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Understand Portuguese Plant-based Milk Alternatives Consumers Perceptions on Private-label and A-label Brands

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Abstract

The Portuguese consumption of PBMA has been increasing, even though Portugal is known for its conservative environment with a rich culture in dairy consumption. To capture consumers, it is necessary to comprehend how they perceive PBMA private-label and A-label products, their preferences, how demographics impact it, their motivations, and hesitations in PBMA consumption. To better benefit from it, segmentations need to be created. Information conducted through surveys made it possible to conduct a Perceptual Map and a Conjoint Analysis. The main findings are used in recommendations for the studied brands to improve their market presence and competitive advantage.

Keywords: Market Research, Perceptual Map, Conjoint Analysis, Private-label, Plant-based Milk Alternatives

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1. Introduction

In recent years, the food retail industry has seen an increase in demand for Plant-Based Milk Alternatives, an emerging market segment that is constantly evolving and expanding, with new and innovative products that have captivated consumers over time. The term "Plant-Based" is "used to describe a recent consumer trend of avoiding animal-based products and choosing plant-based alternatives instead" (Aschemann-Witzel et al., 2020). In particular, Plant-Based Milk Alternatives, otherwise known as PBMA have been described as "liquids extracted by crushing plant material in water and designed by homogenization to be quite similar to cow's milk in appearance, mouthfeel, taste, and shelf life so that they can be used for similar applications" (Pointke et al., 2022). For the sake of simplicity, PBMA is an acronym that will be used along the following study when referring to these beverages. This subcategory is part of the non-dairy milk market and has a wide variety of options, ranging from soy milk to almond, coconut, oat, rice, and many other varieties of plant-based beverages.

As a matter of fact, "the consumption of PBMA has increased in Europe from 2018 to 2020" (Pointke et al., 2022). More than that, in Portugal, revenue from the milk market is expected to grow by 3.01% annually (CAGR 2023-2027) (*Milk - Portugal | Statista Market Forecast*, 2023), in comparison to the market for milk substitutes, which is expected to grow by 12.24% annually (CAGR 2023-2027) (Milk Substitutes - Portugal | Statista Market Forecast, 2023), which highlights the contrast between both markets and points towards an increase in milk substitutes' consumption. In addition, a 2023 study regarding breakfast habits in Portugal stated that 15.3% of the Portuguese population consumes PBMA for breakfast (Borges, 2023), once again confirming that "plant-based food and proteins are a recent, growing trend" (Aschemann-Witzel et al., 2020).

It is clear that the plant-based movement has been on the rise, given that in 2020, the European Commission published the Farm to Fork Strategy (FFK), a plan with the intent of promoting a European shift towards plant-based diets (European Commission). Firstly driven by Millennials and Generation Z, it is now popular among all age groups (The Rise and Rise of Plant-Based Milks | News, 2021). Indeed, there are many reasons to opt for a plant-based diet, some of which being health, personal taste, animal welfare, environmental concern, or weight loss (Miki et al., 2020). Even the pandemic has been considered a catalyst for the adoption of these types of beverages, making these dietary choices more appealing (Smolokoff, 2021).

Overall, health has been an element of study for years and wellness is a topic that has been more openly explored and talked about over time, thus it is vital to study methods and products (such as PBMA) that can have a positive impact on health and contribute to individual wellbeing, since "wellness is a concept at the forefront of health promotion" (D. Oliver et al., 2018).

In this sense, the fundamental goal of this study is to use marketing research as a way to gain a better understanding of consumer-behaviour regarding PBMA in the Portuguese market. Since PBMA is considered the focus product, the research question emerges as:

"Plant-Based Milk Alternatives: Perceptions and Preferences of Portuguese Consumers"

Considering the research question stated above, the researchers defined four main objectives:

(1) Understand consumer perceptions of private-label offerings as well as of top market players.
(2) Identify which attributes are more important for consumers in PBMA and what their preferences are.
(3) Understand how demographics influence consumer motivations to drink PBMA, and which considerations are responsible for discouraging non-consumers.

(4) Which consumer segments can be identified and what are their preferences and motivations? How do both differ across segments?

