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BUYER-READINESS TOWARDS PLANT-BASED ALTERNATIVES TO DAIRY PRODUCTS IN KOLKATA, INDIA

Master's thesis

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The document length is 13777 words from the introduction to the end of the conclusion.

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ABSTRACT

Plant-based milk alternatives have been gaining popularity in recent days. This plant-based alternatives growing popularity increases the need for the product in the Indian market. The specific need for certain Indian consumers is to overcome milk allergies. Plant-based milk alternatives suit specific needs and aim to measure buyer readiness to accept plant-based milk alternatives in Kolkata. The study considers the population to be consuming plant-based alternatives to milk products in Kolkata. The samples have been derived from the population using convenience sampling techniques. The outcome of the study is female dominates the male in buyer readiness stages except for preferences. Despite all the stages, no statistically significant differences were found between males and females. Empirical assessment of sensory, health, environmental and financial aspects are high in females, whereas less in males; however, convenience determinants are high in males, whereas less in females. But the determinants of buyer readiness are not statistically significant. Therefore, it concludes that females are more prone to plant-based foods than male respondents.

Keywords: Buyer readiness, plant-based milk alternatives

INTRODUCTION

Plant-based milk alternatives are gaining popularity in the market. Marketing of these products is increasing owing to changes in lifestyles, consumer interest in taking substitute diets, conscious about expanding viable nutrition and proteins for health. Though cow milk is healthy & nutritious, it affects the environment greatly(Ware 2020). Some environmental affect activities are soil degradation, biodiversity loss and air and water pollution. These environmental pollution activities integrate closely with food and drink consumption. (Rozenberg *et al.* 2016). Due to the integration of environmental pollution, human beings are experiencing milk allergies, lactose intolerant and environmental concerns (Barman 2020). So, human beings are searching for substitute products to tackle allergies.

One such alternative is plant-based milk; it is a healthy, nutritious, sustainable and animal welfare-friendly product. Plant-based milk extracts from legumes, nuts and cereals. Though appearance and taste are closely integrated with traditional cow milk, it is animal-free. Plant-based milk alternatives are rice drink, soy drink, almond drink, rice drink, and more. Out of many drinks, soy has high calcium, and the 10 percent of soy milk is lesser than cow milk (Sousa' Kopf 2017). So, human beings consume plant-based milk products due to dietary lifestyles and health and nutritional benefits (Mäkinen *et al.,* 2016; Derbyshire, 2017; Sousa' Kopf, 2017). Recently, there has been a huge growth for plant-based milk alternatives because of the potential health benefits associated with the products. Some of the benefits are reducing cholesterol levels, increasing cardiovascular health and controlling diabetes. So, these benefits increase the consumption level globally (Market 2021). In the global region, Asia Pacific dominates the largest for plant-based milk alternatives in the market. The Asia Pacific is the world largest single market for plant-based milk products (Plate 2021). The primary reason for dominating the region in the world is due to increment in urbanisation, diversification and free flow of FDI in the food sector. In addition, increment in purchase power, income, demand for healthy products accelerates the plant-based milk alternatives demand in the Asia region. In the Asian region, the Indian market dominates plant-based milk alternatives and the average readiness to consume products is low (Singh 2021).

So, having greater insight into buyer readiness would yield useful information about the Indians level of readiness in the market.

Research problem: There is a lack of studies on measuring the buyer-readiness of a particular city in India. Due to human and industrial activities, the environment is contaminated (Manigrasso *et al.* 2019; Canepari *et al.* 2018). As a result, it damages the food chain & products and creates environmental pollution. Such pollution alters the elemental consumption of milk beverages (Ziarati *et al.* 2018; Rao, Murthy 2017). In addition to altering elemental consumption, toxic elements can also be found in these beverages (Pilarczyk *et al.* 2013; Ziarati *et al.* 2018). As a consequence of toxic elements, milk users have to face health-related issues (allergies, lactose intolerance and dietary restrictions) (Vanga, Raghavan 2018; Sethi *et al.* 2016). These issues may lead the individual to search for an alternative to cow milk. Nowadays, people start thinking that avoiding allergic issues is considered a healthy lifestyle. So, they are searching for the options available in the market. The best option for people is plant-based milk alternatives. The reason behind choosing the product is environmentally friendly, absence of the toxicity of materials, and free from allergic issues (Mäkinen *et al.* 2016; Wade *et al.* 2019; Poore, Nemecek 2018). Plant-based milk alternatives are soy drink, almond drink, rice drink and coconut drink (Ziarati *et al.* 2018; Vanga, Raghavan 2018). These plant-based milk alternative is gaining popularity in the Indian market. An identical problem is highlighted in the GFI report buyer readiness is 21%, and the average consumption is 1.2 litters in a week. The identical way of tackling the problem in quantitative research methods. So, the study measures the gap and makes an effort to investigate the level of buyer readiness of plant-based milk alternatives in Kolkata, India.

The study aims to measure buyer-readiness of plant-based milk alternatives to dairy products in Kolkata, India.

Research question: The below-stated question addresses the issues from a buyer readiness perspective.

1) What is the level of buyer readiness for the plant-based alternative to dairy products?
2) What is the buyer acceptance of a plant-based milk alternative?

Scope of the study: The study focuses on identifying the determinants which induce the consumers to accept plant-based alternatives to dairy products in Kolkata. The study considers the population to be consuming plant-based alternatives to milk products in Kolkata. The samples have been

derived from the population using convenience sampling techniques. Assessing the determinants of plant-based alternatives gives an insight to the marketers in recognizing the stages of consumer belong to.

The hypothesis of the study
1) The level of buyer readiness differs by gender
2) Determinants of buyer readiness differ by gender

This thesis is organized into four divisions. Chapter-1 gives a brief theoretical background of the study. Chapter-2, with research methodology, includes population, samples, sampling techniques, research instruments, data collection analysis, details of hypothesis, and statistical tools to be used in the study. Chapter 3- gives a detailed analysis of data, results, and discussion. The conclusion is drawn in the final chapter.

1. THEORETICAL BACKGROUND OF THE STUDY

In recent days, plant-based milk alternatives have been accepted as functional food for buyers. It considers being a healthy product. Because it has health-promoting compounds like fibres, minerals, and vitamins, all the attributes make the buyers healthy and nutritious. Hence, buyers must pass through various stages to consume plant-based milk alternatives when purchasing a product. Stages of buyer readiness start from awareness of the product to purchase. Past studies focused on evaluating the plant-based milk alternatives with very few aspects of the products. Thus, the researcher wants to measure the readiness stage of plant-based milk alternative buyers. A detailed description of buyer readiness and its theory explains in detail.

1.1. Buyer readiness stage

The state of preparing an individual consumer may be concerning the purchase of the product (Mike 2005; Monash 2021). Munyoki et al. (n.d.) refer to people's awareness and interest in the product. However, Chandrasekar (2010) Buyer readiness classifies the customers based on their willingness and likelihood. As per Sayre Shay (2008), buyer readiness involves six stages. Awareness, knowledge, liking, preference, conviction, and purchase. All the stages are collectively termed buyer readiness state.
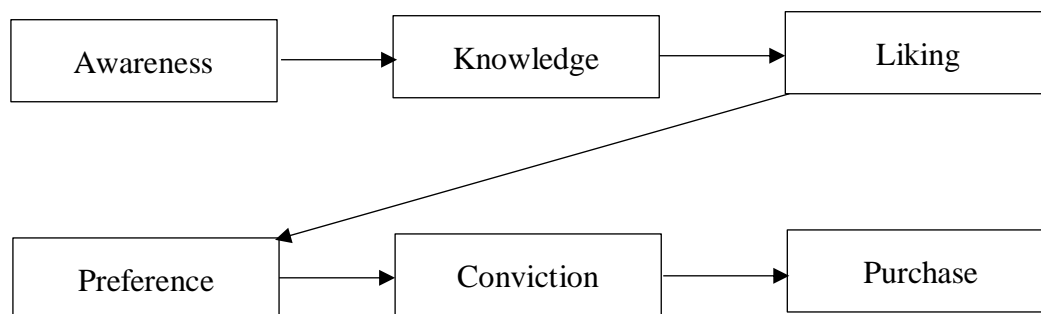

Figure 1. Buyer readiness stages
Source: Author illustration based on Learner (2021)

Awareness: Let buyers know the existence of the products. Awareness is important when plant-based milk alternatives substitute cow milk (Jeske *et al.* 2017). Increased awareness of consumers likely to prefer vegan milk to cow milk (Verduci *et al.* 2019). Nutritional benefits in plant-based foods induce health-conscious consumers to choose the products (Bharti *et al.* 2021). Age, education, and income are important indicators for consumer awareness (Büyükkaragöz *et al.* 2014). Females are aware more of plant-based foods than males. However, higher education level respondents have more awareness than low education level respondents (*ibid*). It is proved in the studies that Indian consumers had a low awareness of plant-based foods than foreign counterparts (Battalwar, Syed 2017; Goel n.d)

Knowledge: Attempt to let the buyers know about the products and their features. Past studies have found that consumers have little knowledge about plant-based foods (Rosenlöw, Hansson 2020; Mohan 2019; Faber *et al.* 2020). One of the studies pointed out that females had a moderate knowledge of plant-based beverages (Battalwar, Syed 2017). However, the other evidence demonstrated that the majority of respondents knew the energy content presented in plant-based beverages (Hughes *et al.* 2021)

Liking: How the market feels about the brand or product. The predictors of plant-based products are appearance, flavour, texture (Sirimuangmoon *et al.* 2016). High sweet taste is a driver for the overall liking of plant-based milk (Rizzo *et al.* 2020). But flavour determines the liking of the products (McCarthy *et al.* 2017; Lumbantobing *et al.* 2020). Overall liking of milk did not differ based on age, gender, income, and frequency of consumption (Pramudya *et al.*, 2019). However, a lower degree of liking was observed in Mäkinen et al. (2015), whereas higher liking acceptance was in another study (Chukwu 2020). Also, males have a higher liking than females (Jacobowitz 2019).

Preference: Dissimilar the brand from competitors in the market. Preferences of plant-based products are based on health, nutritional needs, animal welfare, and ethical and environmental concerns (Rotz *et al.* 2010; Sethi *et al.* 2016; Penha *et al.* 2021). Health and animal welfare are important determinants for vegans to choose plant-based foods (Jabs, Devine 2006). Other determinants were environmental and ethical concerns changing the preference for animal-based to plant-based products (Haas *et al.* 2019; McClements 2020). Females are likely to prefer plant-based products to males (Modlinska *et al.* 2020; Muddeman 2019; Beacom *et al.* 2021). Health and nutritional content present in the products reason for the difference in consumption (Modlinska

et al. 2020; Muddeman 2019). Another study indicates that taste is an important attribute in preferring plant-based products (Prytulska *et al.* 2021).

Conviction: It refers to an actual decision or commitment to purchase. Consumers had a general opinion that it benefits them (Chaiyasut *et al.* 2017). Thus, the benefit significantly increases vegan users (IBOPE 2018).

Purchase: Consumers are motivated either through promotion or incentives; they purchase immediately (Panda 2009). Consumer purchase was heterogeneous among Asians (Cong *et al.* 2020). Young people had a moderate and high purchase intention of plant-based products (Erhard *et al.* 2020). Women consume more plant-based milk than men (Bryant *et al.* 2019; Hoque, Alam 2018).

From the comprehensive assessment of studies, the researcher has found that a few studies assess the buyer readiness of the plant-based product. Consequently, various studies were developed to measure each stage of buyer readiness for plant-based milk alternatives. Thus, the studies give the researcher insight into collectively measuring the buyer readiness stages of plant-based products in India. Later determining the basics of buyer readiness, the subsequent section describes the theory.

1.2. Level of buyer readiness theory

Kotler's well-known theory is the level of buyer readiness stage (Kotler, Armstrong 2010). The buyer readiness stage directs the firm in determining what stages the customer is in now and how to approach them. It starts with awareness, where after knowledge is followed by liking, preference, conviction, and purchase, the six levels of buyer readiness stage.

Awareness is the first stage of buyer readiness, representing how the target audience did not know anything about the company, what the products offer to customers, or had little knowledge about the products that already existed in the market. Most of the target audience had no idea about the products. Hence, such a stage communication message adopts to increase awareness of the target segment by providing valuable information about the products and their benefits.

Knowledge is the second stage in buyer readiness. The target audience is aware of plant-based alternatives to milk products but nothing more. In this stage, the marketer discovers the potential buyers who heard about the products and which consumers know about the products. Also, it helps to find out almost known everything about the plant-based alternative to milk products. The promotion message informs about the quality and benefits of the plant-based alternative to milk products to reach the target group.

Liking is the third stage of buyer readiness. In this stage, all communication message decisions rely on how the target group answers questions regarding awareness of plant-based products. If potential consumers are well aware of plant-based products, the marketer must create a postie relation. If marketers find the incredulous of plant-based products, they have to figure out the reasons for changes in attitudes and focus more on changing the aspects.

Preference is the fourth stage of buyer readiness. In such a stage, target audience like plant-based products did not mean that it gave an advantage over competitors. In this case, the communication message aims to form a preference among customers, pinpoint the qualities, benefits, and value of products that plant-based products offer to customers.

Conviction is the fifth level of the buyer readiness stage. In this stage, the target audience's preference is on offering plant-based products of competitors, and they are not sure about buying and cooperating with plant-based products. With the help of promotional messages, manufacturers create confidence among potential buyers.

Purchase is the last stage of buyer readiness. In this stage, the target audience has to choose the right products for the customers (Talasenko 2014).

1.3. Determinants of buyer acceptance of plant-based alternatives

As per the new nutrition business (2020), plant-based foods are among the top three global food trends (Business 2020). The primary reason for emerging as a top trend can reduce obesity, body fat body weight (total body mass and fat mass) (American Dietetic Association 2013; Cummings *et al.* 2012; Berkow, Barnard 2006). Also, it reduces cardiovascular diseases and gives good

Nutritional status to the individual (Friedewald *et al.* 2011; Szabó *et al.* 2016; Benzie, Wachtel-Galor 2009; Vanga, Raghavan 2018). Despite these benefits, the consumption of plant-based alternatives is low (Miki *et al.* 2020). In contrast, the Government of India states that the country has the largest veganism globally, which accounts for 30% of the country population (1.38 billion) (Patil, Sandoval 2021). As per previous studies, the Food choice of vegan buyers in India is based on aspects like health (Lê *et al.* 2013; Steptoe *et al.* 1995; Eertmans *et al.* 2005), wellbeing and contentment, ethics & environmental (Pieniak *et al.* 2009; Konttinen *et al.* 2013) and financial aspects (Chalupa-Krebzdak *et al.* 2018; Jeske *et al.* 2017; Corrin, Papadopoulos 2017; McCarthy *et al.* 2017). Thus, the important determinants of buyers have been taken into account.

Health: An individual's food choice depends upon health and taste (Allès *et al.* 2017). Nowadays, individuals transform from animal-based products to plant-based milk alternatives not only for the population health but also to safeguard their health (Steenson, Buttriss 2021; Cramer *et al.* 2017; Culliford, Bradbury 2020). Globally, demand for plant-based products significantly protects the environment and health (Nguyen, Nguyen 2021). Plant-based food replaces animal products for offering health and environmental benefits to human beings (Tilman, Clark 2014; Pradhan *et al.* 2013). Individuals start perceiving that plant-based alternatives are beneficial to health and the environment (Lea *et al.* 2006; Reipurth *et al.* 2019; Vanhonacker *et al.* 2013). Health is a significant component of sustainability (Mertens *et al.* 2017). Plant-based foods promote healthy life, low environmental impact for present and future generations (Alsaffar 2016). Preferences for plant-based alternatives is owing to health and animal welfare (Jabs, Devine 2006). Individuals can enjoy healthy eating through plant-based foods that cure illness and promote wellbeing, nutrition, and health (Fehér *et al.* 2020; Tuso *et al.* 2013). It reduces the risk factors leading to the development of diseases (Weinrich 2019). Plant-based milk alternatives have a high anti-oxidant content which acts as preventative agents against cancer (Rawal *et al.* 2015). Even though plant-based milk alternatives are beneficial to human beings, inconvenient, expensive, and not enjoyable are the key aspects preventing buyers from consuming products (Bryant 2019). Previous studies pointed out that females of higher income tend to choose plant-based milk alternatives than males (Kiefer *et al.* 2015; Haas *et al.* 2019; Alae-Carew *et al.* 2021; Nguyen *et al.* 2020). From the studies, it is clear that a small number of literature studies measure the differences of gender in health aspects. Therefore, the researcher measures the attributes in the present study.

