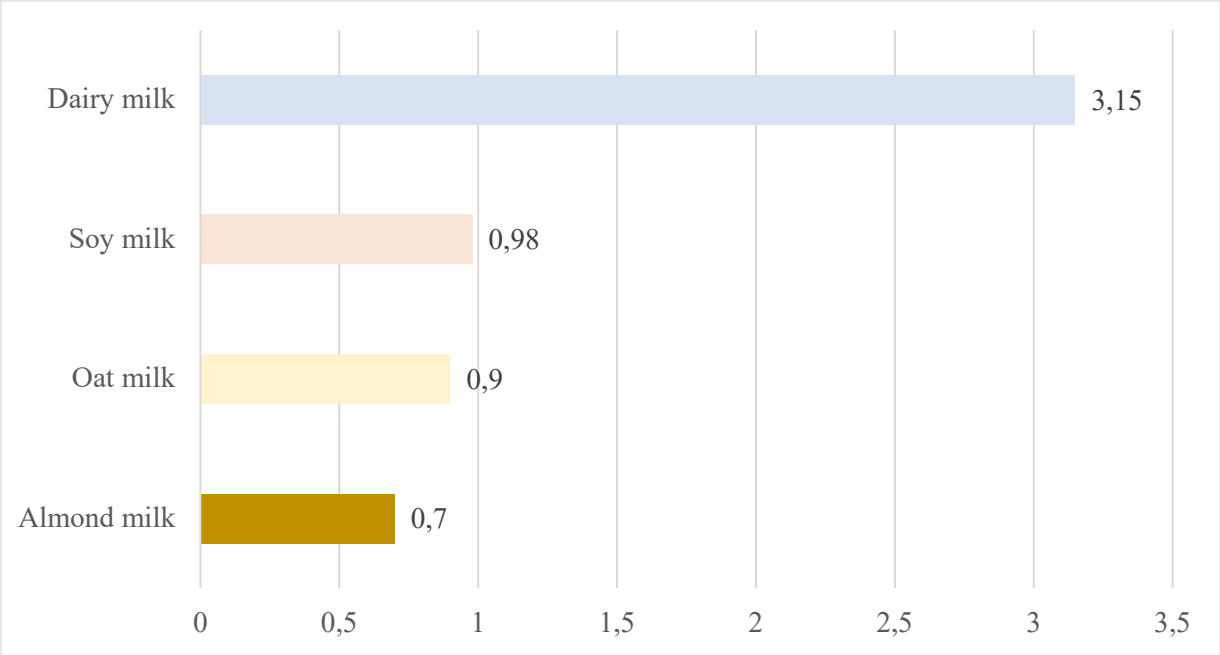
APPENDICES

Appendix 1. Dairy, soy, oat, and almond milk: The use of land in m² per kg



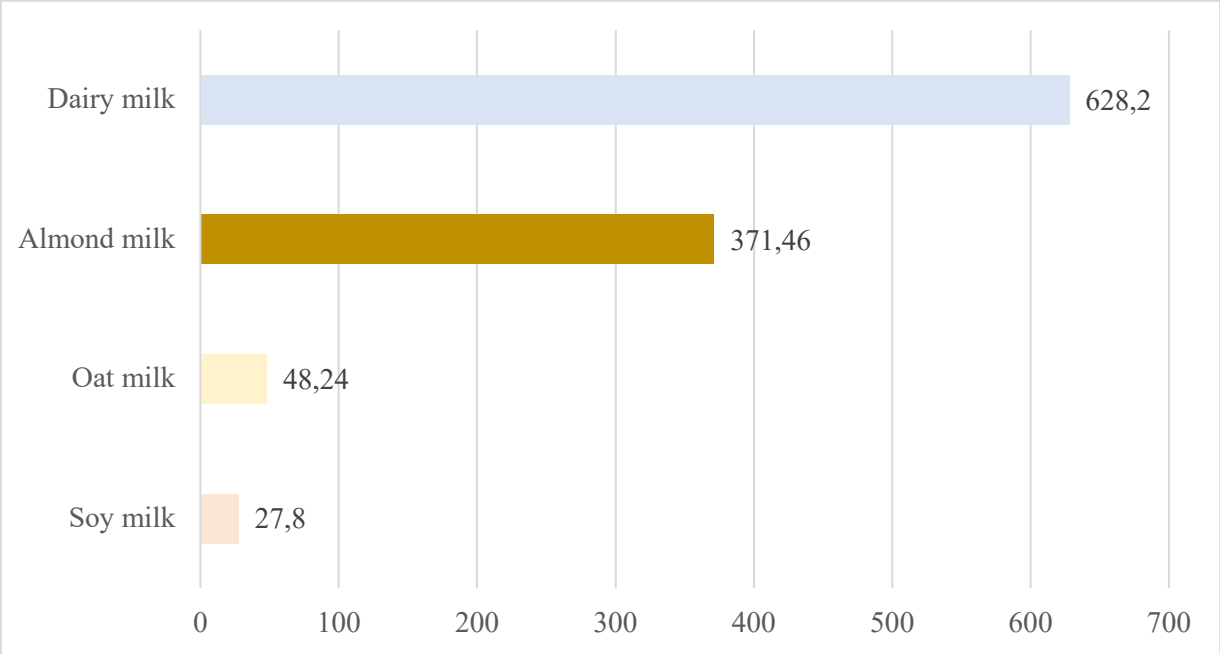