Hence, the aim of this work project is to answer the previously defined questions in the most accurate manner possible. The particular focus on the Portuguese market is justified by the decrease in consumption of dairy milk while the PBMA market keeps growing steadily. Nonetheless, one should note that Portugal is a country in which the dairy market has a strong presence, posing a barrier to the adoption of PBMA. For this purpose, the researchers started with a background contextualization on PBMA, in which relevant statistics and trends were covered as well as existing brands available in the Portuguese market. Subsequently, there was an extensive search process for the elaboration of the literature review. This section was divided into two parts: in the first part, the aim was to gain a better understanding of consumer behaviour and purchase decisions as a whole and how it can be influenced by the brand image on health and sustainable products. In the second part, research focused on the behaviour and purchasing decisions of PBMA consumers, allowing for more insights into their motivations and preferences, and also differentiating between European and Non-European consumers. Additionally, preliminary research was conducted through interviews with industry professionals and consumers. This information was essential to keep ahead of the work and get some crucial insight for the elaboration of the: 1) Perceptual Map, to visually analyse how Portuguese consumers perceive PBMA and 2) Conjoint Analysis, to better grasp how these consumers value different components or features of said products. Further research was conducted through an experiment that allowed to compare the brands that stood out in previous results. Subsequently, the researchers discussed the results of the experiments and established a comparison with the findings from the literature review. By the end, it was possible to extract important conclusions that answer the research question and its objectives, as well as insights for future research and managerial recommendations. In sum, the results of the analysis showed

that private-label offerings are perceived as less transparent, biological, savoury, eco-friendly, trendy, and also with lower quality but not as more or less healthy nor having a shorter or wider variety of offer. In contrast, A-label brands are perceived more positively for the perceptions mentioned above. For non-consumers of PBMA, the main reasons for non-consumption revolve around preference for cow milk, dislike for the taste of PBMA, or non-consumption of milk at all. There was also evidence regarding demographics, showing that younger age groups, as well as more females than males have a bigger tendency for the consumption of PBMA. Also, four motivations for consumption of PBMA were analysed, with flavour preference being the most influential and ethical reasons being the least. Additionally, brand, added aroma and price are the most important attributes for Portuguese consumers, with most of them favouring the brand Alpro (the private-label alternative is Continente) preferring no added aroma and lower prices, but willing to pay higher prices if the brand is Alpro and/or has no added aroma. However, there has been a shift in the PBMA market in Portugal since the results show a changing preference of consumers for the Continente private-label.

2. Behaviour of plant-based consumers

2.1. Motivations and preferences on plant-based products' consumption

"The main challenges of milk alternatives are to provide a desirable and acceptable sensory experience for consumers and to match the nutritional value of milk" (Alcorta et al., 2021). Sensory science is a field that applies various methods for measuring and analysing the response to food through the senses (Lawless & Heymann, 2010). The research seeks to contribute to sustainable food production and development through a better understanding of the current market situation. This is an important topic as sensory properties hold a crucial role in the consumption of plant-based products (Vaikma et al., 2021), like so, improvements in sensory quality must be made. Hence, it is relevant and a need for brands to work on the principal

sensory features of the PB products to resemble as much as the product it's substituting. The higher the resemblance, the higher the likelihood that people will try it and embrace it. "Since the sensory properties play a crucial role in the consumption of plant-based beverages, undesirable off-flavours should be reduced". A beany taste in soy-based products, a high level of bitterness, and poor textural quality, for instance because of a high starch content, are examples of off flavours that are frequently mentioned (Pointke et al., 2022).

Soy milk is the most popular plant-based substitute for cow's milk; it was created in Asia in the 1940s and promoted in the United States and Europe in the 1970s and 1980s. Additionally, as an explanation on why soy PBMA has the largest market share on this market, is because soy drinks came closest to cow's milk in macro- and micronutrients (Cardello et al., 2022).

Additionally, it is important to emphasize that times are changing. So are the consumers and the plant-based products market. Ergo, what is known to be true now, might change as the years go by. Taking the PMBA beverages consumers can also determine, as they become accustomed to the new flavours and textures these drinks offer, the less resemblance to cow milk, the better. Consequently, the motivations and preferences of consumers are very relative and personal, making it harder to draw a concrete conclusion, leading to a persona with certain motivations and a number of preferences, for example. These are very volatile, and so is this market with constant new offerings and innovations.