Environment benefits: Consuming modern western items created environmental impact in water deprivation, land use, erosion resistance, groundwater replenishment, biodiversity, mechanical filtration, and biotic production (Perignon *et al.* 2019; Springmann *et al.* 2018). Climate change is one of the adverse effects of milk production, creating acidification and eutrophication (Noya *et al.* 2018). To reduce the environmental impact made out of the western diet, people give more concern to plant-based foods. The key drivers of consumers' shift from animal to plant-based milk are health, animal welfare, and environmental concerns (Banovic *et al.* 2018; Peschel *et al.* 2019; Aschemann-Witzel *et al.* 2019; McCarthy *et al.* 2017). Also, they focus more on increasing food sustainability, reducing environmental impact (Willett *et al.* 2019). However, lifestyle changes determine the food preferences of consumers (McCarthy *et al.* 2017). Consumers concerned with the environment consume plant-based milk alternatives more frequently (Boaitey, Minegishi 2020).

Röös *et al.* (2018) compared traditional dairy farm production techniques with an oat milk substitute. Results of the study indicated that oat-based milk alternatives diminish the environmental impact to 10-20%. The solution to the environmental problem is due to a lower amount of greenhouse gas emissions. Aydar *et al.* (2016), Çatalkaya and Kahveci (2016), ÖZÇELİK *et al.* (2016), and Tekin *et al.* (2016) represented in their studies that plant-based milk waste contains bioactive compounds, anti-oxidants, surface-active agents, dietary fibre, and colourant. Recycling plant-based milk waste reduces the environmental problem. Plant-based milk alternatives decrease water usage, reduce climate change, and increase ecotoxicity (Naranjo *et al.* 2020; Röös *et al.* 2016). Some of the studies highlight that plant-based products can control the exploitation of economic resources. (Weinrich 2019; Candy *et al.* 2019; Fehér *et al.* 2020). Also, it reduces global warming and environmental pollution (Mylan 2018; Candy *et al.* 2019; Schenk *et al.* 2018; Leitzmann 2014). Previous studies highlighted that female is more likely environmentally friendly than males (Hartmann, Siegrist 2017; Valgemäe n.d). Thus, the differences in environmental benefits exist between males and females but are addressed in a small number of studies. Therefore, the present study addresses the differences in a wide way.

Ethical benefits: Since from 19th century, concerns of animal welfare traced out in dairy production (Fisher 2019). In the 20th and 21st centuries, dairy production was criticized for animal abuse, and hence campaigns conducted that negatively affected dairy production (Mylan *et al.* 2019). Thus, it changes the preferences on the use of products based on animal origin (Balieva *et al.* n.d). Nowadays, consumers are more prone to buy animal-friendly products (*ibid*). Some recent studies

state that consumers are more concerned about animal welfare (Clay *et al.* 2020). Animal welfare is the first and foremost argument for dietary choices. Janssen *et al.* (2016) pointed out that vegan consumer groups give more importance to animal origin products where animal welfare is the primary attribute. Recently, many studies reported that animal welfare is the primary reason for following plant-based milk alternatives (Janssen *et al.* 2016; Leitzmann 2010; Radnitz *et al.* 2015; Fox, Ward 2008; Kerschke-Risch 2015). However, some studies gave less preference to animal welfare (Lea *et al.* 2006; Lea *et al.* 2006). One of the studies stated that females were concerned about animal welfare than males (Beardsworth *et al.* 2020; Michel *et al.* 2021). Therefore, the study insisted the researcher measure the differences in animal welfare between males and females.

Comfort and contentment: People are experiencing a good state of improvement in their health condition. Thus, the outcome induces the individual to transform from a normal to a plant-based diet (Fehér *et al.,* 2020). Nowadays, individuals need products that should not create health risks; rather, they should improve their wellbeing. Thus, the feeling increases contentment with the particular product. Comfort and contentment are strongly associated with the amount spent on physical activity and recreation. Subsequently, plant-based products had a positive association with wellbeing, and they induce the achievement of peace and contentment (Kökény 2005; Lea, Worsley 2002; Lea *et al.* 2006). A recent study by Judge and Wilson (2015) discusses that consuming plant-based products increases social dysfunction. Individuals following plant-based products can spend less time on health and health care, increasing their quality of life (Meyer *et al.* 2006; Kökény 2009).

To sum up the aspects, it has been demonstrated that all the determinants play a key role in influencing buyer acceptance. Hence, the aspects have been taken into account.

1.4. Plant-based alternatives to dairy products

Plant-based milk alternatives are water-soluble extracts from cereals, pseudo, legumes, nuts, seeds. These soluble extracts closely resembled bovine milk. Plant extracts break into small sizes of raw material and are then extracted in water, subsequently homogenized. The extract is the best substitute for cow milk (Mäkinen *et al.* 2015; Sethi *et al.* 2016; Lima *et al.* 2017). Plant extract beverages exhibits include an absence of cholesterol, lactose, low saturated fat, high unsaturated fat, and at the same time, it has fibre and isoflavones (Singhal *et al.* 2017; Cornucopia Institute

2019; Röös *et al.* 2018). However, milk can cause allergies to users, and it has a low micronutrient content, protein and antinutrient (Singhal *et al.* 2017; Mäkinen *et al.* 2016). All the cons make the milk be lower acceptance among the consumers (Oduro 2018). Although plant-based milk alternatives have different nutritional values (Silva *et al.* 2020), it is classified according to the raw materials (Mridula, Sharma 2015; Gobbi *et al.* 2019; Sethi *et al.* 2016)

1) Cereal-based alternatives: oat drink, rice drink, corn drink, spilt drink.
2) Legume-based alternatives: soy drink, peanut drink, cowpea drink.
3) Nut-based alternatives: almond drink, coconut drink, hazelnut drink, pistachio drink, walnut drink.
4) Seed-based alternatives: sesame drink, flax drink, hemp drink, sunflower drink.
5) Pseudo-cereal based alternatives: quinoa drink, teff drink, amaranth drink

There are myriad different milk alternatives available on the market. However, the author detailed the following plant-based milk alternatives: almond drink, oat drink, rice drink, and soy drink.

Almond drink is a plant-based milk alternative produced by almonds and water (Dhakal *et al.* 2014). Almond drinks can only make from filtering water and almonds, a blend of vitamins and minerals, salt, and food additives. This drink added sweetness and flavours to enhance the taste (Torna *et al.* 2020). The nature of the drink is a sweety nutty flavour (Sethi *et al.* 2016). The drink is fortified with calcium, Vitamin A and D. Also, it contains several vitamin E contents 6.33 mg 100 g^{-1} (National Institutes of Health 2018; USDA 2018). It produced the highest IgE immune response to users (Vojdani *et al.* 2018). It also helps people to control blood lipid, reduce heart diseases and serum cholesterol levels (Karimidastjerd, Konuskan n.d). It also keeps people healthy and prevents anaemia and free radicals (Sethi *et al.* 2016; Silva *et al.* 2020). Thus, the benefits make the drink be popularly consumed globally (Cornucopia Institute 2019). Also, it is suitable for Lacto intolerant people, pregnant women, and vegan adults (Wansutha *et al.* 2018; Torna *et al.* 2020). Apart from the benefits, the milk did not have saturated fats and is not suitable for dietary fibre.

Cereal grain oats produce oat drinks. Available oat drink is made from water and oat flour. But the brands come up with variations by adding ingredients like vegetable oil, salt, stabilizers and a few more additives. This drink is slightly brownish due to natural pigments (McClements *et al.* 2019). Oat drink has a higher energy density, less saturated fat than cow milk (USDA 2015; Reyes-Jurado

et al. 2021). Other nutrients present in the drink are carbohydrates, protein, fibre content (USDA 2015; USDA 2020). Some drink is fortified from calcium, vitamin A, B12, D and riboflavin (Cooper *et al.* 2020). Low calcium content in drinks supports to be a significant mineral for human growth (Demi *et al.* 2021). Phytic acid in the drink reduces zinc and iron absorption (Aydar *et al.* 2020). This drink is suited for Lactose intolerant, vegan, gluten intolerant, and celiac disease (Cooper *et al.* 2020). Therefore, the benefits acquired from the drink makes it recently hit the grocery shelves as a substitute for dairy milk (*ibid*).

Rice drink is a plant-based milk alternative produced by milled rice and water. Rice drink is also a non-dairy beverage (Lamothe *et al.* 2020). Because the drink is supplemented by some of the flavour enhancers (vanilla and whole-grain rice syrup) (Tzifi *et al.* 2014), it has a drink and is sweet (Jaekel *et al.* 2010). Rice drink contains many carbohydrates, calories, and sugar content (McClements *et al.* 2019). But it contained a smaller proportion of protein, vitamins, lipids, and minerals. The main ingredient of rice drinks is fortified with iron and calcium (Paul *et al.* 2020; Sethi *et al.* 2016). It is free from saturated fat and cholesterol (Singhal *et al.* 2017). Thus, the drink suits vegan and lactose-intolerant adults, but it should not feed infants (Lamothe *et al.* 2020).

Soy drink is a plant-based milk alternative produced by soybeans (Goldberg *et al.* 2021). Soy drink contains a large amount of protein, unsaturated fatty acid, iron, niacin. Also, the drink has lower fat, calcium, and carbohydrates. But at the same time, the drink contained a higher concentration of strong anti-oxidants but did not have lactose content and cholesterol (Karimidastjerd, Konuskan n.d; Mazumder, Begum 2016). Many nutritional compounds in the drink increase digestibility at a low cost (Sethi *et al.,* 2016). Also, the drink contains a lower calorie content (McClements *et al.,* 2019). Still, at the same time, it had a higher dietary fibre, total unsaturated fatty acid, and protein content of 8.71% (Vanga, Raghavan 2018). Soy drink is the best drink (*ibid*), but the liking is lower (Kundu *et al.* 2018). The natural pigment of the drink is a beany flavour, and thus it has less in demand in the market (Vanga, Raghavan 2018; Sethi *et al.* 2016).

Later determining the basic categories of plant-based milk alternatives, the subsequent section presents the market situation in detail.

1.5. Plant-based milk alternatives market

The plant-based milk alternatives market has increased significantly in recent years. Global sales of plant-based milk alternatives increase from 21 billion USD to 1.6 billion USD in the first half of 2018 (Cornucopia Institute 2019. Watson 2018). The global market for plant-based milk alternative market was valued at 17 billion USD in 2018 and is projected to grow 12.1 billion USD by 2024 (Research and Markets 2019). The most common plant-based drink alternatives are soy drink, coconut drink, and almond drink. Some new flavours are available in the market (hazelnut, flaxseed, and pecan) (Silva *et al.* 2020). Among various plant-based extracts, the global market is dominated by rice, oat, coconut, and almond milk. It increases the largest portion of the market share to 51.5%. Total anticipated consumption of rice, almond, seeds drink increased from 10.5 million litres to 30.1 million litres by 2022 (Pak 2019). However, soybean drink dominated the market to 90% market in 2018.

Further, in 2020, soybean and almond drinks will dominate the largest market share. It is quite popular among people because of its increasing popularity, fitness enthusiasts, and admiration increase the global demand for products. It is anticipated that other beverages may increase in the subsequent years (Business Wire 2020).

Factors driving plant-based milk products in the global market: Nowadays, customers search for lactose-free, dairy-free, and plant-based options for healthy lifestyle choices (Bizzozero 2017). Apart from the above factors, some other factors like beverage industry expansion, the popularity of products among people, increment in the diabetic population, rapid urbanization and increment in disposable income increases the market for plant-based milk alternatives considerably (Research Markets 2020).

Region analysis of plant-based milk: The market for plant-based milk alternatives is growing rapidly. Asia Pacific countries like China, India, Indonesia, and others are highly engaged in producing soy, coconuts, and rice. Thus, it directs to hold the highest value of a market share, which accounts for above 50% in 2019 (Persistence Market research, n.d; Global Markets Insights, 2020). The primary reasons for rapid growth in the Asia Pacific market are the increased middle-class population, consumer awareness about health and fitness, increment in income and purchasing power, and consumer demand for nutrition and health products. Moreover, Europe is

exhibiting a significant value of a market share in the global market. Middle East Africa and Latin America anticipate exhibiting substantial growth in the global market in subsequent years.

Asia Pacific market: The Asia Pacific is the largest market for dairy alternatives. This is primarily due to getting relief from various issues like bloating, skin issues, and so on (Mordor Intelligence, n.d.). Recently, consuming plant-based milk alternatives increased significantly due to increment in vegans and health issues regarding antibiotics and growth hormones found in cow's milk. The primary vital drivers which accelerate Asia pacific market is that lactose intolerance and milk allergy. Allergies, veganism, paleo diet, general health, well-being, and changing consumer perceptions increase the demand for dairy alternatives in the Asia Pacific market.
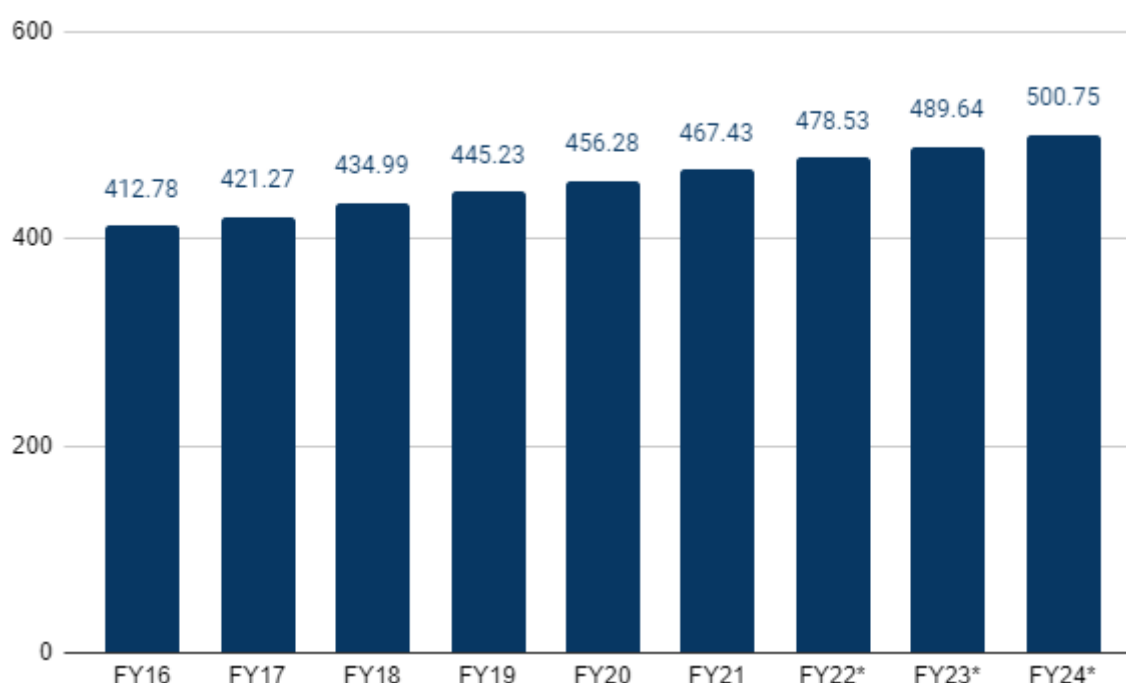
Figure 2. Financial Years (FY) of Asia Pacific market
Source: Author's Illustration

Out of many Asia Pacific countries, India holds a significant market share for dairy alternatives. As per Market analyst's Business Wire, the Indian dairy alternative market has 2,35,238.11 Euro in 2018 and anticipates growing 719220.82 Euro in 2024.

The future market of plant-based alternatives dairy products will be increased dramatically like more the two times will reach 63.9. North India holds 40% of the share, East India 10%, South

India 20%, and West India have 30% in the total Indian dairy alternative market (Mohanty 2020). The North Indian market and West Indian market hold 40 and 30 percent that is very significant compared to South India and East India. South India has a middle market for plant-based milk alternatives. Therefore, the researcher is keen on measuring buyer readiness towards plant-based milk alternatives in the South Indian market.