Source: Poore and Nemecek (2018)

Appendix 2. Dairy, soy, oat and almond milk: Freshwater use, litres per litre



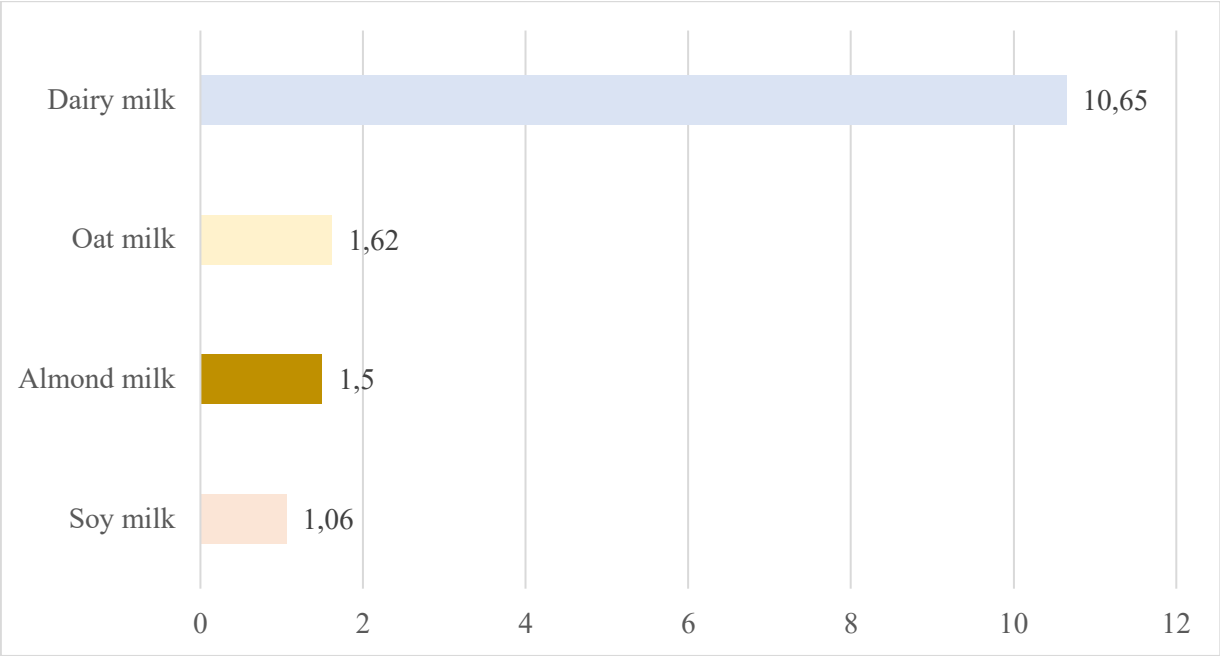
Source: Poore and Nemecek (2018)