"Increasing awareness for sustainability and health tremendously impacts consumers' behaviour in food choice in Europe (Moller et al. 2019). With steadily growing trends and demands for plant-based alternatives, the consumption of dairy milk has become less attractive and decreased over the last years (Sethi, Tyagi, & Anurag, 2016; Cargill, 2018)". As a result, plant-based milk substitutes like oat milk are becoming more popular overall, which gives them a high level of relevance in the food market. Customers believe that plant-based milk is healthier

and better suited to their lifestyles. Beyond the trend of substituting animal goods, plant-based milk offers major convenience benefits for consumers who suffer from various milk allergies, such as lactose intolerance, or from frequent digestive issues when drinking dairy milk (Schneider et al., 2021). Consequently, for this research, we considered the following motivations as the main drivers for PB beverage consumers 1) healthier or more nutritious choices, 2) health issues, 3) ethical reasons (sustainability concerns or animal welfare), and 4) flavour preference:

(1) **Healthier or more nutritious choices:** A Swiss study that examined the nutritional content of 45 plant milk products from the major supermarket chains found that switching from cow milk to plant milk results in lower intakes of calcium, proteins, minerals, some vitamins, and an increase in salt intake (Haas et al., 2019). However, most plant-based milk contains 37% to 75% less fat per cup than one cup of whole-fat cow's milk (UCLAHEALTH, 2022), but this does not mean there is not a nutritional deficiency in PB beverages. Moreover, PBMA brands are aware of this lack of nutrients that cow milk offers, and such improvements have been made since day one, to respond to all consumers' needs, by being fortified with vitamins, minerals, and other functional ingredients. Therefore, there is a demand for more plant-based goods with protein levels that are comparable to those of cow's milk (Vogelsang-O'Dwyer et al., 2021). In the meantime, the scientific community is researching novel processing techniques that can raise the nutritional content, bioavailability of food components, and sensory acceptability of plant-based beverages (Angelino et al., 2020).

(2) **Health Issues:** "A comprehensive review by Sethi et al. highlighted that this trend can be due to several different reasons, mostly related to health and nutrition concerns, that lead to a shift towards a plant-based diet". Among them, those with lactose intolerance frequently consume plant-based beverages; the frequency of this condition ranges from 28% in Europe

to 64%-70% in the Middle East and Asia (Angelino et al., 2020). Furthermore, in order to achieve the goal of consuming fewer animal products, more plant-based beverages have been recommended for persons who have hypercholesterolemia or are suffering from cardiac diseases. For example, PB drinks that are free of animal fats (Angelino et al., 2020).

(3) **Ethical Reasons (sustainability concerns or animal welfare):** Cow milk is being examined more closely because of its effects on the environment and moral concerns about animal welfare (Haas et al., 2019). Cow's milk greatly outperforms the plant-based alternatives in every metric. It may be better for the environment if more consumers switch from cow milk to plant milk (Haas et al., 2019). However, as previously exposed, not all plant milk substitutes are sustainable, taking the case of almond plantations and their negative impact on the environment.

(4) **Flavour preference:** "At the ingredient level, Vaikma, et al. (2021) found that the primary flavour attribute of plant-based drinks was associated with its specific plant source." (Cardello et a.., 2022). Oat, rice, buckwheat, and quinoa products were discovered to have a cereal flavour, whereas almond, coconut, hazelnut, cashew, and Brazil nut products were discovered to have nutty flavours. Specific products were noted as having different tastes, smells, and textures within these categories. Oat-based milk substitutes had the highest levels of bitterness and aftertaste, followed by buckwheat and quinoa. Rice products stood out for having an astringent flavour and hay-like aroma. Almond, cashew, and Brazil nut milk products often had a thicker consistency and a salty flavour. On the other hand, soy-based goods were discovered to have a reddish hue, hay-like and earthy odours, and metallic and astringent tastes (Vaikma, et al., 2021) (Cardello et al., 2022). "Together, the flavours associated with plant origins and other non-dairy flavours are problematic, because the less that a milk alternative tastes like dairy milk, the lower is its acceptance (Diarra et al., 2005,

Sakthi et al., 2020, Oduro et al., 2021)" (Cardello et a.., 2022). There is flavour preference which then leads to a wide variety of offer.

2.2. Plant-based products European consumers

"In Europe, plant milk is on the way to leave its niche position. An estimated 15% of Europeans does not consume dairy anymore, resulting in a plant milk market share of 4% in Europe". However, sales more than doubled in the last ten years, particularly for non-soy beverages, which increased their market share in the plant milk category from 17% to 40% (Haas et al., 2019). For instance, 26% of homes in Austria utilize plant milk on occasion or more frequently. More than 130 plant milk substitutes with a market value of $1.5 billion were offered on the European market in 2015. Comparatively, the European dairy processing industry's revenue in 2004 totalled US $138 billion (Haas et al., 2019).