1.6. Buyer acceptance of plant-based milk alternative

Buyer acceptance of plant-based milk alternatives is based on the product and consumer characteristics (Cichońska, Ziarno 2020). Features of products include price, taste, convenience, appearance, and health-promoting attributes. Consumer characteristics represent the approach to innovation, preference of products relates to a specific group, and nutritional content of the product greatly determines the acceptance of products. However, experiencing new plant-based milk alternatives is based on taste, nutritional content, health benefits, and environmental aspects. These aspects determine the willingness to try new food in the market (Makinen *et al.,* 2016). Taste is the only determinant for consumer acceptability (Schyver, Smith 2005). Buyer acceptance is significantly increasing owing to the sensory and quality of plant-based milk alternatives (Aydar *et al.* 2020). However, before consuming the products, product shape, appearance, and colour determine the consumer acceptance (Johanna *et al.,* 2011). Flavour and texture play a lesser role in consumer acceptance (Fiorentini *et al.* 2020). Colour, brightness, intensity, and sweetness were important to determine the acceptance of products (Villegas *et al.* 2009). Nutritional value, aroma, taste and texture, microbial safety, and stability (Paz *et al.* 2020). Consumer acceptability relies on taste, cost, and convenience. These attributes determine the success of the product (McClements *et al.* 2019). A recent study shows that extrinsic attributes and personal values affect purchasing plant-based milk products (McCarthy *et al.* 2017). Extrinsic attributes like fat content, package size, and label claim to impact the consumption of products. Also, fat content, gallon or half-gallon packaging, pasteurized store brands affect consumers to consume the products. However, plant-based sources, sugar content, and packaging size are significant determinants of consumer acceptability (Aydar *et al.* 2020).

Vegan lifestyle, flexitarian is the primary reason for accepting plant-based products (Mäkinen *et al.* 2016; Derbyshire 2017; Janssen *et al.* 2016). Apart from lifestyle, ethical, social, economic, and environmental aspects are the drivers of consumers to accept plant-based milk (Hamilton

2006). In addition, local origin, tradition, and local economy determine products' acceptance (Haas *et al.* 2013; Cerjak *et al.* 2014). From the assessment of past studies, the study gives importance to product features and how it induces the consumers to accept their plant-based milk alternatives in India.

1.7. Research gap

üyükkaragöz *et al.* (2014) and Battalwar and Syed (2017) discussed the Indian consumer awareness of plant-based foods. In addition to these, (Battalwar, Syed 2017; Rosenlöw, Hansson 2020; Mohan 2019; Faber *et al.* 2020; Hughes *et al.* 2021) elaborated the detailed level of knowledge of Indian consumers on plant-based foods and beverages. In addition, recent articles have demonstrated consumers' liking of plant-based beverages (Pramudya *et al.,* 2019; Jacobowitz 2019; Chukwu 2020).

The above studies indicate the increased prevalence of studies on awareness, knowledge and liking of plant-based foods and beverages. Little research is available on plant-based milk alternatives in the Indian market. Moreover, there is a lack of studies on measuring all the aspects in the same study. The researcher identified the gap and preceded to execute the study widely.

Previous research on consumer preferences was done for plant-based products (Modlinska *et al.* 2020; Muddeman 2019; Prytulska *et al.* 2021). As per the earlier work by Bryant *et al.* 2019; Hoque, Alam 2018, the researcher can recognise the purchase intention of plant-based food consumers. Lack of studies identifies the Indian consumer preference, conviction, and purchase intention of plant-based products.

One of the recent studies by Rai *et al.* (n.d) views plant-based milk and curd acceptability among India's intolerant people. Their focuses more on taste, appearance, colour, and texture. But the author did not focus on buyer readiness for plant-based milk products in Kolkata. As a result, the study identifies the gap and is keen on measuring buyer readiness greatly.

2.   RESEARCH METHODOLOGY

The chapter follows a specific research design that ultimately exhibits how to carry out the entire research process. It also makes a decision on which methods wants to choose in influencing the academic study significantly. It also describes the respondents who were taken up for the study, how to derive the samples, apply sampling techniques, determine sample size, the instrument used to construct a questionnaire and data collection. It also explains the procedures followed in carrying out the study effectively. Also, it gives in-detail information on the application of statistical tools for the gathered data. At last, ethical issues followed in the process are also discussed.

Research Design

Research design is a crucial road map that will offer the researcher a position and exhibit where they stand once they complete the research. One of the simplest ways to set up a research design is descriptive research. Descriptive research exhibits the existing phenomena as accurately as possible. In descriptive research design, the phenomena are readily available. The researcher collects the information through the research instrument, i.e., questionnaire. So, quantitative methods attempt to know the buyer readiness level of plant-based milk alternatives. Similar approaches have been used previously (Verduci *et al*. 2019).

Sample

The present study considers the population to be consuming plant-based alternatives to milk products in Kolkata.

Samples: Samples are a relatively small number of plant-based milk alternative consumers in Kolkata. Samples in rural, urban, and semi-urban areas of Kolkata have been considered. Samples are determined based on Rai et al. (n.d) reported. These samples are determined based on non-probability sampling. Among the various non-probability sampling techniques, convenience sampling techniques have been adopted for the study. An advantage of the convenience sampling

technique is that it is easily accessible & available at a given time. The main difficulty with this approach is the problem of bias, and the sampling should not be taken to represent buyers. This study sample size is 110 plant-based milk alternative consumers.

Data collection

Data collection gathers the respondent's opinion, measures the variables using statistical tools, fixes the hypothesis, and derives the outcome (Kabir 2016). The study has adopted quantitative data collection methods, which are cheaper for the research. Also, the sources of data collection are made through primary data. The researcher has collected for the first time through primary data, and the information derived out is highly reliable and authentic. All the respondents' opinions have been gathered through a questionnaire that includes open-ended questions followed by multiple-choice and Likert scale questions. The questionnaire is the best means of collecting primary quantitative data. It enables quantitative data to be collected in a standardized way. Also, data are consistent and coherent for analysis (Roopa and Rani 2012). The researcher had acquired the questions of awareness and knowledge (Grasso et al., 2019), conviction (Hoffman *et al.,* 2013), liking (Awasthy *et al.,* 2012), preference (Reineke 2020), determinants of buyer readiness of plant-based alternatives to milk products. The researcher prepared all the questions in google form; sent the link to the respective persons. The study has also gotten assistance from a local consultancy in Kolkata and provides plant-based alternative milk users' mail IDs. After getting contact details from respective persons, the researcher communicated with the respondents through respective mail IDs. Consequently, the researcher sent the google form link to the respondents via social media and different groups. The researcher has received 110 opinions, which have been taken into account.

Reliability is used to measure the instruments to check whether it gives similar results when applied to various times (Sürücü, Maşlakçı 2020). It can be measured through Cronbach's alpha. Cronbach alpha is a widely used method to test the internal consistency of the constructs. The present study has considered fifty-three Likert scale questions (excludes respondents' profile), which paves the way to get a value of 0.985. Therefore, the results indicate that the internal consistency of the scale is high.

Data Analysis

The statistical analysis depends on the objective of the study (Talasenko 2014). The fundamental goal of applying statistical analysis is to offer information about the population study situation.

The first statistical task is percentage analysis for multiple-choice questions. In this analysis, the researcher presents the different categories and their obtained percentages in tables and graphs. The main intention is to offer precise information to the reader. The second task is to do a descriptive analysis for the variables, including dependent (purchase) and independent variables (awareness, knowledge, liking, preference, and conviction). The main objective of using descriptive analysis is to determine the variables' average values and know-how the constructs vary within the sample. The third task is to apply an independent sample t-test to compare males' and females' mean on the level of buyer readiness on plant-based alternatives to milk products and the benefits derived from the products. Last, the study gives detailed explanation on factor analysis. Consequently, the researcher has implemented the tools using the SPSS software package. A fuller exhibition of the results is presented in the next section.

Ethical Considerations

All moral issues were continued to complete the examination. In an exploration project, it is basic to stick to moral contemplations. Before leading the meeting and study, respondents gave composed assent. Moreover, members were not controlled in any way. Uncaring inquiries were not posed of the members.

Moreover, the review's members' secrecy has been completely safeguarded. Respondents were given a choice to leave the overview or meet whenever. The gathered information has just been used for academic reasons, and no business use of information has happened. Information for auxiliary data was accumulated from dependable sources. Later its legitimate use, the information was annihilated.

3. EMPIRICAL ANALYSIS

The study measures consumer readiness to accept plant-based alternatives to dairy products in Kolkata, India. This readiness is measured through statistical tools like percentage, descriptive, independent sample t-test, and exploratory factor analysis. Percentage analysis presents the various categories and the number of observations. The results are presented in the form of tables and graphs. Descriptive statistics (mean and standard deviation) uses to present the quantitative description in a manageable form. It diminishes a lot of data into a simple form. An independent sample t-test is used to examine the dissimilarities between the independent (Male buyer readiness vs female buyer readiness) measurements. Finally, exploratory factor analysis examines the constructs (buyer readiness and determinants) and determines the nature of respective constructs in a specific area.

3.1. Level of buyer readiness

The percentage of buyer readiness for plant-based milk alternatives is presented below. Buyer readiness covers six stages: Awareness, knowledge, liking, preference, conviction, and purchase.

The purpose of the figure is to illustrate the buyer readiness for plant-based milk alternatives and their percentage. The average mean value of buyer readiness varies from 4.8 to 5.6, indicating a slight high buyer readiness of plant-based milk alternatives. In India, most respondents are aware of plant-based milk alternatives available in the market. The awareness and knowledge of plant-based milk alternatives is 18.10% and 17.4%, respectively. The liking of plant-based milk alternatives is 16.8%, but the buyer preference is 16.2% only. The conviction and the purchase of plant-based milk alternative is 15.9% and 15.5%, respectively. So, this section concludes that Indian buyers are at the awareness stage in particular to plant-based milk alternatives.
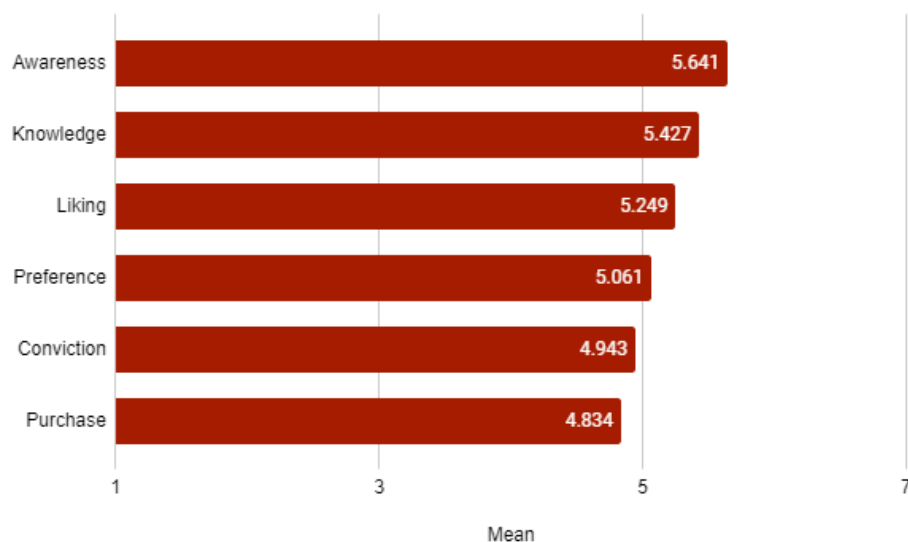
Figure 3. Buyer readiness of plant-based milk alternatives
Source: Author's calculation

Buyer readiness of various plant-based milk alternatives: In this section, the table present the results for one of four categories: soy drink, oats drink, almond drink, and rice drink. Buyer readiness of plant-based milk alternatives of all four drinks illustrates in the below figure. The illustrated figure aims to differentiate the buyer readiness level of various plant-based milk alternatives.

Table 1. Buyer readiness of various plant-based milk alternatives

Particulars	Soy drink		Oat's drink		Almond drink		Rice drink	
	mean	percent	Mean	percent	mean	percent	mean	percent
Awareness	5.471	17.5	5.567	18.1	5.665	18.4	5.863	18.5
Knowledge	5.400	17.3	5.397	17.5	5.353	17.4	5.556	17.5
Liking	5.365	17.1	5.311	17.2	5.093	16.5	5.227	16.5
Preference	5.033	16.1	5.097	16.5	5.040	16.3	5.075	16.0
Conviction	4.985	16.0	4.844	15.7	4.886	15.8	5.056	15.9
Purchase	4.983	16.0	4.586	14.9	4.797	15.6	4.969	15.7

Source: Author's calculation based on the opinion of plant-based milk alternative buyers

Soy drink: The soy drink buyers are aware of products to 17.5%, and almost 17.3% have product knowledge. Liking of plant-based milk alternative is 17.1%, preference is 16.1%, conviction is 16%, and the same percentage of buyers purchase the products.

Oat's drink: The oat drink buyers' awareness about availability is 18.1%, 17.5% knowing about the product, but 17.2% liking the product. Buyers are ready to prefer the product at 16.5%; conviction is 15.7%, and 14.9% of respondents purchase products in the market.

Almond drink: The buyers' awareness and knowledge are 18.4% and 17.5%, respectively. Liking of Almond drink of buyers is 16.5%, preferences are 16.3%, conviction is 15.8%, but 15.6% consume the products in the market.

Rice drink: The rice drink buyer awareness and knowledge are 18.5% and 17.5%. Liking of product is 16.5%, preference is 16%, conviction is 15.9% but 15.7% of purchases the product in the market.
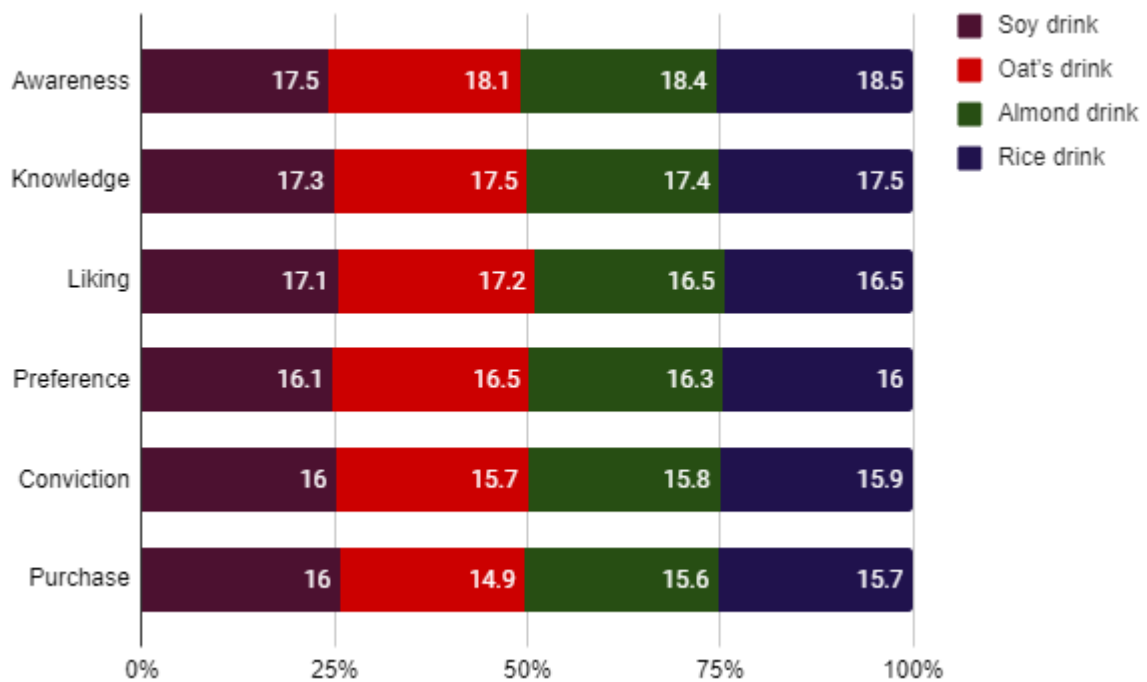
Figure 4. Buyer readiness of various plant-based milk alternatives
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

Level of buyer readiness of plant-based milk alternatives: The first stage of readiness is awareness which finds high in rice drink, moderate in oats and almond drink and less in soy drink. The second stage is knowledge, which is observed high in oats and rice drinks and slightly moderate in almond and soy drinks. The third is the Liking stage buyers is high in oats drink, moderate in soy drink and a lower percentage in almond and rice drink. In the preference, buyers of all the drinks are more than 16% in the fourth stage. The fifth stage is purchase finds high in soy drink, moderate in

almond and rice drink and less in oats drink. To sum up the buyer readiness level, the average percentage of overall buyer readiness is quite higher than 15%, indicating a low level of buyer alternatives for plant-based milk alternatives of consumers in India.

Next, a detailed description of the demographic profile of plant-based milk alternatives is described below. Plant-based milk alternative consumer information of age, gender, education qualification, occupation, income, and place of residence have been considered. Such information gathers from the respondents through open-ended and close-ended questions. The open-ended questions are age and annual income, whereas the others are close ended. All the questions assess using frequency distribution. The results of frequency distribution show the information in a percentage format. A detailed description of plant-based milk alternative consumer information presents below.