Appendix 3. Dairy, soy, oat and almond milk: Greenhouse gas emissions in kgCO2eq per liter



Source: Poore and Nemecek (2018)

Appendix 4. Dairy, soy, oat and almond milk: Eutrophication, kgPO4eq per liter



Source: Poore and Nemecek (2018)

Appendix 5. Online questionnaire and results

Section 1. Plant-based options

Question	Scale items	Result	Scale
Have you purchased plant-based milk alternatives?	A1=Yes	85%	Nominal scale
	A2=No	15%	
If yes, which ones?	A1= Soy milk / beverage	18%	Multiple choice question
	A2= Oat milk / beverage	37%	
	A3= Millet drink	0,3%	
	A4= Cashew milk / drink	4%	
	A5= Almond milk / beverage	18%	
	A6= Rice milk / beverage	6%	
	A7= Coconut milk / beverage	16%	
	A8= Other	0,3%	
	A9= I have not bought plant-based milk alternatives	15%	
Are you vegan?	A1= Yes	5%	Nominal scale
	A2= No	95%	

Factors influencing the purchase decision. On a scale of 1-5, mark how important that factor is to you, when making a purchase decision. (Results shown as an average)	A1= Price	3,4	
	A2= Brand	2,5	
	A3= Labeling	2,6	
	A4= Degree of ecology	2,8	
	A5= Best before date	3,3	
	A6= Environmentally friendly packaging and recycling options	2,9	
	A7=Finnishness; product made in Finland. (Degree of domesticity)	3,1	
	A8=Smell	3,1	
	A9=Taste	4,3	
	A10=Food trends	2,0	
	A11=New product to the market	2,0	
	A12=Promised product features	2,8	
	A13=Product reviews	2,5	
	A14=Nutritional content	2,9	
	A15= Popularity	2,1	
	A16= Availability	3,6	
	A17=Friends' recommendations	3,1	
	A18=Family’s recommendations	3,0	
	A19= Earlier experience	4,0	

Appendix 5 continues

Sentences to assess	Plant-based alternatives to animal milk are foreign to me.	51%	Strongly disagree
		24%	Somewhat disagree
		5%	Neither agree nor disagree
		14%	Somewhat agree
		6%	Strongly agree
	I am ready to try plant-based milks.	5%	Strongly disagree
		5%	Somewhat disagree
		5%	Neither agree nor disagree
		22%	Somewhat agree
		63%	Strongly agree
	I recommend plant-based milks to my friends.	16%	Strongly disagree
		14%	Somewhat disagree
		17%	Neither agree nor disagree
		19%	Somewhat agree
		34%	Strongly agree
	My friends recommend me plant-based milks.	16%	Strongly disagree
		16%	Somewhat disagree
		18%	Neither agree nor disagree
		30%	Somewhat agree
		19%	Strongly agree
	I buy plant-based milks because of their environmental friendliness.	26%	Strongly disagree
		15%	Somewhat disagree
		23%	Neither agree nor disagree
		23%	Somewhat agree
		14%	Strongly agree
	I buy plant-based milks because of their taste.	18%	Strongly disagree
		14%	Somewhat disagree
		17%	Neither agree nor disagree
		26%	Somewhat agree
		26%	Strongly agree
	I buy plant-based milks because of their price.	44%	Strongly disagree
		29%	Somewhat disagree
		20%	Neither agree nor disagree
		6%	Somewhat agree
		1%	Strongly agree