"The plant-based milk market in Germany is expected to surge rapidly in the next ten years. By 2033, the market is projected to showcase a CAFR of 10.9%." The plant-based milk industry is anticipated to expand as millennials in the country become more aware of their health and environmental impact. Future Market Insights predicts that the Europe market will grow at a rate of about 11.7% between 2023 and 2033 (Choudhury, 2023).

Plant-based products are expanding quickly, in part because they are becoming more and more well-liked outside of the vegan community. According to a pre-pandemic poll, 45% of European consumers follow "flexitarian" diets that include both dairy and plant-based dairy alternatives. Only 4% of respondents stated they only eat dairy substitutes (*Global Snapshot: Plant-Based Dairy Alternatives Have a Permanent Place in Grocery Stores*, 2022). Due to the rising availability and popularity of plant-based dairy replacements, more now than ever consumers are purchasing and tasting them.

“Consumers like to pick and choose what suits them”. Customers who consume dairy milk but not dairy cheese may want to purchase almond milk in addition to dairy cheese on a weekly basis if they experience symptoms of lactose intolerance when consuming dairy milk. Alternatives to dairy products may be preferred by certain customers because they believe them to be healthier and more environmentally friendly than animal byproducts. (*Global Snapshot: Plant-Based Dairy Alternatives Have a Permanent Place in Grocery Stores*, 2022).

2.3. Plant-based products Portuguese consumers

Milk consumption has been sharply declining, a trend that is evident across Europe, but is particularly evident in Portugal, where consumption has fallen 17% per capita since 2016. The Directorate General of Health continues to recommend daily consumption and prioritizing milk as a food in a healthy and balanced diet, but in 2015 the average amount of milk consumed in Portugal per person was 71 kilograms, the lowest amount in the previous 32 years (Balça Osório, 2018).

A survey with a sample made of 2000 Portuguese consumers, clearly demonstrates that plant-based diets are a rapidly expanding trend in Portugal and that the vegan lifestyle is growing in popularity among the country's youthful population, according to the Portuguese Vegetarian Association. This way of living has been further supported by the law that the Portuguese parliament approved in April 2019 mandating that all public canteens serve vegan food. “Environmental and animal welfare concerns are considered to be two of the main drivers behind this trend, as well as the health benefits of a vegetarian lifestyle.” (*Number of Vegetarians in Portugal Rises by 400 Percent in 10 Years*, 2019).

According to Pires et al. (2021) findings, with 886 valid responses, people preferred almond vegetable drink over oat and soy beverages. Additionally, the responses demonstrated a

favourable perception of the consumption of PB beverages in general (48.2% of women and 45.1% of men had favourable perceptions). Regarding the perceptions, there were no statistically significant variations in the responses from men and women. However, according to age and professional field (health, nutrition, or agriculture), the Portuguese population demonstrated a lack of knowledge about some aspects of plant-beverage production, health advantages, or nutritional values (Pires et al., 2021). Almond milk began to gain popularity in coffee shops and supermarkets in the early 2010s, with its late introduction in these channels. Hence, soymilk consumption began to progressively fall as almond milk gained popularity (Devoney, 2022). Nevertheless, soy milk was the "market leader" in the PBMA market because it was the pioneer with its presence in coffee shops and supermarkets and its taste resemblance to cow milk, which was a big motivator for consumers who expected a similar taste and texture when making this change on their lifestyle. Until now, where preferences of consumers are changing and access to information is greater than ever. "Some of our consumers are cautious about drinking soy milk, mostly because of claims that consuming genetically modified soy products can increase the number of soy isoflavones in your diet" (Devoney, 2022).

As for (Graça et al., 2019), a study with a sample formed by 1600 Portuguese allowed for the identification of trends and variations across three sets of variables, "(a) current eating habits (i.e., meat, fish, and plant-based meals), (b) consumer willingness to change (i.e., reduce meat consumption, follow a plant-based diet, maintain the status quo), and (c) enablers for eating plant-based meals more often (i.e., capability, opportunity, motivation)", thinking about consumer attitudes about general and food consumption in particular.

Another study conducted on 1040 Portuguese consumers, representative of the Portuguese population, made it possible to evaluate probable driving forces behind dietary decisions, enabling the provision of guidance for policy choice. The questionnaire's probable motivators

are provided in four groups, "(1) the socioeconomic characteristics; (2) general food consumption orientations; (3) specific food consumption orientations and concerns; and (4) food consumption preferences and behaviours" (Pais et al., 2023). The current findings imply that consumers who actively seek information before making food decisions—that is, consumers who have ingrained the habit of staying updated and engage in behaviours that maintain that level of knowledge about food—follow healthier and more sustainable diets. "One of the main findings suggest that not only is promoting clear and accessible information important but guaranteeing that consumers actively seek out information and know how to use it should be the focus of food policies." (Pais et al., 2023).