Firstly, the age of respondents is classified into subcategories. These subcategories are 18-25 years, 26-37 years, 38-45 years, 46-57 years and above 57 years. The frequency distribution tool applies to subcategories of age. Such tools application reveal that most respondents are between 26-37 years (55.5%). A moderate percentage of consumers are 18-25 years (20%) and above 57 years (14.5%), respectively. Finally, the least per cent of consumers are in the age category of 46-57 years (7.3%) and 38-45 years (2.7%), respectively.

Secondly, the gender of plant-based milk alternative consumers is classified into male and female, respectively. The highest number of consumers are male (61.8%), whereas only a relatively small number of females (38.2%) participated in the survey. As a result, male consumers dominate plant-based milk alternatives more than females.

Thirdly, the education qualification of respondents is classified into one of four categories: secondary education, graduates, postgraduates, and diploma holders. The present study has the highest with postgraduates (38.2%) - as compared with diploma holders (16.4%) and secondary education (11.8%).

Fourthly, the occupation of respondents covers five subcategories: students, business, housewife, private employees, and government employees. The result of the frequency distribution tool indicates that the highest percentage, 36.4%, are government employees is followed by private employees (21.8%), students (16.4%)- by business (13.6%) and housewives (11.8%)

Fifthly, the annual income of respondents is classified into five subcategories: Euro 500 to 1200, Euro 1201 to 1800, Euro 1801 to 2335, Euro 2336 to 2920 and more than 2921 Euro. Annually, the average income of plant-based milk alternatives consumers is 23.6% (Euro 2336-2920), further to 20.9% (Euro 500-1200), 20% (Euro 1201-1800), 18.2% (Euro 1801-2335) while other consumers (17.3%) are earning more than 2921 Euro. Finally, the highest number of plant-based milk alternative consumers' incomes is between 2336-2920 Euros.

Finally, the place of residence is classified into three subcategories: urban, rural, and semi-urban areas. The frequency distribution tool measures the respondent's percentage on the place of residence. These results indicate that the majority of respondents, even resided in urban areas, semi-urban areas (16.4%) have less in common with rural residents (40.9%)

Consumption frequency of plant-based milk alternatives: Consumption frequencies are classified into seven categories: very often, sometimes, rarely, never, always, almost always and have not tried. These frequencies were measured using frequency distribution, and the results reveal that most respondents sometimes consumed milk. A relatively moderate number of respondents (18%) have it rarely, very often (14%), never (11%), always & have not tried (9%), respectively. Finally, a small number of respondents have the consumption of plant-based milk alternatives always

Consumer preference for plant-based milk products: Consumer preferences are categorized into five benefits: Financial, environment, health, convenience and sensory. It is noted that 28.2% have preferred the products to have environmental benefits, 12.7% have weight benefits, 6.4% have ethical benefits, an identical 40.9% have health benefits, 6.4% have the convenience and financial benefits, and 5.5% have wellbeing and contentment benefits. Therefore, it is found that consumers who prefer plant-based milk products are primarily due to health benefits.

Satisfaction regarding consuming plant-based milk products: The researcher measures the satisfaction of consuming plant-based milk products with a five-scale. Out of 100 respondents, 44.5% of consumers are satisfied with the plant-based milk products, 32.7% have a neutral opinion regarding products, and 14.5% are very dissatisfied. Despite high satisfied consumers, plant-based milk alternatives have a relatively small percentage of dissatisfaction (4.5% and 3.6% of high dissatisfaction).

Consumers' preference for various plant-based milk alternatives: The study considers the various plant-based milk alternative products: oats drink, almond drink, rice drink, and soy drink. The vast majority of consumers prefer almond drinks (39.1%). A moderate percentage of consumers prefer (29.1%) are drink and drink (16.4%). Finally, a relatively small percentage of respondents prefer soy drinks (15.5%).

3.2. Mean and standard deviation

Consumer Preference of plant-based milk alternatives: The study measures the preference for plant-based milk alternatives through a seven-point Likert scale. Plant-based milk alternatives are oats drink, almond drink, rice drink and soy drink. These plant-based milk alternatives evaluate with the help of mean and standard deviation. The average mean for all the plant-based milk alternatives varies between 5.05-5.60. The highest mean value represents the almond drink (5.60), indicating a high accuracy and precision. The least mean value is soy drink (5.05), indicating a low accuracy and precision. As a result, most consumers' preference gives more to almond drinks.
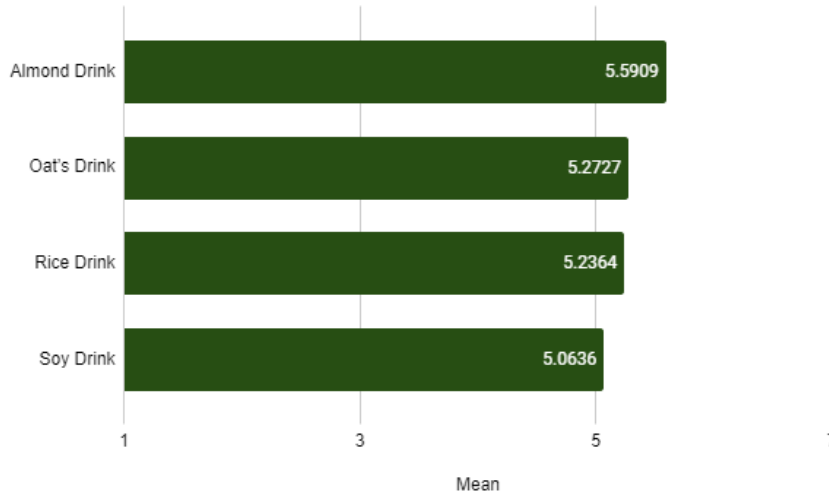

Figure 5. Preference for a plant-based alternative to milk
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

Level of buyer readiness: The level of buyer readiness includes awareness, knowledge, liking, preference, conviction, and purchase. The researcher measures all the aspects through seven-point Likert scales.

Awareness contains statements like seeking information from friends to make a final decision, more attention paid to consumer awareness program, too few consumers read magazines, newspaper, and TV, deserves support from consumers, price is the option to choose the products, products offered at a discount price then the respondents more tempted to buy the products and always the respondents compare similar products on the store. The average mean value of the awareness constructs is between 4.95-5.15, representing the slightly high awareness and precision of buyers. Next, standard deviation values indicate the accuracy of awareness of buyers. The average values of awareness range from 1.64 to 1.77, indicating a low accuracy. Overall, the overall precision and accuracy of buyer awareness are 5.06 and 1.72, respectively.

Figure 6. Awareness level of buyer readiness
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

The second level of buyer readiness is knowledge which measures using the statements. Statements representing the knowledge are knowledge about the products, familiarity, and recognition of the benefits and know well about plant-based milk alternatives. The average value of knowledge of plant-based milk alternatives ranges from 4.8 to 5.27, indicating a relatively high precision of knowledge of buyers. Similarly, the standard deviation of knowledge lies between 1.67-1.83, representing low accuracy of knowledge. So, the overall precision and accuracy of knowledge are 5 and 1.79, respectively.

Figure 7. Knowledge of buyer readiness
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

Liking is the third stage in buyer readiness of plant-based alternatives to milk products. Appearances, aroma, flavour, texture, and quality indicate liking. The average level of liking varies from 5.1 to 5.6, indicating a relatively high precision for liking plant-based alternatives to milk products. Similarly, the average standard deviation values range between 1.3-1.5, indicating a low accuracy for the liking stage. Overall, the precision and accuracy of liking are 5.4 and 1.4, respectively.

Figure 8. Liking level of buyer readiness
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

The fourth stage of the level of buyer readiness is preferences, and the statements represent health, daily nutritional needs, animal welfare, ethical considerations, and environmental concern. The average mean value of preference lies between 5.45 and 5.95, indicating a relatively high preference for plant-based alternatives to milk products. Similarly, the average standard deviation value ranges from 1.3 to 1.6, representing a low accuracy for preferences of plant-based alternatives to milk products. So, the overall precision and accuracy of preferences are 5.6 and 1.5, respectively.
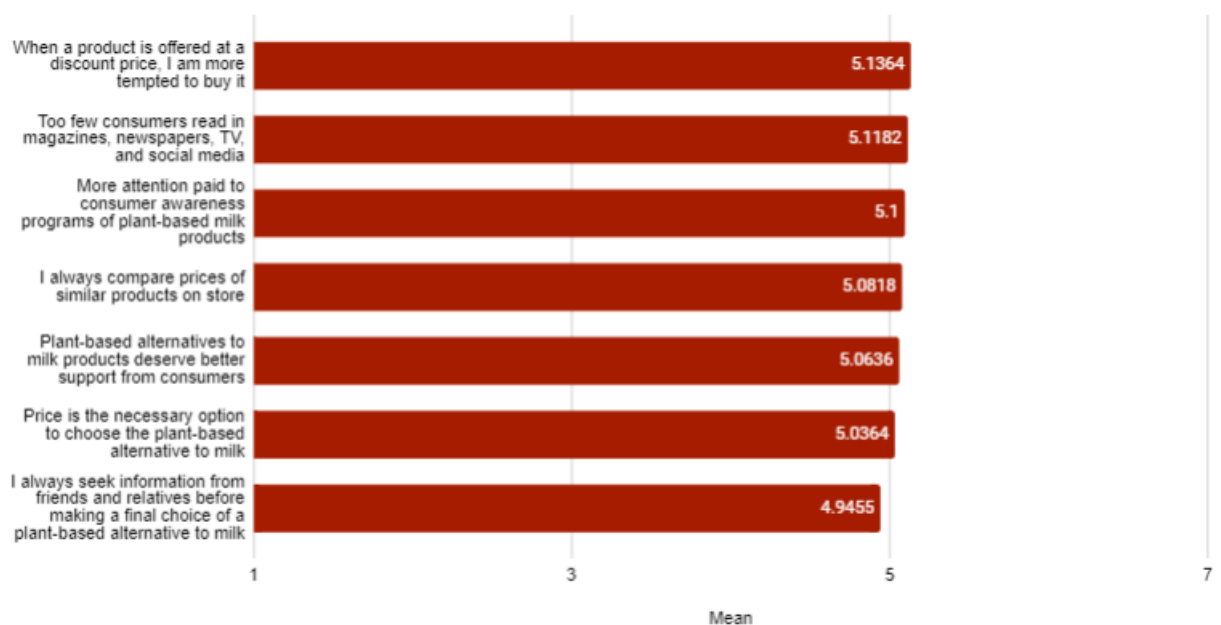

Figure 9. Preference level of buyer readiness
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

The fifth level of buyer readiness is conviction. The statements indicating conviction are respondents did not hide a consuming plant-based alternative to milk from others, plant-based alternative to milk is an essential aspect of life, no doubts that a plant-based alternative to milk is suitable for the respondents or for everyone, willing to sacrifice anything to remain a plant-based alternative to milk users. Also, other aspects like encouraging others to become a plant-based alternative to milk users, consider consuming plant-based alternative to milk when making an important decision in life, try to carry my plant-based alternative to milk into all my other dealings in life, try to carry plant-based alternative to milk into all my other dealings in life and live a life with a plant-based alternative to milk. The average value of conviction lies between 4.70 and 5.15, indicating a quite high level of precision for a conviction for a plant-based alternative to milk products. The standard deviation for conviction ranges from 1.7 to 1.9, indicating a low level of

accuracy for the conviction stage. So, the overall precision and accuracy of conviction are 4.9 and 1.8, respectively.
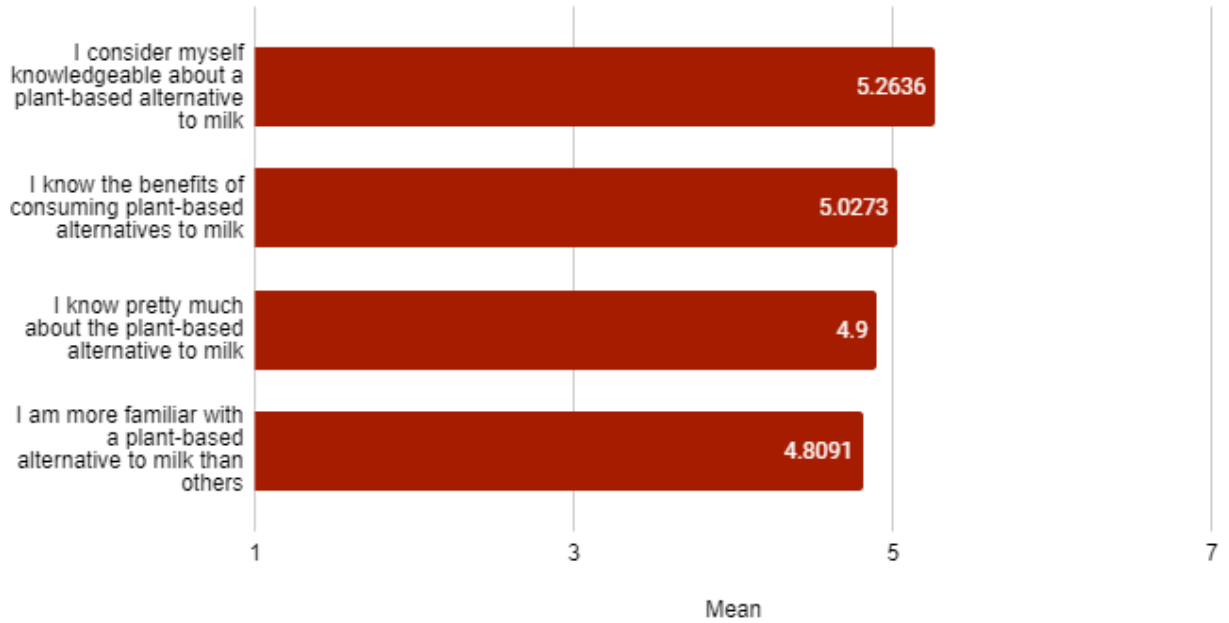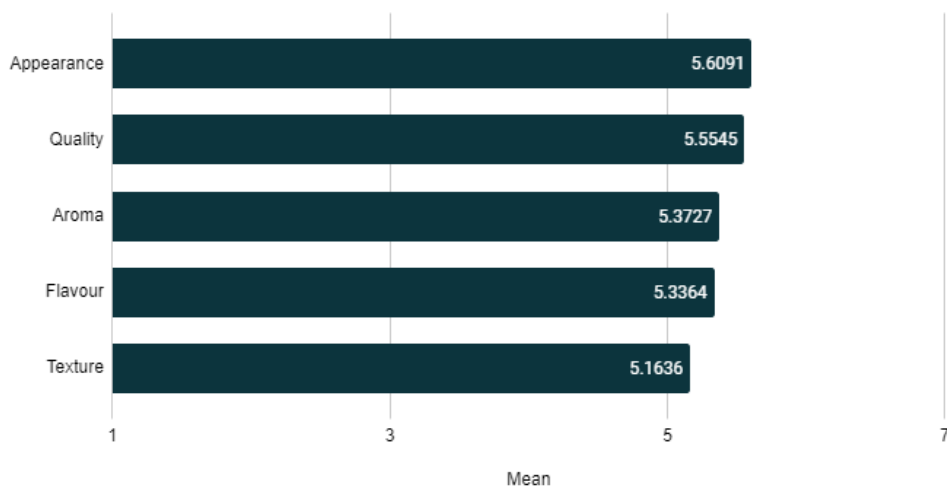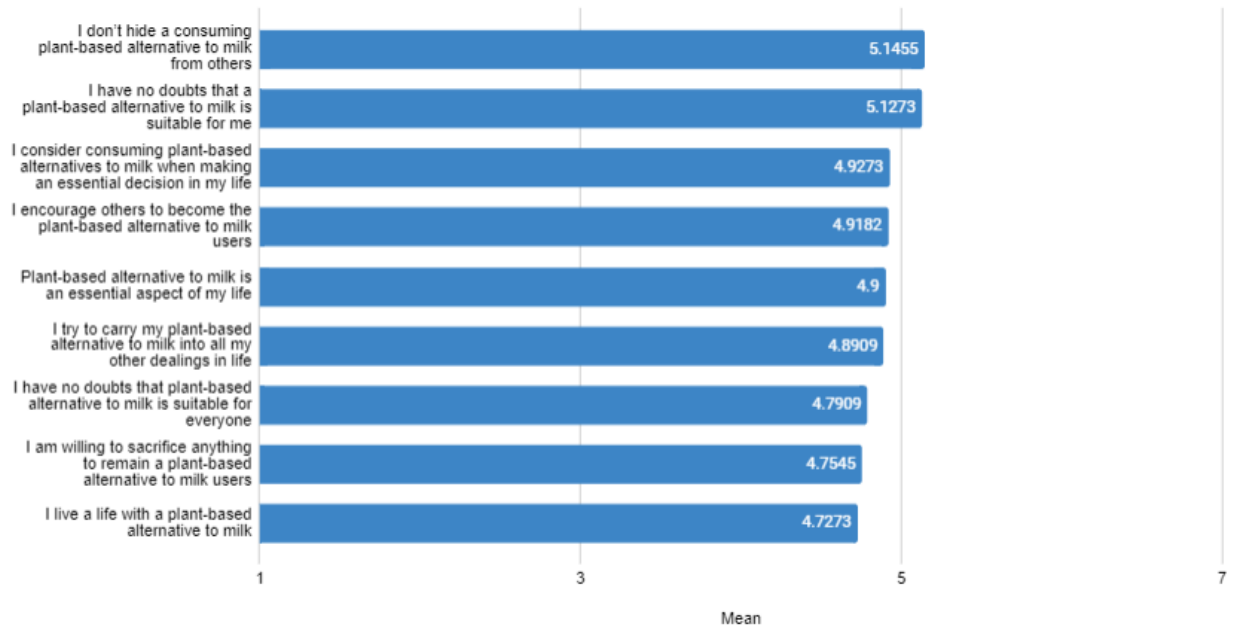