	I buy plant-based milks because I want to try new things.	21%	Strongly disagree
		15%	Somewhat disagree
		21%	Neither agree nor disagree
		32%	Somewhat agree
		11%	Strongly agree
	I buy plant-based options because they are healthier than regular milk.	26%	Strongly disagree
		16%	Somewhat disagree
		28%	Neither agree nor disagree
		17%	Somewhat agree
		13%	Strongly agree
Which of the following brands sold in Finland do you buy the most?	A1= OddlyGood	12%	
	A2= Oatly	41%	
	A3= Elovena	13%	
	A4= Alpro	20%	
	A5= Planti	3,7%	
	A6= Oattis	3,7%	
	A7= Friendly Viking's	1,7%	
	A8= Yosa	4,6%	

Appendix 5 continues

From which sources do you get the most information about plant-based milks? Select all that applies.	A1= TV commercials	14%	
	A2= From the company / companies' website	6,6%	
	A3= From friends	16%	
	A4= Newspapers (paper and / or online)	6%	
	A5= Cooking magazines	8%	
	A6= About the news (network and TV news)	4%	
	A7= From scientific publications	1,9%	
	A8= From books	0,5%	
	A9= From family	5%	
	A10= Instagram	15%	
	A12= Facebook	10%	
	A13= TikTok	4%	
	A14= Some other social media channels	2%	
	A15=On the radio	0,8%	
	A16= Other	2,7%	

Section 2. Milk

Question	Scale items	Results	Scale
What kind of milk do you buy?	A1= I don't buy milk	22%	
	A2= Fat free milk/Skimmed milk (fat percent 0,0 %)	25%	
	A3= First milk (fat percent 1,0%)	2,8%	
	A4= Semi-Skimmed milk (fat percent 1,5-1,8%)	31%	
	A5= Whole milk (fat percent 3,5%)	9%	
	A6= Organic milk	9%	
Factors influencing the purchase decision. On a scale of 1-5, mark how important that factor is to you, when making a purchase decision. (Results shown as an average)	A1= Price	2,8	1 = not important at all 5 = really important
	A2= Brand	2,3	
	A3= Labeling	2,2	
	A4= Degree of ecology	2,3	
	A5= Best before date (3,3)	3,3	
	A6= Environmentally friendly packaging and recycling options	2,5	
	A7=Finnishness; product made in Finland. (Degree of domesticity)	3,4	
	A8=Smell	3,1	
	A9=Taste	3,5	
	A10=Food trends	1,5	

	A11=New product to the market	1,5	
	A12=Promised product features	2,2	
	A13=Product reviews	1,7	
	A14=Nutritional content	2,5	
	A15= Popularity	1,6	
	A16= Availability	3,1	
	A17=Friends' recommendations	1,9	
	A18=Family's recommendations	2,1	
	A19= Earlier experience	3,4	
Which of the following brands sold in Finland do you buy the most?	A1=Pirkka	4,6%	
	A2= Kotimaista	25%	
	A3= Valio	51%	
	A4= Rainbow	4,6%	
	A5= Pohjolan Meijeri	2,8%	
	A6= Arla	4%	
	A7= Juustoportti	8%	
Sentences to assess	The milk I buy must have an eco-certificate.	15%	Strongly disagree
		18%	Somewhat disagree
		47%	Neither agree nor disagree
		12%	Somewhat agree
		9%	Strongly agree
	The milk I buy must have a Heart Mark.	17%	Strongly disagree
		16%	Somewhat disagree
		42%	Neither agree nor disagree
		18%	Somewhat agree
		6%	Strongly agree