2.4. Plant-based products non-European consumers

Given that the global PBMA has already been addressed, our aim for this topic is to emphasize distinct factors that prompt the global populace to consume PB beverages. Although plant-based dairy products are often associated with well-known American brands, the trend is popular all around the world. Taking the curious example of India. The PBMA market in India is expected to grow at a CAGR of 6.2%. The demand for PB milk products is increasing since consumers are becoming more and more aware of what a healthier lifestyle and better eating habits look like. As it was previously mentioned, the nutrients and the constant innovation that this market seeks in order to become the best replacement for cow milk is an ongoing process that still needs some adjustments because what one option lacks, the other one has in abundance (Choudhury, 2023).

"US market data from the retail sales research company Nielsen shows that cow milk's sales have declined in the USA by 6% in 2017. Over the course of decades, the decline of cow milk sales in the USA was even more dramatic." US's consumption of liquid cow milk decreased by 5.1% from 2000 to 2004. However, from 2010 to 2014, it fell by 10.2%. Sales of plant milk, on

the other hand, are up 9% over the prior year. Soy milk was initially substituted for cow milk by US consumers, but other plant-based milk replacements have grown in favour recently. (Haas et al., 2019). According to (Adams et al., 2022), dairy is a major part of the American diet, where 84 percent of consumers in the US eat and drink dairy or dairy substitutes, and only 16 percent do not. These consumer categories are exhibiting changes in their consumption of dairy and alternatives as new plant-based dairy substitutes hit the market and costs change, supported by demographic traits and beliefs. Concurring the same research, the sales of plant-based substitutes are more affected by rising prices than the sales of dairy goods, which can be explained by various reasons such as, even in a context of inflation, consumers of dairy products are less likely to change their dairy purchases. These results are consistent with the relatively inelastic nature of dairy products (Adams et al., 2022). Moreover, dairy and substitute consumption is mainly driven by taste and health for US consumers. Dairy and plant-based substitute consumption is influenced by personal taste preferences and perceived health advantages. Both taste and health are important to consumers of PBMA, although health is the main driver for 42% of them, with taste coming in at 36% (based on responses from 1,217 consumers surveyed in August 2022) (Adams et al., 2022).

3. Perceptual Map

3.1. Analysis and Results

3.1.1. Sample analysis

At the begging of the survey, consumers were asked if they had been living in Portugal throughout the last five years and if they were over 18 years old, making this a criterion to participate in the conducted study. Out of a total of 327 responses, 291 fulfilled this requirement (89%). When asked about being a consumer of PBMA, 175 answered yes (60.1%), while 116

answered no (39.9%). With those responses, it is possible to segment two groups, the consumers, and the non-consumers of PBMA.

3.1.2. Demographics

To better study what can influence consumers' perceptions regarding PBMA, the demographics of consumers and non-consumers will be studied. As so, the sample will be characterized using the variables gender, age, education, employment situation, and household income.

Gender

The consumer sample contains 150 females (85.7%), 23 males (13.1%), and 2 people who preferred not to answer (1.1%) (Appendix - figure 12). Hence, the sample is mostly composed by females. From the non-consumer sample, with 116 responses, 2 people preferred not to answer, 60 were female (51.7%), and 54 were male (46.6%) (Appendix - figure 13).

These results may be justified by the fact that, as previously mentioned, women are more inclined to adopt a vegetarian diet than males, who frequently take PBMA more readily (Giacalone et al., 2022) and, following the Journal of the American College of Nutrition, tend to experience gastrointestinal symptoms and nausea after ingestion cow milk more often than men (Vesa et al., 2000).

Age

The consumer sample contains 130 individuals with an age range of [18-24] years old (74.3%), 26 individuals with an age range of [25-34] years old (14.9%), 5 individuals with an age range of [35-44] years old (2.9%), 10 individuals with an age range of [45-54] years old (5.7%), 2 individuals with an age range of [55-64] years old (1.1%) and 2 individuals with 65 or more years old (1.1%) (Appendix - figure 14). Hence, one can conclude that the consumers' sample

distribution is skewed to the young adults group. The non-consumer sample contains 71 individuals with an age range of [18-24] years old (61.2%), 14 individuals with an age range of [25-34] years old (12.1%), 14 individuals with an age range of [35-44] years old (12.1%), 5 individuals with an age range of [45-54] years old (4.3%), 12 individuals with an age range of [55-64] years old (10.3%) and no individuals with 65 or more years old. Thus, it is possible to conclude the non-consumers' sample distribution is skewed to the young adult group, however, when compared to the consumer's sample, older respondents are in higher numbers here, reflecting a higher standard deviation (Appendix - figure 15).