Figure 10. Conviction level of buyer readiness
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

The last stage of buyer readiness is purchase and the statements indicating purchases are happy to buy plant-based alternatives to milk products, hope in consuming plant-based alternatives to milk products, willing to buy plant-based alternative to milk products, plan in consuming plant-based alternative to milk products and intend to buy a plant-based alternative to milk products in the next few days. The average purchase value lies between 4.90 and 5.4, indicating a relatively high level of precision for purchasing a plant-based alternative to milk products. The standard deviation of purchases varies from 1.6 to 1.7, representing a low accuracy for purchasing plant-based alternatives to milk products. So, the precision and accuracy of the purchase stages are 5.09 and 1.72, respectively.
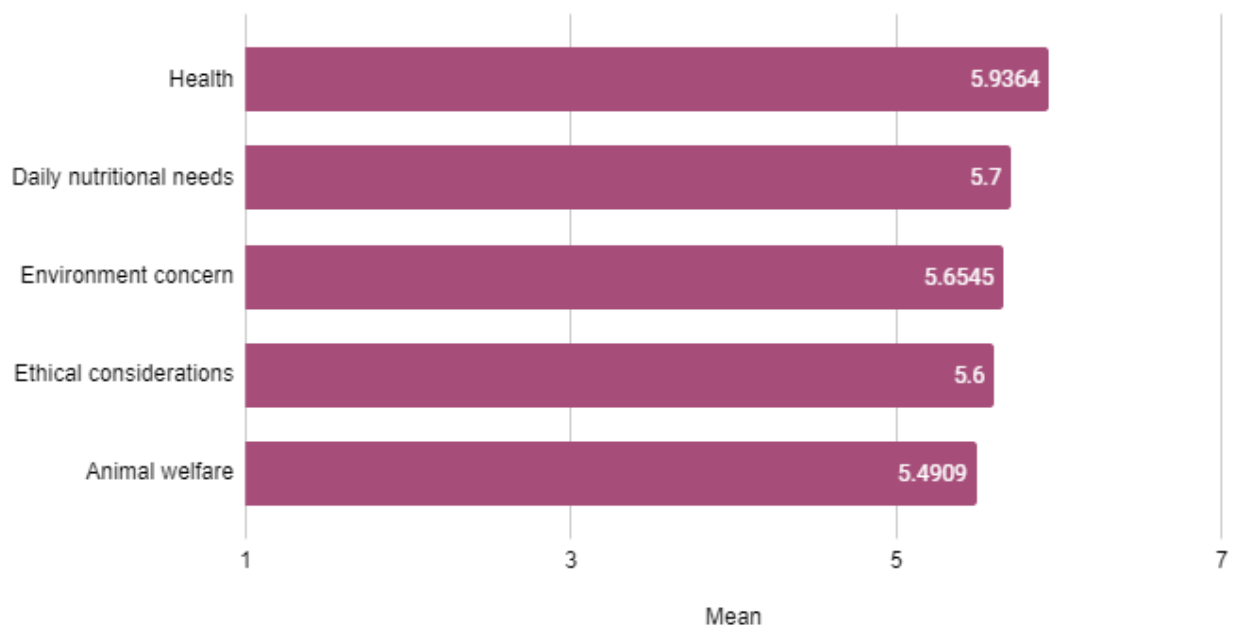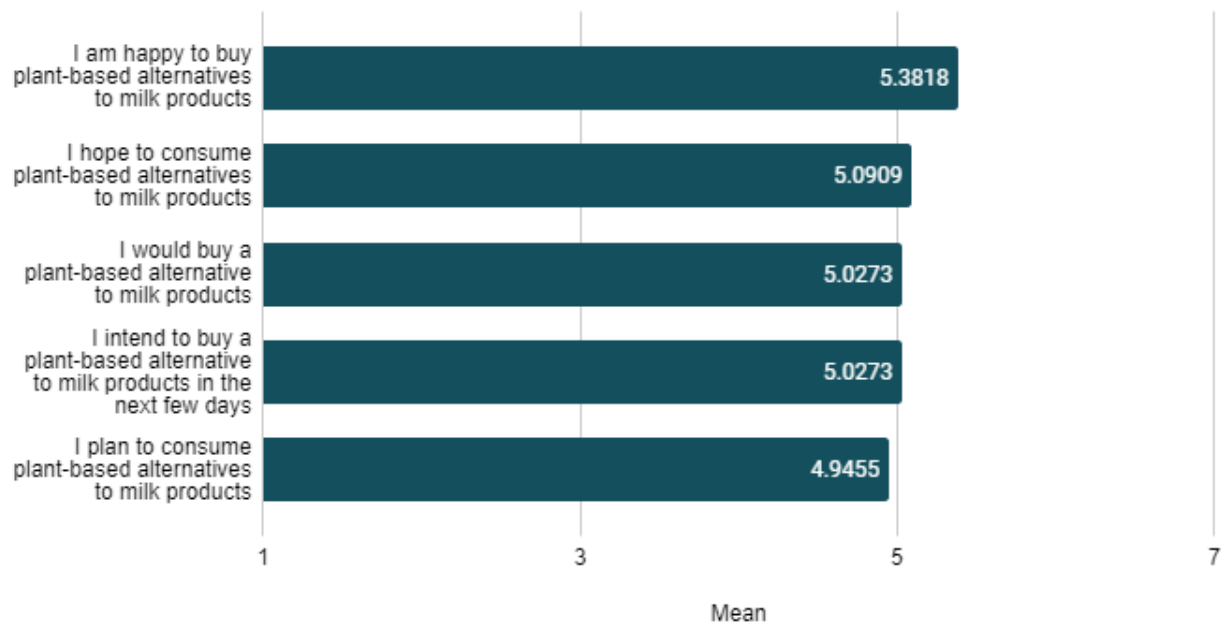
Figure 11. Purchase level of buyer readiness
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

Benefits of consuming plant-based alternatives to milk products: The financial benefits are saving time & money, food storage problems and tastes good. These benefits are measured in a seven-point Likert scale. The average value of financial benefits varies from 5 to 5.15, indicating a relatively high level of precision for financial benefits. The standard deviation of financial benefits lies between 1.6- 1.7, representing a low accuracy level for financial benefits. So, it concludes that the maximum number of respondents believe that a plant-based alternative to milk saves the buyers time and money.

Figure 12. Financial benefits of buyer readiness of plant-based alternative to milk
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

The environmental benefits indicate global warming & pollution, protecting animals, increasing production, and protecting the production and protecting the environment. The average mean value of environmental benefits ranges from 4.90 to 5.10, indicating a relatively high precision for environmental benefits. On average, the standard deviation values lie between 1.6-1.7, representing a low accuracy for environmental benefits. As a result, most respondents believe that a plant-based alternative to milk products reduces global warming and environmental pollution.
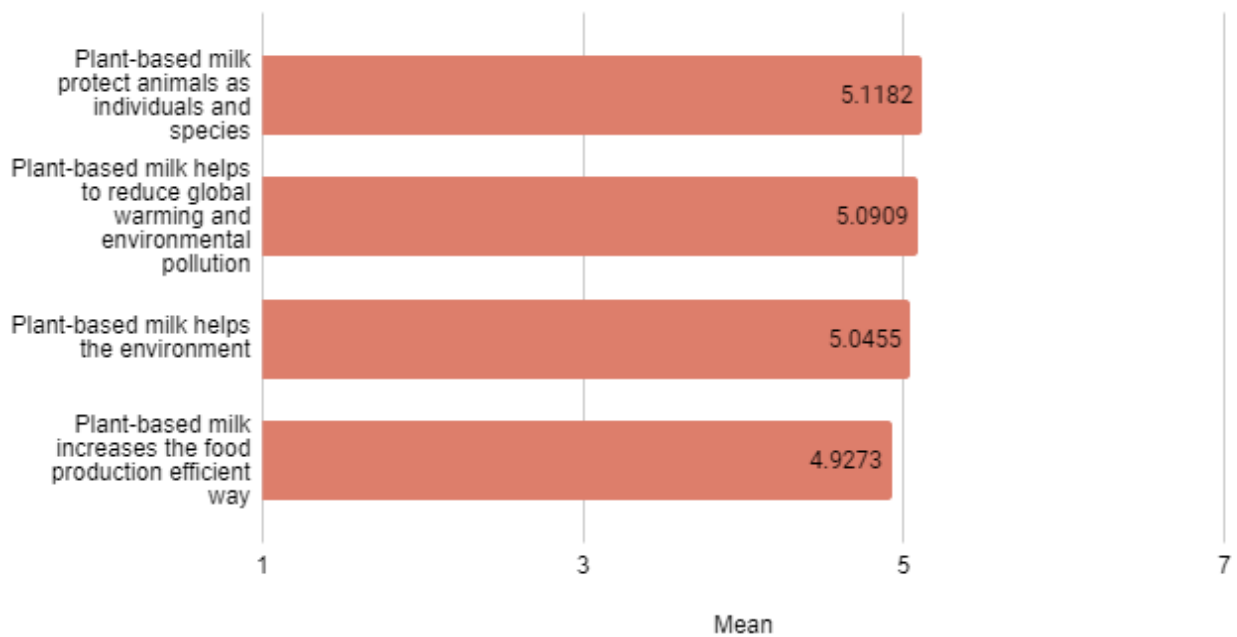
Figure 13. Environment benefits of buyer readiness of plant-based alternative to milk
 Source: Author's calculation based on the opinion of plant-based milk alternative buyers

Health benefits represent the statements of nutrition, vitamins & minerals, and plenty of energy. The average mean value of health benefits ranges between 5.10 and 5.3, indicating a relatively high precision for health benefits. The standard deviation for health benefits ranges from 1.6 to 1.7, representing a low health benefits accuracy. So, it concludes that most respondents state that plant-based alternative to milk product is nutritious.
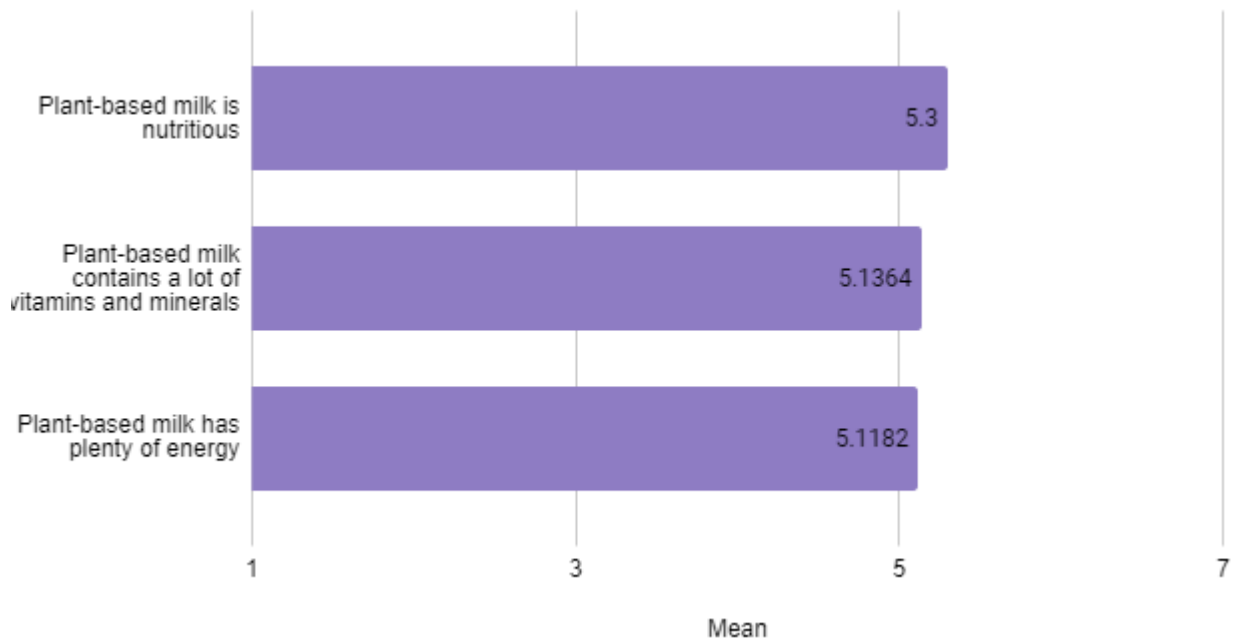
Figure 14. Health benefits of buyer readiness of plant-based alternative to milk
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

The convenience of buyers is another benefit of plant-alternative to milk products. The statements indicating convenience are available in shops and supermarkets, excellent looks and smell and a pleasant texture. The average mean value of convenience lies between 4.85 and 5.15, indicating a relatively high precision for convenience. The standard deviation of convenience ranges from 1.62-1.5, representing a low accuracy.
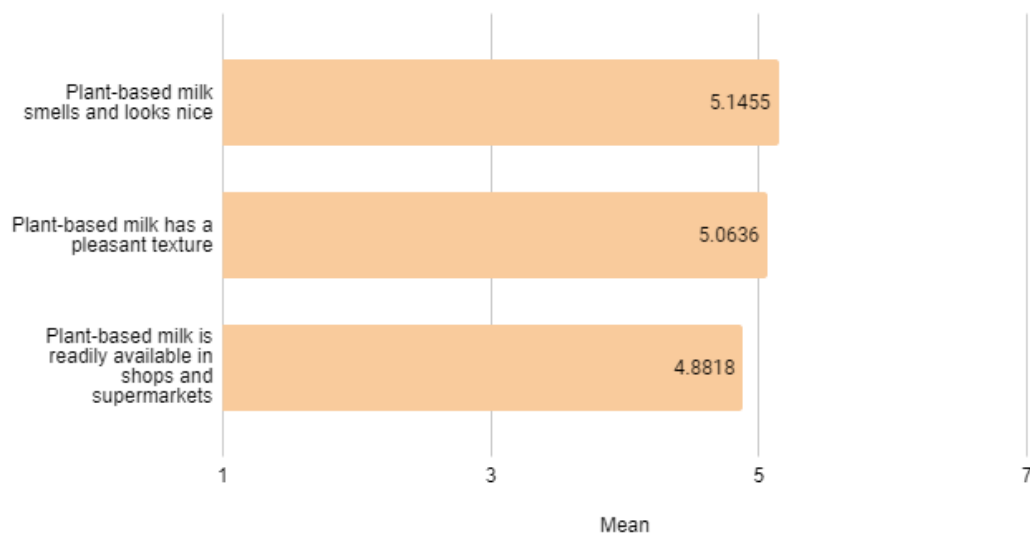
Figure 15. The convenience of buyer readiness of plant-based alternative to milk
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