	The milk I buy must be produced in Finland.	36%	Strongly disagree
		5%	Somewhat disagree
		16%	Neither agree nor disagree
		22%	Somewhat agree
		52%	Strongly agree
	I can buy milk produced elsewhere in Europe.	6%	Strongly disagree
		24%	Somewhat disagree
		20%	Neither agree nor disagree
		13%	Somewhat agree
		7%	Strongly agree
From which sources do you get the most information about milks? Select all that applies.	A1= TV commercials	19%	
	A2= From the company / companies website	10%	
	A3= From friends	9%	
	A4= Newspapers (paper and / or online)	12%	
	A5= Cooking magazines	12%	
	A6= About the news (network and TV news)	16%	
	A7= From scientific publications	5%	
	A8= From books	1%	
	A9= From family	11%	
	A10= Instagram	0,2%	
	A11= Youtube	0%	
	A12= Facebook	0,2%	
	A13= TikTok	0%	
	A14= Some other social media channel	0%	

	A15=On the radio	0%	
	A16= Other	1,5%	

Section 3. Both milk and its plant-based alternatives

Question	**Scale items**	**Results**	**Scale**
Do you believe that regular dairy products are better for your health than plant-based alternatives?	A1= Yes	31%	Nominal scale
	A2= No	69%	
Do you believe that regular milks are a more environmentally friendly option than plant-based milks?	A1 = Yes	23%	Nominal scale
	A2 = No	77%	
If you are happy with a product from a particular brand, how likely would you buy from the same brand again?	1 - not at all 5 - really likely response on average: 4,8		Likert scale
If you are happy with a particular brand of product, how likely are you to try other products of the same brand?	1 - not at all 5 - really likely response on average: 4,3		Likert scale

Sentences to assess	I buy products from different brands.	4%	Strongly disagree
		9%	Somewhat disagree
		11%	Neither agree nor disagree
		45%	Somewhat agree
		31%	Strongly agree
	I only buy one brand / brand.	36%	Strongly disagree
		31%	Somewhat disagree
		11%	Neither agree nor disagree
		18%	Somewhat agree
		4%	Strongly agree
	I buy animal based milk as well as plant-based options.	24%	Strongly disagree
		13%	Somewhat disagree
		5%	Neither agree nor disagree
		24%	Somewhat agree
		33%	Strongly agree
	I only buy milk of animal origin	48%	Strongly disagree
		14%	Somewhat disagree
		8%	Neither agree nor disagree
		8%	Somewhat agree
		22%	Strongly agree
	I only buy plant-based alternatives to milk.	56%	Strongly disagree
		15%	Somewhat disagree
		7%	Neither agree nor disagree
		6%	Somewhat agree
		16%	Strongly agree

Sentences to assess. (Results shown as an average)	I often try products that my friends have recommended to me.	3,5	Likert scale 1 - Never 5 – Very often
	I trust my friends' product recommendations.	3,6	
	I believe my family influences my buying behavior and consumption.	3,3	
	I read product reviews before buying a product.	2,3	

Section 4. Demographics

Question	**Scale items**		**Scale**
Age	(Result: Average age of the respondents was 36 years old)		Open ended question
Gender Official gender refers to a gender entry entered in the population register, which in Finland can be a woman or a man. Sometimes there is also talk of legal gender (defined by the Finnish Ministry of Social Affairs and Health).	A1= Female	84%	Nominal scale
	A2= Male	16%	

Gender Identity The question is not mandatory, but it gives people the opportunity to express themselves and write about their gender identity, if they do not feel that the legal sex describes them			Open-ended question
Occupational status. In case of being two or more of them at the same time, select the one that best describes you.	A1= Employee (Fulltime employee, Part-time employee, Entrepreneur)	56%	
	A4= Unemployed or laid off	5%	
	A5= Pensioner	5%	
	A6= Student	29%	
	A7= Maternity leave or Paternity leave	4%	
	A8= Other	1,1%	
Estimated annual income or pension	A1= 0-10000€	23%	
	A2= 10001-20000€	18%	
	A3= 20001-30000€	21%	
	A4= 30001-40000€	18%	