This difference in sample results can be explained by a study done in the United States, which reported that the Millennial and Z generations are more prospective to be aware of environmental sustainability as a food value (Martínez-Padilla et al., 2023).

Education Level

The consumer sample contains 13 individuals that have up to high school level (7.4%), 90 individuals hold a bachelor's degree (51.4%), 70 hold a master's degree (40%), 1 an MBA (0.6%) and 1 a Ph.D. (0.6%) (Appendix - figure 16). As a result, most of the consumers' sample is composed of individuals with the highest level of education being a bachelor's or a master' degree. The non-consumer sample contains 11 individuals that have up to high school level (9.5%), 34 individuals hold a bachelor's degree (29.5%), 68 hold a master's degree (58.6%), 2 an MBA (1.7%) and 1 a Ph.D. (0.9%) (Appendix - figure 17). As so, most of the non-consumers' sample is composed of individuals with the highest degree of education being a master's degree. In this case, the education level of the non-consumers respondents is higher than in the consumer sample and the results are a bit more dispersed.

These results contradict a study published in 2017 which found that young adults in Sweden that have a university degree were more likely to consume PBMA compared to those with only high school education level (Martínez-González et al., 2017).

Employment situation

The consumer sample contains 4 unemployed individuals (2.3%), 63 students (36.0%), 25 working students (14.3%), 74 employed (42.3%), 7 self-employed (4%), and 2 retired (1.1%) (Appendix - figure 18). Hence, most of the consumers are either students or employed. The non-consumer sample contains 5 unemployed individuals (4.3%), 41 students (35.3%), 15 working students (12.9%), 47 employed (40.5%), 7 self-employed (6%), and 1 retired (0.9%) (Appendix - figure 19). Thus, like the consumers' sample, most of the non-consumers responders are either students or employed and no conclusions can be taken about the influence of the employment situation on PBMA consumption.

Household income

From the consumer sample, 29 individuals preferred not to answer this question (16.6%). 20 individuals have a household income of less or equal to 750 Eur (11.4%), 48 between 751 and 1500 Eur (27.4%), 37 between 1501 and 2500 Eur (21.1%), 17 between 2501 and 3500 Eur (13.7%), and 24 more than 3500 Eur (13.7%) (Appendix - figure 20). Consequently, most of the consumers have a household income between 750 to 2500 Eur. From the non-consumer sample, 22 individuals preferred not to answer this question (19%), 13 individuals have a household income of less or equal to 750 Eur (11.2%), 19 between 751 and 1500 Eur (16.4%), 23 between 1501 and 2500 Eur (19.8%), 19 between 2501 and 3500 Eur (16.4%), and 20 more than 3500 Eur (17.2%) (Appendix - figure 21). Therefore, the non-consumers' household income is more or less evenly distributed.

3.1.3. Dairy consumption of PBMA consumers

Of the PBMA consumers, 65 consume dairy products (37.1%) and 110 do not (62.9%) (Appendix - figure 22). Consequently, most PBMA consumers do not consume dairy products, confirming previous findings that state that "With steadily growing trends and demands for plant-based alternatives, the consumption of dairy milk has become less attractive and decreased over the last years" (Sethi, Tyagi, & Anurag, 2016; Cargill, 2018). That can be justified by the fact that the increase in the consumption of dairy alternatives is mostly motivated by the rising cases of lactose intolerance, milk allergies, environmental concerns, and issues related to diets high in cholesterol and ethical reasons, hence its consumption becoming a lifestyle instrument (Haas et al., 2019), earlier mentioned.

3.1.4. PBMA non-consumers' barriers

After asked about their PBMA consumption habits, non-consumers were enquired about their reasons why not to consume PBMA. From this full group, two responses were considered invalid, 32 justify not consuming PBMA because they prefer cow milk (28.07%), 30 do not like the taste of PBMA (26.32%), 21 do not consume milk in general (18.42%), 13 have no interest in trying (11.40%), 8 find it too expensive (7.02%), 7 find cow milk more nutritional (6.14%), and 3 justify still living with their families and following their habits (2.63%) (Appendix - table 7).