Sensory benefits represent the statements: taste good, low in calories and fat, control weight, and reduce the risk of chronic diseases. The average value of sensory benefits lies between 4.95 and 5.07, indicating a relatively high precision. Similarly, the average standard deviation value ranges from 1.6 to 1.8, representing a low precision. So, it concludes that most respondents state that plant-based alternatives to milk products reduce the risk of developing chronic diseases.
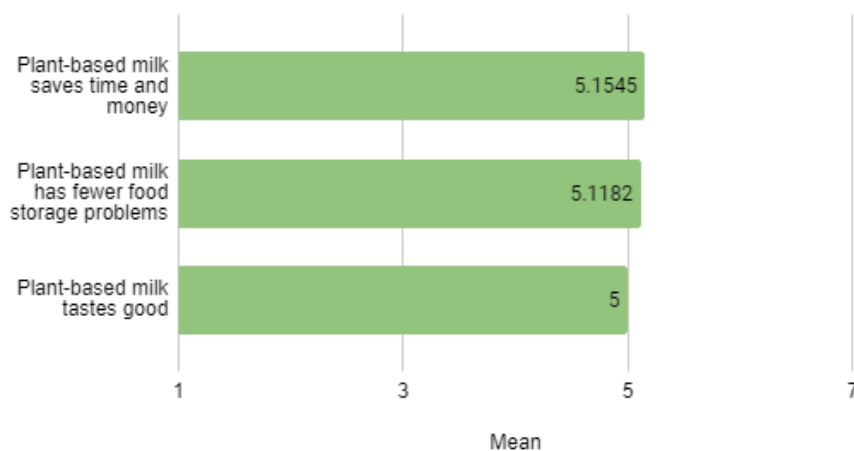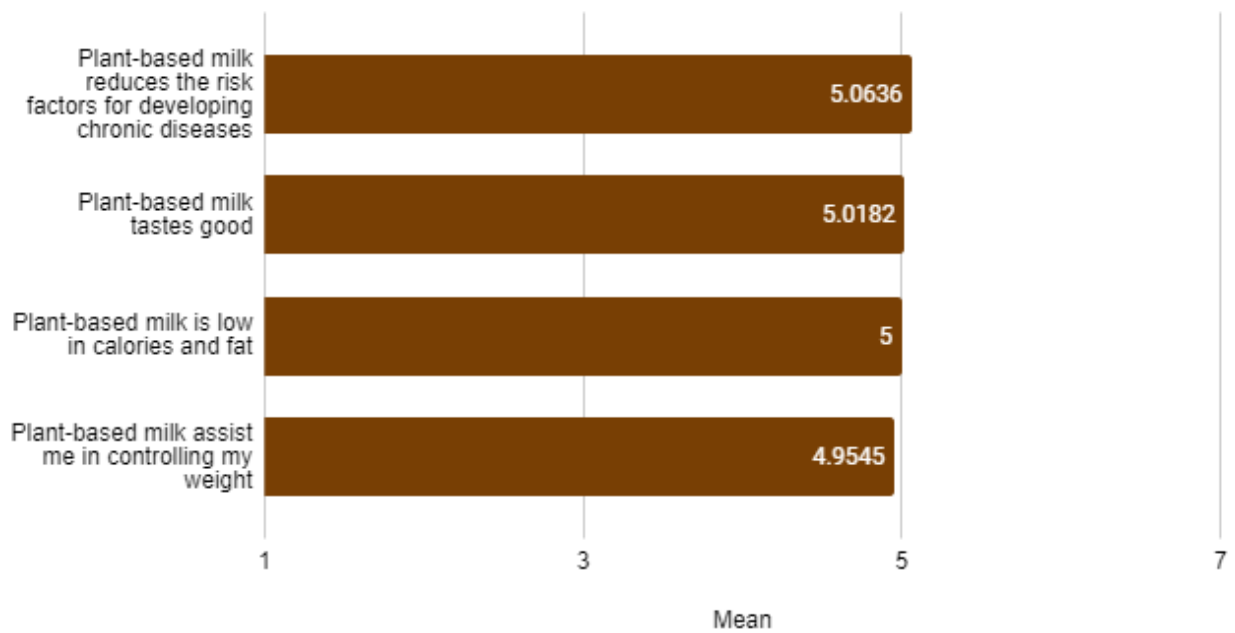

Figure 16. Sensory of buyer readiness of plant-based alternative to milk
Source: Author's calculation based on the opinion of plant-based milk alternative buyers

3.3. Hypothesis testing

Gender differences for the six stages of buyer readiness: The section measures the gender differences for the buyer readiness level. Awareness, knowledge, liking, preference, conviction, and purchase are level of buyer readiness. These stages measure how the differences between male and female consumers. Such differences are measured using an independent sample t-test.

Table 2. T-test to determine the difference of level of buyer readiness between male and female

Gender		mean	std. deviation	t	Sig
Awareness	Male	5.0210	1.55893	.286	.594
	Female	5.1463	1.34881		
Knowledge	Male	4.9154	1.72915	1.246	.267
	Female	5.1369	1.50325		

Liking	Male	5.3735	1.35069	.297	.587
	Female	5.4619	1.14038		
Preference	Male	5.6941	1.33628	.436	.510
	Female	5.6476	1.36422		
Conviction	Male	4.8742	1.76518	1.185	.279
	Female	4.9656	1.51625		
Purchase	Male	5.0765	1.72117	1.460	.230
	Female	5.1238	1.34487		

Source: Author's calculation

H_1: Male buyer readiness awareness differs from female buyers.

Awareness: The precision for female and male respondents are 5.14 and 5.02, respectively. An independent sample t-test revealed that male buyer readiness is not significantly dissimilar to female buyers, t=0.28; p>0.05.

H_2: The knowledge of male buyer readiness differs from female buyers.

Knowledge: The precision of knowledge for female and male respondents are 5.13 and 4.9, respectively. An independent sample t-test revealed that male buyer readiness knowledge is not significantly dissimilar from female buyers; t=1.426; p>0.005.

H_3: The liking of male buyer readiness differs from female buyers.

Liking: It is observed that the liking of buyer readiness for female respondents is 5.46, whereas male respondents are 5.37. As the t-test value of 0.297 is lesser than the critical value with the same doff at a 5% significance level, I accept the null hypothesis and conclude that the liking of male buyer readiness did not differ from female buyers.

H_4: The preferences of male buyer readiness differ from female buyers.

Preference: The average preference value is high in male respondents (5.69), whereas less in female respondents (5.64). As the t-test value of 0.436 is lesser than the critical value with the same doff at a 5% significance level, I accept the null hypothesis and conclude that the preferences of male buyer readiness did not differ from female buyers.

H_5: The conviction of male buyer readiness differs from female buyers.

Conviction: In the conviction stage, the average value of male and female buyers is 4.87 and 4.96, respectively. An independent sample t-test revealed that male buyer readiness conviction is not significantly dissimilar from female buyers; t=1.185; p>0.005.

H$_6$: The purchase of male buyer readiness differs from female buyers.

Purchase: In the purchase stage, the mean value of female and male respondents is 5.12 and 5.0 7, respectively. An independent sample t-test revealed that the purchase of male buyers is not significantly dissimilar from that of female buyers; t=1.426; p>0.005.

From the above analysis, it is clear that the precision is high in female respondents for five stages: awareness, knowledge, liking, conviction, and purchases. Precision is high in male respondents for the preference stage. To sum up the analysis, the results of all the buyer readiness stages are not statistically significant. So, it concludes that male buyer readiness did not differ from female buyers.

Gender differences for the determinants of buyer readiness: The section measures the differences of determinants of buyer readiness in terms of gender. The determinants of buyer readiness are classified into five benefits: Financial benefits, environmental benefits, health, convenience, and sensory benefits. These determinants evaluate how differences of male and female consumers vary, and the results present below

Table 3. T-test to determine the differences of determinants of buyer readiness in terms of gender

Gender		mean	std. deviation	t	Sig
Financial benefits	Male	5.0441	1.44197	1.375	.243
	Female	5.1667	1.58285		
Environment benefits	Male	5.0404	1.63600	1.132	.290
	Female	5.0536	1.42017		
Health	Male	5.1471	1.65457	.787	.377
	Female	5.2460	1.47069		
Convenience	Male	5.0441	1.58235	.029	.866
	Female	5.0079	1.52395		
Sensory	Male	5.0037	1.63080	.637	.426
	Female	5.0179	1.49837		

Source: Author's calculation

H$_1$: Financial benefits vary among male and female respondents

Financial benefits: The mean value of financial benefits is high in female respondents (5.16), whereas less in male respondents (5.04). As a t-test value of 1.375 and is lesser than the d.o.f at a

5% significance level, I accept the null hypothesis that financial benefits did not vary among male and female respondents.

H_2: Environment benefits vary among male and female respondents

Environmental benefits: The average precision for female respondents is 5.05, and male respondents are 5.04, indicating a relatively high precision for environmental benefits. As a t-test value of 1.132 and is lesser than the d.o.f at a 5% significance level, I accept the null hypothesis that environmental benefits did not vary among male and female respondents.

H_3: Health benefits vary among male and female respondents

Health benefits: The average mean value of male and female respondents is 5.24 and 5.14, respectively. As a t-test value of 0.787 and is lesser than the d.o.f at a 5% significance level, I accept the null hypothesis that health benefits did not vary among male and female respondents.

H_4: Convenience benefits of buyer readiness varies among male and female respondents

Convenience benefits: The average mean value for male and female respondents are 5.0 and 5.04, respectively. As a t-test value of 0.029 and is lesser than the d.o.f at a 5% significance level, I accept the null hypothesis that convenience benefits did not vary among male and female respondents

H_5: Sensory benefits vary among male and female respondents

Sensory benefits: It is observed that the average precision for male and female respondents are 5.00 and 5.01, respectively. As a t-test value of 0.067 and is lesser than the d.o.f at a 5% significance level, I accept the null hypothesis that sensory benefits did not vary among male and female respondents.

To sum up the analysis, determinants of buyer readiness (sensory benefits, health, environment, and financial benefits) is higher in females and lesser in males. Despite the above benefits, convenience benefits are higher in males and lesser in females. In all the benefits, the values of determinants are not statistically significant. So, there is no difference in determinants of buyer readiness for male and female buyers.

3.4. Explanatory Factor Analysis for the level of buyer readiness

The KMO value of the buyer readiness level is 0.943, which indicates that Kaiser (1975) stated that the KMO value is more than 0.9, which implies that the variable is marvellous, and the sample is adequate. So, the researcher continued the analysis, and the Chi-square value is 4591.808, and the significance value is 0.000, which is statistically significant at a 5% significance level.

Table 4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.943
Bartlett's Test of Sphericity	Approx. Chi-Square	4591.808
	Df	595
	Sig.	.000

Source: Author's calculation

Communalities indicate how much of the variation in the variables has been compensated for by the factors derived. Each vector and the variance in communalities are expressed. The ranges from 0.648 to 0.873. High load finds in the statement "I try to carry my plant-based alternative to milk into all my other dealings in life" because the total variance of the statement is 87.3%.

The total variance explained table demonstrates that each of the retrieved components. A component is defined as the sum of all possible values for each variable. The eigenvalue of a component indicates the fraction of variation explained by the component. Kaiser's Criterion (1958) states that only components having an eigenvalue of 1.0 or above should be maintained for analysis purposes. However, four components with an eigenvalue greater than 1.0 account for nearly 76.270 percent of the total variance. The highest percentages of total variance explained suggest a significant relationship between the variables in this study.

The screen plot indicates that the continuous flow of factors begins from the second factor onwards. This curve is also difficult to understand because after the second factor, the curve tails off, yet another spike in the next factor, and a steady plateau is hit before the end.
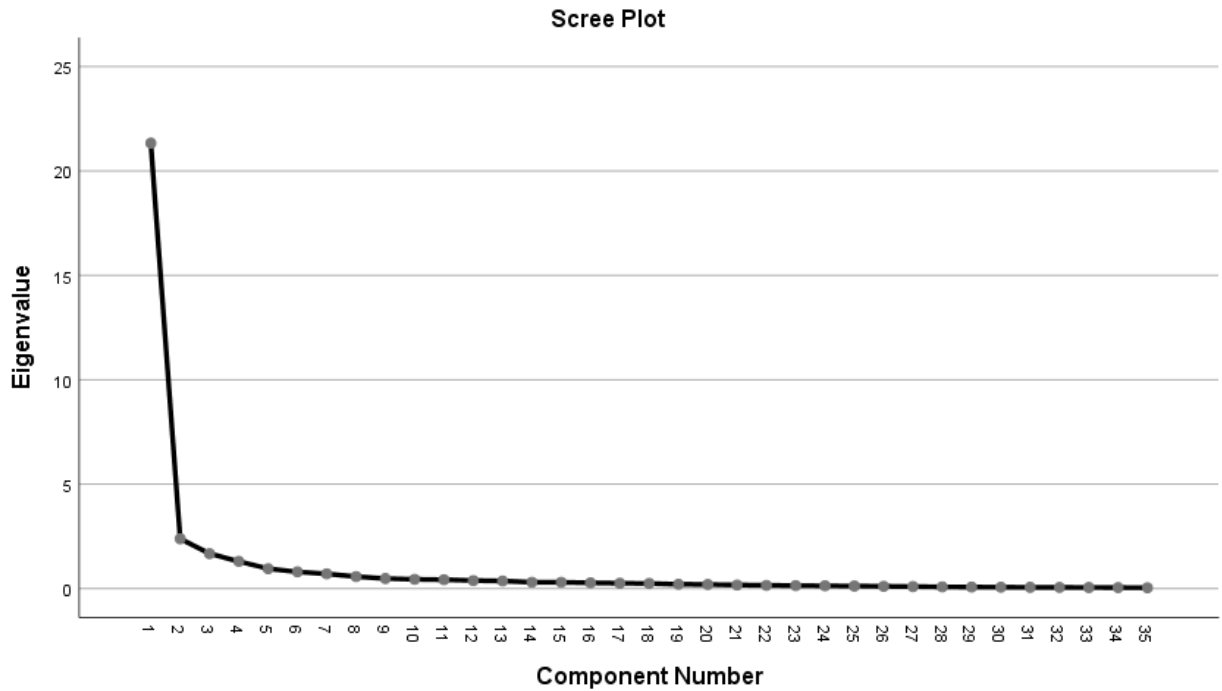
Figure 18. Screen plot
Source: Author's calculation

The rotated Component Matrix table shows that factors were classified into two categories. Each of the variables is labelled with the highest-scoring score for that performance. It is worth explicitly stating that factor loadings greater than 0.50 are important. 0.60 is considered more important, whereas 0.70 or above is considered extremely important. Hence, the research suppressed all loadings less than 0.5 in the appendix, which indicate the gap.

The first factor is termed as conviction and purchase comprises the statement such as respondents did not hide a consuming plant-based alternative to milk from others, plant-based alternative to milk is an essential aspect of life, no doubts that a plant-based alternative to milk is suitable for the respondents or for everyone, willing to sacrifice anything to remain a plant-based alternative to milk users. Also, other aspects like encouraging others to become a plant-based alternative to milk users, consider consuming plant-based alternative to milk when making an important decision in life, try to carry my plant-based alternative to milk into all my other dealings in life, try to carry plant-based alternative to milk into all my other dealings in life and live a life with a plant-based alternative to milk. However, respondents happy to buy plant-based alternatives to milk products, hope in consuming plant-based alternatives to milk products, willingness to buy plant-based alternative to milk products, plan in consuming plant-based alternative to milk products and intend

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to buy a plant-based alternative to milk products in the next few days with loading ranging from 0.630 to 0.847. Thus, the factor load is higher than 0.6 and concluded that the conviction and purchase of plant-based alternative milk are extremely important.

The second factor is a liking and preference of buyer readiness variables such as appearance, aroma, flavour, texture, quality, and preference include health, daily nutritional needs, animal welfare, ethical considerations, and environmental concern with loading ranging from 0.514 to 0.775. Hence, it is evident that the factor load is higher than 0.5, representing the liking and preference of buyer readiness is important.

The third factor indicates the awareness of buyer readiness like seeking information from friends to make a final decision, more attention paid to consumer awareness program, too few consumers read magazines, newspaper, and TV, deserves support from consumers, price is the option to choose the products, products offered at a discount price then the respondents more tempted to buy the products and always the respondents compare similar products on the store with loading varying from 0.591 to 0.711. Thus, it is found that the factor load is higher than 0.5, which represent the awareness that the buyer readiness factor is more important.

The fourth factor indicates the awareness of buyer readiness like seeking information from friends to make a final decision, more attention paid to consumer awareness program, too few consumers read magazines, newspaper, and TV, deserves support from consumers, price is the option to choose the products, products offered at a discount price then the respondents more tempted to buy the products and always the respondents compare similar products on the store with loading varying from 0.647 to 0.768. Thus, it is found that the factor load is higher than 0.6, which represent the awareness that the buyer readiness factor is more important.

The last factor is termed as a buyer readiness of knowledge, which indicate the statements include the respondents consider knowledgeable about the products, more familiar about the products than others, Knowing the benefits of consuming plant-based milk alternatives, and pretty much about the plant-based alternative to milk with loading ranging from 0.567 to 0.755. Hence, it is evident that the factor load is higher than 0.5, which shows that the factor load of the buyer readiness of knowledge is important.

3.5. Explanatory Factor Analysis for determinants of buyer readiness benefits

The present study has a KMO value of 0.939 (KMO > 0.5). These values imply that the sample is adequate, and the study can continue with the factor analysis. The Chi-square value is 2225.062, and it is significant (p<0.05) as the values indicate to proceed further with factor analysis.