	A5= 40001-50000€	10%	
	A6= over 50000€	11%	
Do you have lactose intolerance?	A1= Yes	11%	Nominal scale
	A2= No	89%	
What kind of diet do you have?	A1= I do not eat products of animal origin	7%	
	A2= I only eat products of animal origin	2%	
	A3= I eat both animal and plant-based products	91%	
Estimated spending on groceries (monthly)	A1= 0-100€	4%	
	A2= 101-200€	23%	
	A3= 201-300€	29%	
	A4= 301-400€	23%	
	A5= over 400€	21%	

Visits in grocery store	A1= I don't go to the grocery store.	1%	
	A2= I order my groceries directly to home.	8%	
	A3= I use a pick-up service when shopping for groceries.	3%	
	A4= 1-2 times a week	61%	
	A5= 3-4 times a week	32%	
	A6= More than 4 times a week	5%	
Shops that people visit Choose the three most common stores you visit. If you do not go to the grocery store, but you order groceries with home delivery or use the store's pick-up service, choose the ones whose services you use the most.	A1= K-market	31%	
	A2= K-Citymarket	47%	
	A3= K-Supermarket	34%	
	A4= Prisma	47%	
	A5= S-market	37%	
	A6= Sale	10%	
	A7= Alepa	4%	
	A8= Tokmanni	7%	
	A9= Lidl	39%	

Region where the person is from (inside Finland)	A1= Ahvenanmaa	0%	
	A2= Etelä-Karjala	1,1%	
	A3=Etelä-Pohjanmaa	0,4%	
	A4=Etelä-Savo	0,4%	
	A5=Kainuu	0%	
	A6=Kanta-Häme	1,9%	
	A7=Keski-Pohjanmaa	0%	
	A8=Keski-Suomi	0,8%	
	A9= Kymenlaakso	0%	
	A10=Lappi	0,8%	
	A11=Pirkanmaa	3,8%	
	A12=Pohjanmaa	0,4%	
	A13=Pohjois-Karjala	0,4%	
	A14=Pohjois-Pohjanmaa	1,1%	
	A15=Pohjois-Savo	1,5%	
	A16=Päijät-Häme	2,7%	
	A17=Satakunta	2,3%	
	A18=Uusimaa	12,6%	
	A19= Varsinais-Suomi	69,8%	

Appendix 6. Pearson correlation matrix of the factors related to purchase of plant-based milk alternatives

	B	Pr	L	DOE	BBD	EFPRO	DOO	S	T	EE	FT	PPF	NPTTM	PRe	NC	Po	A	FrR	FaR
Brand (B)	1																		
Price (Pr)	0,16	1																	
Labeling (L)	0,13	0,25	1																
Degree of ecology (DOE)	0,21	0,25	0,67	1															
Best before date (BBD)	0,11	0,36	0,39	0,28	1														
Environmentally friendly packaging and recycling options (EFPRO)	0,18	0,29	0,56	0,76	0,34	1													
Finnishness; degree of domesticity (DOO)	0,17	0,17	0,31	0,39	0,30	0,48	1												
Smell (S)	0,07	0,17	0,32	0,28	0,47	0,31	0,31	1											
Taste (T)	0,28	0,37	0,30	0,39	0,40	0,42	0,32	0,45	1										
Earlier experience (EE)	0,42	0,38	0,21	0,26	0,32	0,27	0,20	0,38	0,62	1									
Food trends (FT)	0,31	0,21	0,22	0,23	0,31	0,17	0,19	0,25	0,25	0,34	1								
Promised product features (PPF)	0,23	0,18	0,41	0,41	0,41	0,44	0,31	0,31	0,37	0,19	0,36	1							
New product to the market (NPTTM)	0,37	0,26	0,28	0,28	0,26	0,24	0,24	0,21	0,30	0,41	0,58	0,35	1						
Product Reviews (PRe)	0,20	0,19	0,30	0,27	0,36	0,23	0,21	0,29	0,39	0,27	0,50	0,44	0,61	1					
Nutritional content (NC)	0,11	0,23	0,52	0,53	0,36	0,45	0,36	0,27	0,40	0,26	0,27	0,45	0,28	0,37	1				
Popularity (Po)	0,50	0,17	0,16	0,16	0,26	0,15	0,10	0,17	0,27	0,35	0,60	0,40	0,62	0,55	0,21	1			
Availability (A)	0,23	0,33	0,36	0,41	0,33	0,39	0,25	0,32	0,51	0,45	0,26	0,43	0,30	0,37	0,32	0,35	1		
Friends' recommendations (FrR)	0,28	0,33	0,24	0,30	0,34	0,21	0,21	0,19	0,42	0,42	0,50	0,36	0,46	0,54	0,30	0,48	0,45	1	
Family recommendations (FaR)	0,17	0,28	0,29	0,28	0,38	0,18	0,24	0,27	0,36	0,32	0,43	0,29	0,39	0,46	0,32	0,40	0,33	0,79	1