More than 50% of respondents reply saying that either they prefer cow milk to plant-based alternatives, they do not like the taste of PBMA, or they follow their family traditions. All barriers are related to the lack of product familiarity. The flavours associated with plant origins and other non-dairy flavours can be problematic, because the less that a milk alternative tastes like dairy milk, the lower its acceptance (Diarra et al., 2005, Sakthi et al., 2020, Oduro et al.,

2021) and the more a milk substitute resembles dairy milk, the higher the likelihood that people will accept it (Giacalone et al., 2022).

Some non-consumers of PBMA have no interest in trying alternatives, supporting the research about the Portuguese population and how they demonstrated a lack of knowledge about some aspects of plant-beverage production, health advantages, or nutritional values (Pires et al., 2021). Aligned with that, some respondents justified not consuming PBMA because they find cow milk more nutritious. However, moreover, PBMA brands are aware of this lack of nutrients and improvements have been made since day one by being fortified with vitamins, minerals, and other functional ingredients (Vogelsang-O'Dwyer et al., 2021).

3.2. Multidimensional Perceptual Map Analysis

As mentioned before, prior to evaluating the perception of each brand, PBMA consumers were asked if they had tried the brand in the past. Only after that, if consumers answered "yes" respondents were asked to assign levels for each attribute. As a result, out of the 175 individuals, 173 have before tried Alpro (98.9%), 74 have tried Shoyce (42.3%), 70 have tried Rude Health (40.0%), 80 have tried Oatly (45.7%), 94 have tried Pingo Doce private-labels (53.7%), and 101 have tried Continente private-labels (57.7%) (Appendix - table 8). Following that, the results conclude that Alpro is the most popular brand among PBMA consumers and Rude Health the least popular one.

To visually display a representation of how consumers perceive plant-based drinks brands, a perceptual map was designed with the help of SPSS based on the previously mentioned selected attributes: Healthy, High Quality, Information Transparency, Expensive, Environmentally Friendly, Bio, Trendy, High Variety of Offer and Savoury. With this map, it is possible to uncover any gaps in the market, acquire insights into how brands are seen in comparison to

rivals, and create efficient marketing tactics to enhance brand positioning by mapping out these associations. Businesses in any industry can benefit from using a perceptual map to better understand their clients and make strategic business decisions.

To simplify the dataset, making it easier to interpret the results, a dimension reduction was made, while retaining as much information as possible. It allows for the identification of the most important attributes that are driving consumer perceptions, making informed decisions based on those insights. It also aids in the elimination of any redundant or insignificant attributes that might not be pertinent.

An initial step in a perceptual mapping study based on factor analysis is to collect ratings of each brand's attributes from a group of consumers. Then, for statistical analysis, the average of these ratings is used. It is hypothesized that each average rating on each attribute is a linear function of variables on the underlying dimension (Wang, 2002) and that if there are no correlations among the variables, factor analysis cannot produce meaningful results (Goursuch, 1997). To choose the number of dimensions in the factor analysis, two methods were used. Following the Kaiser criterion, it is suggested to keep all factors with eigenvalues greater than 1.0, which indicates how much variation is accounted for by each factor. Factors with eigenvalues below 1.0 are regarded as irrelevant. In this case, two factors have eigenvalues greater than 1, 7.234 for component 1 and 1.124 for component 2 (Appendix - table 9). Furthermore, looking at the generated Scree Plot (Figure 1), a graph that displays the eigenvalues of each factor in descendant order, a sharp fall in eigenvalues, followed by a flat line, can be seen. Examining the location where the slope of the line transitions from steep to flat can help decide how many factors to keep. In this case, two dimensions are confirmed, accounting for a cumulative variance of 92.859%, where the first dimension explains 80.375%

of the model and the second-dimension accounts for 12.485% of the variance (Appendix - table 9).