Table 5. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.939
Bartlett's Test of Sphericity	Approx. Chi-Square	2225.062
	Df	136
	Sig.	.000

Source: Author's calculation

Communalities indicates that how variables vary to derive the factors. These communalities express the communality, vector, and its variance. The variance ranges from 0.654 and 0.869, representing the high load for the statement ("Plant-based milk smells and looks nice"), having the total variance to 86.9%.

Total variance explains the seventeen components in that two main factors are substituted with a cumulative variance of 78.024. The percentage of variance has 7.468 and 5.796 separately. However, two components with an eigenvalue higher than 1.0 account for almost 78.024percent of the total variance. The highest percentages of total variance explained recommend a notable relationship between the variables in this study.

The screen plot indicates that the continuous flow of factors begins from the second factor onwards. Every following factor account for smaller and smaller quantities of the overall variance. This curve is hard to understand because after the second factor, the curve tails off, yet another spike in the next factor, and a steady plateau is hit before the end.
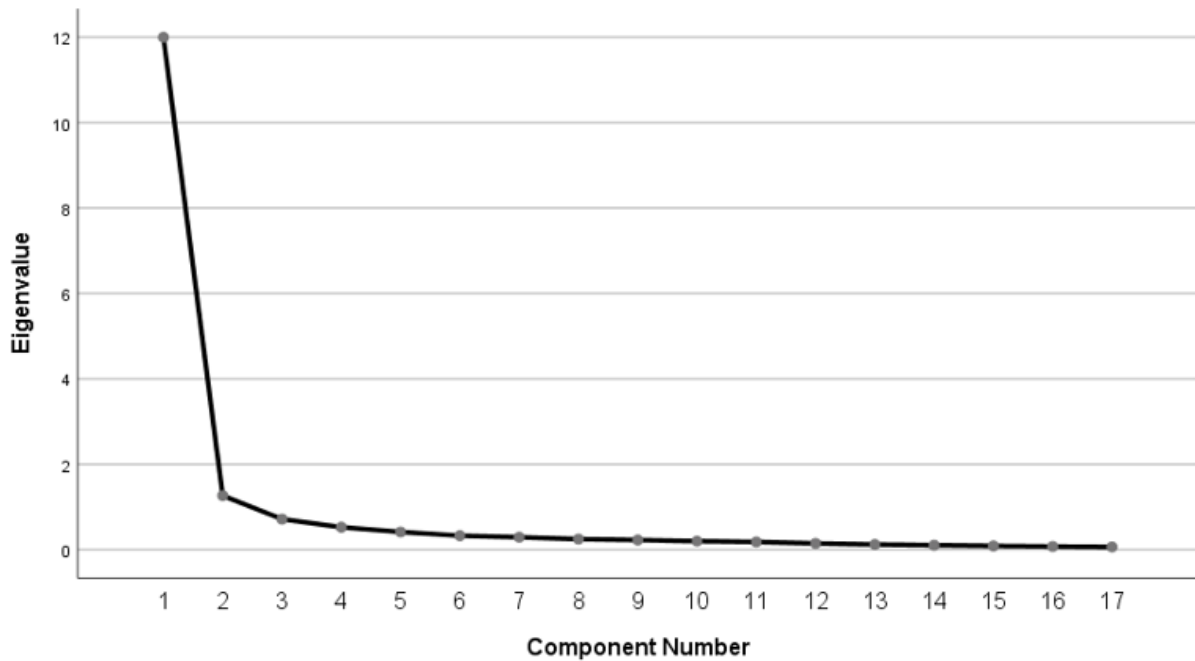
Figure 19. Screen plot
Source: Author's calculation

The rotated Component Matrix table shows that factors were classified into two categories. Each of the variables is labelled with the highest-scoring score for that performance. It is worth explicitly stating that factor loadings greater than 0.50 are important. 0.60 is considered more important, whereas 0.70 or above is considered extremely important. Hence, the research suppressed all loadings less than 0.5 in the above table, which indicate the gap.

The first factor represents the financial and environment benefits of consuming plant-based alternatives to milk products, which shows the statement such as saving time and money, having fewer food storage problems, tastes good, plant-based milk to reduce global warming and environmental pollution. It protects animals as individuals and species; plant-based milk increases food production efficiency and helps the environment with loading ranging from 0. 696 to 0.802. Hence, it is evident that the factor load is higher than 0.6, which shows that the factor load of the financial and environment benefits of consuming plant-based alternatives to milk products is more important.

The last factor is named as a benefit of consuming plant-based alternative to milk products, which represent the statement such as plant-based milk containing many vitamins and minerals, nutritious, having plenty of energy, readily available in shops and supermarkets, smells and looks excellent, has a pleasant texture, tastes good, is low in calories and fat, helps me control my weight,

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and reduces the risk factors for developing chronic diseases with loading differ from 0.707 to 0.864. Hence, the factor load is higher than 0.7 and concluded that the benefits of consuming plant-based alternatives to milk products are extremely important.

To sum up the analysis, determinants of buyer readiness (sensory benefits, health, environment, convenience, and financial benefits) is more significant for the financial and environmental benefits of consuming plant-based alternatives to milk products. In contrast, sensory, health, and convenience are extremely important. Thus, it concludes that the determinants of buyer readiness benefits are significant.

3.6. Results

The analysis results are summarized and discuss the main findings of the work. The researcher picked out the samples through the convenience sampling method. The opinion of the samples was gathered through a questionnaire. Assessment of opinion made with the help of statistical tools like percentage analysis, descriptive statistics, independent-sample t-test and exploratory factor analysis. All the descriptive statistics tools were performed with the help of SPSS software and Microsoft Excel.

Demographic profile: Most respondents were between 26-37 years and were male and postgraduates. These respondents were occupied in a government organization where their annual income was between Euro 2336 and Euro 2920.

Plant-based milk alternatives: Most respondents sometimes consumed plant-based milk whenever required. A very few had a habit of consuming milk every time. However, most consumption is determined based on the health benefits that exist in the products. The study identifies the highest preferred milk, like almond, whereas the least is soy milk. On the whole, plant-based milk users are satisfied with the products.

Level of buyer readiness stage: The awareness and knowledge of plant-based milk alternatives was 18.10% and 17.4%, respectively. The liking of plant-based milk alternatives is 16.8%, but the buyer preference was 16.2% only. The conviction and the purchase of plant-based milk alternative was 15.9% and 15.5%, respectively. On average, the percentage of overall buyer readiness is quite

higher than 15%, indicating a low level of buyer alternatives for plant-based milk alternatives of consumers in India.

Benefits: The benefits of financial, environmental, health, convenience and sensory were considered. Financially, a plant-based alternative to milk saved the buyers time and money. Environmentally, it reduced global warming and environmental pollution. Considering the health, it was nutritious to the buyers. The sensory benefits of the buyers were to reduce the risk of developing chronic diseases.

Level of buyer readiness differences in terms of Gender differences of buyer readiness stages: Buyer readiness stages contain awareness, knowledge, liking, preference, conviction, and purchase. Out of six stages, female-dominated more than males in five stages (awareness, knowledge, liking, conviction, and purchases). In contrast, Male preferences for plant-based milk alternatives was high than female. But the differences of male and female buyers were not statistically significant. So, it concludes that Male buyer readiness stages did not differ based on the female buyers.

Determinants of buyer readiness and its differences in terms of gender: The determinants (sensory benefits, health, environment, and financial benefits) were high in females, whereas less in males. But male precision was high in convenience and less in female buyers. Yet, there were no statistically significant differences in determinants of buyers. So, male determinants of buyer readiness did not differ from female buyers.

3.7. Discussion

The first section is to measure the demographic profile of respondents. The main intention of measuring age, gender, education, and income is an important indicator of consumer awareness. One study found that these parameters contribute most to consumer awareness (Büyükkaragöz *et al.* 2014). The present study found that Indian male consumers are more prone to plant-based milk alternatives than female consumers. These findings are quite contrary to those shown in the past studies Beardsworth *et al.* 2020; Michel *et al.* 2021; Hartmann, Siegrist 2017; Valgemäe n.d; Kiefer *et al.* 2015; Haas *et al.* 2019; Alae-Carew *et al.* 2021; Nguyen *et al.* 2020). Some of the other results of demographic information where the highest number of respondents are between

26-37 years; postgraduates; government employees and their annual income between Euro 2336-2920

Plant-based milk alternatives: The highest number of respondents consumed plant-based milk sometimes whenever they required it. A very few had a habit of consuming milk every time. However, most consumption is determined based on the health benefits that exist in the products. A similar observation is consistent with the past studies (Makinen *et al.,* 2016; Banovic *et al.* 2018; Peschel *et al.* 2019; Aschemann-Witzel *et al.* 2019; McCarthy *et al.* 2017; Fehér *et al.* 2020; Tuso *et al.* 2013; Mertens *et al.* 2017; (Lea *et al.* 2006; Reipurth *et al.* 2019; Vanhonacker *et al.* 2013). The highest preference of milk by Indian buyers was Almond milk. These findings align with those in the existing studies (Silva *et al.* 2020; Pak 2019). The least preference for plant-based milk alternative for Indian buyers was soy milk. Similar results are achieved by Kundu *et al.* 2018. The overall satisfaction of Indian buyers was satisfied with plant-based milk alternatives.

Level of buyer readiness stage: The average awareness of India's plant-based milk alternative users is high. Knowledge of products is very minimal among consumers but relatively high for the liking stage. The stages of preference and conviction of products are average. Finally, the purchase stage indicates that consumers are happy to purchase plant-based milk alternatives in the market.

Benefits: Plant-based milk alternatives offer financial, environmental, health, convenience, and sensory benefits to the users. Previous studies have demonstrated such benefits (Chalupa-Krebzdak *et al.* 2018; Jeske *et al.* 2017; Corrin, Papadopoulos 2017; McCarthy *et al.* 2017; Lê *et al.* 2013; Steptoe *et al.* 1995; Eertmans *et al.* 2005; Pieniak *et al.* 2009; Konttinen *et al.* 2013). As per these studies, these are the important determinants for plant-based milk alternative buyers. Out of the five determinants, high importance is given to health (Chalupa-Krebzdak *et al.* 2018; Jeske *et al.* 2017; Corrin, Papadopoulos 2017; McCarthy *et al.* 2017; Lê *et al.* 2013; Steptoe *et al.* 1995; Eertmans *et al.* 2005; Pieniak *et al.* 2009; Konttinen *et al.* 2013). At the same time, moderate importance is given to other determinants (financial, environmental, convenience and sensory). Banovic *et al.* 2018; Peschel *et al.* 2019; Aschemann-Witzel *et al.* 2019; McCarthy *et al.* 2017; Janssen *et al.* 2016; Leitzmann 2010; Radnitz *et al.* 2015; Fox, Ward 2008; Kerschke-Risch 2015; Kökény 2005; Lea, Worsley 2002; Lea *et al.* 2006).

Gender differences of buyer readiness stages: Buyer readiness stages contain awareness, knowledge, liking, preference, conviction, and purchase. Firstly, female buyers dominate more

than male buyers in the awareness stage. These results are contrary to those shown in Jacobowitz 2019. Secondly, female buyers had more knowledge than male buyers in India in the knowledge stage. Battalwar, Syed 2017 reported similar findings in their study. Thirdly, female buyers are higher than male buyers in the liking stage. Jacobowitz 2019 reported findings are quite contrary to the study findings. Fourthly, female buyers are more preferred than male buyers in the preference stage. Modlinska *et al.* 2020; Muddeman 2019; Beacom *et al.* 2021 reported the observations are contrary to the previous findings. For the conviction stage, female dominates more than male buyers. There is a lack of evidence showing the gender differences in the conviction stage. Finally, female buyers dominate more than male buyers in the purchase stage. Bryant *et al.* 2019; Hoque, Alam 2018 reported similar findings in their study.

Gender differences in buyer readiness stages are not statistically significant. As a result, Male buyer readiness stages did not differ based on the female buyer readiness stage. The outcome is quite similar to Cong *et al.* 2020

Gender differences in buyer readiness determinants were measured using an independent sample t-test. The results indicate that the determinants (sensory benefits, health, environment, and financial benefits) were high in females, whereas less in males. Similar outcomes were found in previous studies (Kiefer *et al.* 2015; Haas *et al.* 2019; Alae-Carew *et al.* 2021; Nguyen *et al.* 2020; Hartmann, Siegrist 2017; Valgemäe n.d; Beardsworth *et al.* 2020; Michel *et al.* 2021). But the differences of determinants of male and female was not statistically significant.

Buyer readiness for plant-based milk alternatives: Indian buyers and their readiness for them is more than 15.0%. As the buyer readiness for plant-based milk alternatives is low among Indian consumers. So, the study suggests that Indian consumers have less awareness of products available in the Indian market. To increase consumer awareness, the marketer has to portray the message to all people (illiterate, educated, highly educated), focusing on the distinct benefits of purchasing plant-based alternatives to milk products.

The researcher knows that plant-based milk alternatives are available in speciality stores or supermarkets from the survey. There is no availability of drinks in nearby petty shops or other stores. Access to products in these shops can increase the purchase volume, which will result in the consumer demand for plant-based milk alternatives in the Indian market.

Marketers can make an effective advertisement portraying the positive message of consuming plant-based milk alternatives. The advertisement should give importance to the consumer regarding giving benefits to health and the environment.

The state government can review the plant-based milk alternative market, give greater importance to the market, stimulate growth, and keep affordable prices for all segments of Kolkata.

The state government can develop a plant-based market in Kolkata, which exclusively focuses on offering plant-based products to the customers.

CONCLUSION

The study aims to measure consumer readiness to accept plant-based alternatives to dairy products in India. The study addresses the aspects using descriptive research, and it also takes a quantitative approach in increasing the confidence in results. It uses a questionnaire and conducts a web survey. Samples are the users of plant-based alternatives to milk products in Kolkata. Assessment of samples shows the average readiness of plant-based milk alternatives prevailing among Indian consumers. Indian consumers tend to consume plant-based milk extracts occasionally. Most respondents prefer almond milk to other plant-based milk extracts. The preference of milk is based on health determinants, whereas other determinants, financial, environmental, convenience and sensory, is moderate. The overall users are satisfied with the plant-based milk alternatives in India.

The issue of the six-stage of buyer readiness level concerns deeply. Out of six stages, female dominates more than male in five stages (awareness, knowledge, liking, conviction and purchases). Whereas, preferences of buyer is high in male and less in female. But the readiness stages does not differ among male and female respondents. Another issue of determinants of buyer readiness is empirically assessed. The sensory, health, environmental and financial aspects are high in females, whereas less in males. However, convenience determinants are high in males, whereas less in females. But the determinants of buyer readiness is not statistically significant. Thus, the study observes a similar outcome of past studies: females are more prone to plant-based foods than male respondents. But the interesting fact of the study is that male starts preferring the products owing to the product convenience in the market. Also, soy drink is less preferred among consumers in India. Therefore, the study suggests that marketing campaigns are essential for an almond drink to increase awareness and knowledge of products and create a better belief about products, induce consumers to purchase the products and benefit from the drink.

The limitations of the study are that 4.84 million people reside in Kolkata. Out of 4.84 million people, the study uses 110 respondents. Hence, it is not easy to portray the outcome as the reflection of the whole population. Also, the researcher finds it complex to identify the plant-based

alternative to dairy products in Kolkata due to the limited number of users consuming the products. Finding a sample from a vast population is difficult for the researcher.

The study limits its geographical limit to Kolkata, but it could be extended to other cities like Bangalore, Mumbai, Hyderabad, Chennai, and Delhi. More studies are needed to determine buyer readiness for plant-based alternatives to milk products in India. Plant-based alternatives to milk products can be classified based on health and ethical vegetarianism. The buyer readiness stage can pave the existing framework in another research direction. It is anticipated that adding a new classification improves the study significantly.

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APPENDICES

Appendix 1. Questionnaire

Dear respondent, this questionnaire measures buyer readiness towards plant-based alternatives to dairy products. Your response helps to understand consumer behaviour and develop product marketing. It would help if you expressed your own opinion instead of joint positions. Your responses will be used in a generalized form and will not be associated with your person.