Source: Vire (2022), Author's own calculations

Appendix 7. Pearson correlation matrix of the factors related to purchase of dairy milk

	B	Pr	L	DOE	BBD	EFPRO	DOO	S	T	EE	FT	PPF	NPTTM	PRe	NC	Po	A	FrR	FaR
Brand (B)	1																		
Price (Pr)	0,03	1																	
Labeling (L)	0,26	0,33	1																
Degree of ecology (DOE)	0,22	0,19	0,59	1															
Best before date (BBD)	0,20	0,50	0,40	0,31	1														
Environmentally friendly packaging and recycling options (EFPRO)	0,27	0,24	0,51	0,70	0,49	1													
Finnishness; degree of domesticity (DOO)	0,32	0,16	0,36	0,44	0,41	0,46	1												
Smell (S)	0,16	0,22	0,35	0,35	0,43	0,41	0,37	1											
Taste (T)	0,27	0,32	0,41	0,35	0,59	0,40	0,47	0,77	1										
Earlier experience (EE)	0,29	0,41	0,22	0,17	0,49	0,33	0,45	0,50	0,67	1									
Food trends (FT)	0,31	0,26	0,28	0,19	0,14	0,11	0,16	0,15	0,22	0,23	1								
Promised product features (PPF)	0,32	0,29	0,45	0,25	0,33	0,28	0,29	0,42	0,41	0,30	0,50	1							
New product to the market (NPTTM)	0,38	0,26	0,38	0,30	0,16	0,20	0,15	0,24	0,23	0,21	0,72	0,48	1						
Product Reviews (PRe)	0,32	0,29	0,38	0,30	0,21	0,23	0,15	0,36	0,34	0,23	0,63	0,56	0,72	1					
Nutritional content (NC)	0,31	0,25	0,53	0,45	0,40	0,46	0,37	0,50	0,56	0,33	0,33	0,52	0,37	0,51	1				
Popularity (Po)	0,35	0,20	0,31	0,26	0,20	0,25	0,21	0,23	0,28	0,25	0,61	0,51	0,71	0,72	0,46	1			
Availability (A)	0,22	0,42	0,33	0,34	0,55	0,41	0,28	0,53	0,63	0,57	0,17	0,38	0,16	0,32	0,48	0,29	1		
Friends' recommendations (FrR)	0,30	0,25	0,36	0,28	0,28	0,27	0,23	0,35	0,40	0,29	0,51	0,45	0,57	0,65	0,44	0,69	0,41	1	
Family recommendations (FaR)	0,32	0,23	0,36	0,29	0,34	0,34	0,32	0,34	0,38	0,32	0,46	0,43	0,49	0,58	0,45	0,62	0,44	0,87	1

Source: Vire (2022), Author's own calculations

Appendix 8. Correlation between health and environment

	Individual buys plant-based products	Dairy milk is better than plant-based alternative for own health	Dairy milk is better for the environment (more environmentally friendly)
Individual buys plant-based products	1		
Dairy milk is better than plant-based alternative for own health	-0,01896917	1	
Dairy milk is better for the environment (more environmentally friendly)	0,028847199	0,484119818	1

Source: Vire (2022), Author's own calculations

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