Sanjana Tawfique,

Master's degree student,

Tallinn University of Technology

Demographic profile of respondents

1. Age

2. Gender
a. Male
b. Female

3. Education qualification
a. Secondary education
b. Graduates
c. Postgraduate
d. Diploma holders

4. Occupation

5. Annual income

6. Place of residence
a. Rural

b. Urban

c. Semi-urban

7. How often do you consume plant- based alternatives to milk?

a. Very often

b. Sometimes

c. Rarely

d. Never

e. Always

f. Almost always

g. Have not tried

8. Which of the following plant-based alternative to milk do you prefer? (7-Very much to 1-Not at all)

Particular	7	6	5	4	3	2	1	Cannot say
Oats Milk								
Almond Milk								
Rice Milk								
Soy milk								

Level of buyer readiness

9. How much do you agree with the following statements? (7-Strongly agree to 1- Strongly disagree)

Awareness

Statements	7	6	5	4	3	2	1
I always seek information from friends and relatives before making a final choice of a plant-based alternative to milk							
More attention paid to consumer awareness program of plant-based milk products							
Too few consumers read in magazines, newspaper, TV, and social media							
Plant-based alternative to milk products deserve better support from consumers							
Price is the necessary option to choose the plant-based alternative to milk							
When a product is offered at a discount price, I am more tempted to buy it							

I always compare prices of similar products on store							

Knowledge

Statements	7	6	5	4	3	2	1
I consider myself knowledgeable about a plant-based alternative to milk							
I am more familiar with a plant-based alternative to milk than others							
I know the benefits of consuming plant-based alternative to milk							
I know pretty much about the plant-based alternative to milk							

Liking

Statements	7	6	5	4	3	2	1
Appearance							
Aroma							
Flavor							
Texture							
Quality							

Preference

Statements	7	6	5	4	3	2	1
Health							
Daily nutritional needs							
Animal welfare							
Ethical considerations							
Environment concern							

Conviction

Statements	7	6	5	4	3	2	1
I don't hide a consuming plant-based alternative to milk from others							
Plant-based alternative to milk is an essential aspect of my life							
I have no doubts that a plant-based alternative to milk is suitable for me							
I have no doubts that plant-based alternative to milk is suitable for everyone							
I am willing to sacrifice anything to remain a plant-based alternative to milk users							
I encourage others to become the plant-based alternative to milk users							
I consider consuming plant-based alternative to milk when making an essential decision in my life							
I try to carry my plant-based alternative to milk into all my other dealings in life							
I live a life with a plant-based alternative to milk							

Purchase

Statements	7	6	5	4	3	2	1
I am happy to buy plant-based alternative to milk products							
I hope to consume plant-based alternative to milk products							
I would buy a plant- based alternative to milk products							
I plan to consume plant-based alternative to milk products							
I intend to buy a plant- based alternative to milk products in the next few days							

Determinants of buyer readiness of plant-based alternative to milk

10. Which of the following aspects induce you to consume a plant-based alternative to milk?

a. Environment benefits

b. Weight benefits

c. Ethical benefits

d. Health benefits

e. Well-being and contentment

f. Convenience and financial benefits

11. How much do you agree with the following statements? (7-Strongly agree to 1- Strongly disagree)

Statements	7	6	5	4	3	2	1
Plant-based milk saves time and money							
Plant-based milk is having fewer food storage problems							
Plant-based milk tastes good							
Plant-based milk helps to reduce global warming and environmental pollution							
Plant-based milk protect animals as individuals and species							
Plant-based milk increases the food production efficient way							
Plant-based milk helps the environment							
Plant-based milk contains a lot of vitamins and minerals							
Plant-based milk is nutritious							
Plant-based milk is having plenty of energy							
Plant-based milk is readily available in shops and supermarkets							
Plant-based milk smells and looks nice							
Plant-based milk has a pleasant texture							
Plant-based milk tastes good							
Plant-based milk is low in calories and fat							
Plant-based milk assist me in controlling my weight							
Plant-based milk reduces the risk factors for developing chronic diseases							

12. How satisfied are you with plant-based alternative to milk?

a. Very dissatisfied

b. Dissatisfied

c. Neutral

d. Satisfied

e. Very satisfied

13. Which of the plant-based alternative milk do you mostly prefer?

a. Oat's milk

b. Almond milk

c. Rice milk

d. Soy milk

Appendix 2. Result

Table 6. Demographic profile of respondents

Particulars		frequency	percent
Age	18 to 25 years	22	20.0
	26 to 37 years	61	55.5
	38 to 45 years	3	2.7
	46 to 57 years	8	7.3
	Above 57 years	16	14.5
Gender	Male	68	61.8
	Female	42	38.2
Education qualification	Secondary education	13	11.8
	Graduates	37	33.6
	Postgraduates	42	38.2
	Others	18	16.4
Occupation	Students	18	16.4
	Business	15	13.6
	Housewife	13	11.8
	Private employees	24	21.8
	Government employees	40	36.4
Annual income	Euro 500 to Euro 1200	23	20.9
	Euro 1201 to Euro 1800	22	20.0
	Euro 1801 to Euro 2335	20	18.2
	Euro 2336 to Euro 2920	26	23.6
	More than Euro 2921	19	17.3
Place of residence	Rural	45	40.9
	Urban	47	42.7
	Semi-urban	18	16.4
Total		110	100.0

Source: Author's calculation

Table 7. Consumption frequency of plant-based milk alternatives

Particulars		frequency	percent
Consumption frequency of plant-based milk alternatives	Very often	14	12.7
	Sometimes	46	41.8
	Rarely	18	16.4
	Never	11	10.0
	Always	9	8.2
	Almost always	3	2.7
	Have not tried	9	8.2
Total		110	100

Source: Author's calculation

Table 8. Consumer preference for plant-based milk products

Particulars		frequency	percent
Consumer preference for plant-based milk product	Environment benefits	31	28.2
	Weight benefits	14	12.7
	Ethical benefits	7	6.4
	Health benefits	45	40.9
	Wellbeing and contentment	6	5.5
	Convenience and financial benefits	7	6.4
Total		110	100

Source: Author's calculation

Table 9. Satisfaction regarding consuming plant-based milk products

Particulars		frequency	percent
Satisfaction regarding consuming plant-based milk products	Very dissatisfied	4	3.6
	Dissatisfied	5	4.5
	Neutral	36	32.7
	Satisfied	49	44.5
	Very satisfied	16	14.5
Total		110	100

Source: Author's calculation

Table 10. Consumer preference of plant-based alternative to milk

Particulars	mean	standard deviation
Oat's Drink	5.2727	1.90561
Almond Drink	5.5909	1.46704
Rice Drink	5.2364	1.76577
Soy Drink	5.0636	1.78822

Source: Author's calculation

Table 11. Awareness level of buyer readiness

Particulars	mean	standard deviation
I always seek information from friends and relatives before making a final choice of a plant-based alternative to milk	4.9455	1.65256
More attention paid to consumer awareness programs of plant-based milk products	5.1000	1.71314
Too few consumers read in magazines, newspapers, TV, and social media	5.1182	1.73328
Plant-based alternatives to milk products deserve better support from consumers	5.0636	1.64388
Price is the necessary option to choose the plant-based alternative to milk	5.0364	1.77095

When a product is offered at a discount price, I am more tempted to buy it	5.1364	1.71061
I always compare prices of similar products on store	5.0818	1.83809

Source: Author's calculation

Table 12. Knowledge level of buyer readiness

Particulars	mean	standard deviation
I consider myself knowledgeable about a plant-based alternative to milk	5.2636	1.67922
I am more familiar with a plant-based alternative to milk than others	4.8091	1.82990
I know the benefits of consuming plant-based alternatives to milk	5.0273	1.82972
I know pretty much about the plant-based alternative to milk	4.9000	1.85210

Source: Author's calculation

Table 13. Liking level of buyer readiness

Particulars	mean	standard deviation
Appearance	5.6091	1.37538
Aroma	5.3727	1.45173
Flavour	5.3364	1.47317
Texture	5.1636	1.53568
Quality	5.5545	1.58309

Source: Author's calculation

Table 14. Preference level of buyer readiness

Particulars	Mean	standard deviation
Health	5.9364	1.41601
Daily nutritional needs	5.7000	1.33787
Animal welfare	5.4909	1.64091
Ethical considerations	5.6000	1.60389
Environment concern	5.6545	1.62795

Source: Author's calculation

Table 15. Conviction level of buyer readiness

Particulars	mean	standard deviation
I don't hide a consuming plant-based alternative to milk from others	5.1455	1.76529
Plant-based alternative to milk is an essential aspect of my life	4.9000	1.89616

I have no doubts that a plant-based alternative to milk is suitable for me	5.1273	1.88723
I have no doubts that plant-based alternative to milk is suitable for everyone	4.7909	1.74574
I am willing to sacrifice anything to remain a plant-based alternative to milk users	4.7545	1.86806
I encourage others to become the plant-based alternative to milk users	4.9182	1.85795
I consider consuming plant-based alternatives to milk when making an essential decision in my life	4.9273	1.82092
I try to carry my plant-based alternative to milk into all my other dealings in life	4.8909	1.88351
I live a life with a plant-based alternative to milk	4.7273	1.92000

Source: Author's calculation

Table 16. Purchase level of buyer readiness

Particulars	mean	standard deviation
I am happy to buy plant-based alternatives to milk products	5.3818	1.61973
I hope to consume plant-based alternatives to milk products	5.0909	1.74811
I would buy a plant-based alternative to milk products	5.0273	1.74240
I plan to consume plant-based alternatives to milk products	4.9455	1.71788
I intend to buy a plant-based alternative to milk products in the next few days	5.0273	1.77887

Source: Author's calculation

Table 17. Financial benefits of buyer readiness of plant-based alternative to milk

Particulars	mean	standard deviation
Plant-based milk saves time and money	5.1545	1.71441
Plant-based milk has fewer food storage problems	5.1182	1.64641
Plant-based milk tastes good	5.0000	1.64791

Source: Author's calculation

Table 18. Environment benefits of buyer readiness of plant-based alternative to milk

Particulars	mean	standard deviation
Plant-based milk helps to reduce global warming and environmental pollution	5.0909	1.79982
Plant-based milk protect animals as individuals and species	5.1182	1.70661
Plant-based milk increases the food production efficient way	4.9273	1.66843
Plant-based milk helps the environment	5.0455	1.68853

Source: Author's calculation

Table 19. Health benefits of buyer readiness of plant-based alternative to milk

Particulars	mean	standard deviation
Plant-based milk contains a lot of vitamins and minerals	5.1364	1.64499
Plant-based milk is nutritious	5.3000	1.71100
Plant-based milk has plenty of energy	5.1182	1.66855

Source: Author's calculation

Table 20. Convenience of buyer readiness of plant-based alternative to milk

Particulars	Mean	standard deviation
Plant-based milk is readily available in shops and supermarkets	4.8818	1.68497
Plant-based milk smells and looks nice	5.1455	1.65810
Plant-based milk has a pleasant texture	5.0636	1.62140

Source: Author's calculation

Table 21. Sensory of buyer readiness of plant-based alternative to milk

Particulars	mean	standard deviation
Plant-based milk tastes good	5.0182	1.63663
Plant-based milk is low in calories and fat	5.0000	1.65900
Plant-based milk assist me in controlling my weight	4.9545	1.82433
Plant-based milk reduces the risk factors for developing chronic diseases	5.0636	1.69877

Source: Author's calculation

Table 22. Consumers' preference for various plant-based milk alternatives

Particulars		frequency	percent
Various types of plant-based alternatives to milk	Oat's Drink	18	16.4
	Almond Drink	43	39.1
	Rice Drink	32	29.1
	Soy Drink	17	15.5
Total		110	100

Source: Author calculation

Table 23. Reliability

Cronbach's Alpha	N of Items
.985	56

Source: Author's calculation

Table 24. Communalities

Particulars	Extraction
Awareness1	.772
Awareness2	.744
Awareness3	.670
Awareness4	.819
Awareness5	.685
Awareness6	.783
Awareness7	.729
Knowledge1	.779
Knowledge2	.807
Knowledge3	.740
Knowledge4	.835
Liking1	.673
Liking2	.648
Liking3	.696
Liking4	.654
Liking5	.723
Preference1	.817
Preference2	.793
Preference3	.675
Preference4	.744
Preference5	.743
Conviction1	.790
Conviction2	.757
Conviction3	.801
Conviction4	.743
Conviction5	.773
Conviction6	.849
Conviction7	.833
Conviction8	.873
Conviction9	.852
Purchase1	.793
Purchase2	.799
Purchase3	.795
Purchase4	.773
Purchase5	.733

Source: Author's calculation

Table 25. Total Variance Explained

Component	Initial Eigenvalues	Rotation Sums of Squared Loadings

	total	% of variance	cumulative %	Total	% of variance	cumulative %
1	21.331	60.945	60.945	9.953	28.436	28.436
2	2.388	6.823	67.768	6.324	18.069	46.506
3	1.674	4.783	72.551	6.240	17.828	64.334
4	1.302	3.719	76.270	4.178	11.936	76.270
5	.952	2.720	78.990			
6	.799	2.284	81.274			
7	.705	2.013	83.287			
8	.575	1.642	84.929			
9	.481	1.375	86.304			
10	.444	1.269	87.573			
11	.426	1.216	88.789			
12	.384	1.096	89.885			
13	.365	1.042	90.926			
14	.303	.865	91.792			
15	.300	.856	92.648			
16	.274	.782	93.430			
17	.254	.725	94.156			
18	.244	.698	94.853			
19	.207	.590	95.444			
20	.194	.554	95.998			
21	.172	.492	96.491			
22	.154	.441	96.932			
23	.144	.411	97.342			
24	.132	.377	97.719			
25	.122	.348	98.067			
26	.107	.305	98.373			
27	.095	.272	98.645			
28	.081	.230	98.875			
29	.071	.203	99.078			
30	.067	.192	99.271			
31	.059	.170	99.441			
32	.056	.159	99.599			
33	.052	.148	99.747			
34	.048	.136	99.883			
35	.041	.117	100.000			

Source: Author's calculation

Table 26. Rotated Component Matrix

Particulars	Component			
	1	2	3	4
Awareness1			.768	
Awareness2			.727	
Awareness3			.704	
Awareness4			.767	

Particulars				
Awareness5				.647	
Awareness6				.740	
Awareness7				.725	
Knowledge1					.623
Knowledge2					.755
Knowledge3					.567
Knowledge4					.726
Liking1			.524		
Liking2			.514		
Liking3			.532		
Liking4			.527		
Liking5			.677		
Preference1			.738		
Preference2			.757		
Preference3			.744		
Preference4			.764		
Preference5			.775		
Conviction1	.659				
Conviction2	.782				
Conviction3	.724				
Conviction4	.722				
Conviction5	.762				
Conviction6	.847				
Conviction7	.820				
Conviction8	.805				
Conviction9	.781				
Purchase1	.630				
Purchase2	.741				
Purchase3	.752				
Purchase4	.729				
Purchase5	.665				

Source: Author's calculation

Table 27. Communalities

Particulars	Extraction
Financial benefits1	.674
Financial benefits2	.719
Financial benefits3	.720
Environment benefits1	.654
Environment benefits2	.803
Environment benefits3	.717
Environment benefits4	.794

Health benefits1	.835
Health benefits2	.769
Health benefits3	.816
Convenience1	.774
Convenience2	.869
Convenience3	.836
Sensory1	.829
Sensory2	.853
Sensory3	.806
Sensory4	.796

Source: Author's calculation

Table 28. Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	total	% of variance	cumulative %	Total	% of variance	cumulative %
1	11.998	7.468	7.468	7.468	70.574	70.574
2	1.266	5.796	5.796	5.796	7.450	78.024
3	.716	4.213	82.237			
4	.527	3.099	85.336			
5	.416	2.445	87.781			
6	.328	1.930	89.712			
7	.292	1.719	91.430			
8	.248	1.459	92.889			
9	.227	1.337	94.226			
10	.200	1.177	95.403			
11	.180	1.059	96.462			
12	.147	.864	97.326			
13	.121	.714	98.040			
14	.105	.615	98.655			
15	.088	.519	99.175			
16	.076	.445	99.620			
17	.065	.380	100.000			

Source: Author's calculation

Table 29. Rotated Component Matrix

Particulars	Component	
	1	2
Financial benefits1		.770
Financial benefits2		.802
Financial benefits3		.795
Environment benefits1		.728
Environment benefits2		.726
Environment benefits3		.696
Environment benefits4		.739

Health benefits1	.779	
Health benefits2	.707	
Health benefits3	.777	
Convenience1	.797	
Convenience2	.802	
Convenience3	.759	
Sensory1	.768	
Sensory2	.844	
Sensory3	.864	
Sensory4	.855	

Source: Author's calculation

Table 30. Buyer readiness of plant-based milk alternatives

Particulars	Plant-based milk alternatives	
	Mean	percent
Awareness	5.641	18.10
Knowledge	5.427	17.4
Liking	5.249	16.8
Preference	5.061	16.2
Conviction	4.943	15.9
Purchase	4.834	15.5

Source: Author's calculation based on the opinion of plant-based milk alternative buyers

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