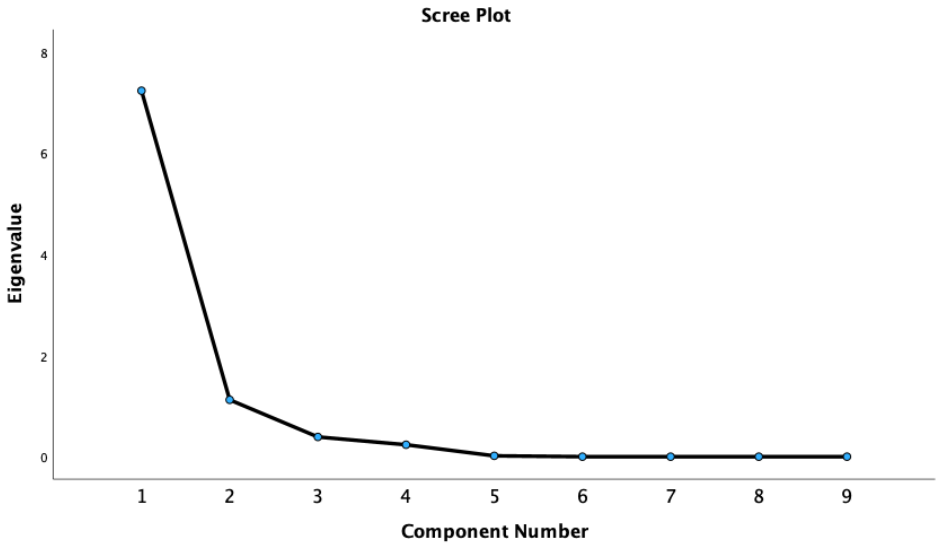

Figure 1. Scree Plot with 2 explicative components

With those results, a perceptual map (Figure 2) was generated, where Dimension I is represented by the X-axis (Component 1) and Dimension II by the Y-axis (Component 2). As can be observed, the chosen attributes are placed in the first and fourth quadrants.

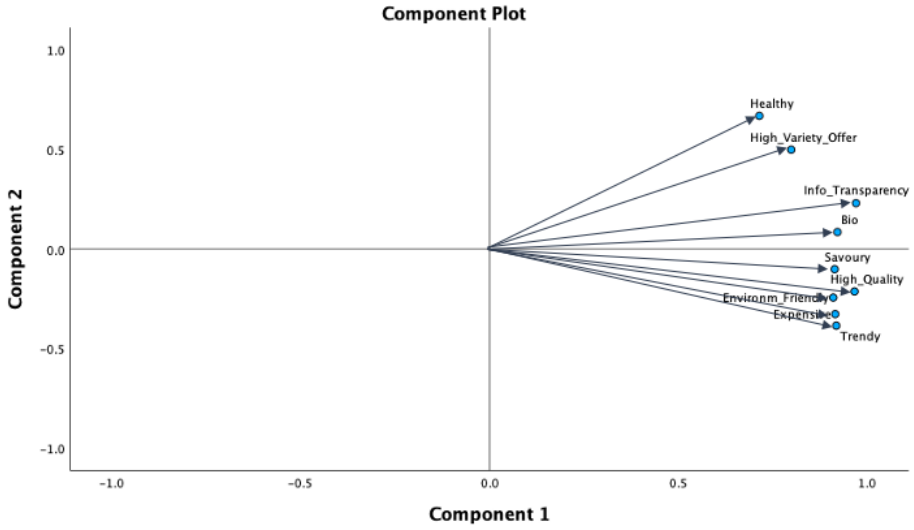

Figure 2. Perceptual map

To interpret the dimensions, it is important to review the factor loadings, which represent the correlation between the observed variables and the underlying factors. Factor loading can be evaluated using the following cut-offs: 0.32 poor, 0.45 fair, 0.55 good, 0.63 very good, and 0.71 exceptional factor influence on the variables (Comrey and Lee, 1992). To validate this evaluation, the closer the attribute vector is to an axis, the strongest it contributes to that dimension interpretation (Hair et al, 2014). When examining the factor loadings in the component matrix (Appendix - table 10), all attributes are strongly correlated to Dimension I, with Information Transparency being the most exceptional, while only Healthy has a very good correlation with Dimension II, followed by High Variety of Offer, with a fair correlation. Furthermore, Bio, High Quality, Savoury, and Environmentally Friendly have almost zero correlation with Dimension II, indicating close to no statistical relationship, and Trendy and Expensive have a poor negative correlation with Dimension II, meaning that the attributes are inversely related to that factor. That being said, Dimension I can be labeled as Trustworthy and Dimension II as Nutritious.

Additionally, by analysing the generated Correlation Matrix (Appendix - table 11), which demonstrates the inter-correlations between attributes, two groups can be clustered: group 1: Healthy and High Variety of Offer and group 2: Information Transparency, Bio, High Quality, Savoury, Environmentally Friendly and Trendy. Not only do these groups have high inter-correlations, but also their vectors display similar directions. Furthermore, none of the attributes are placed in an opposite direction (meaning negative correlation between variables), nor vectors are perpendicularly positioned (meaning no correlation). The groups are represented in Figure 3.

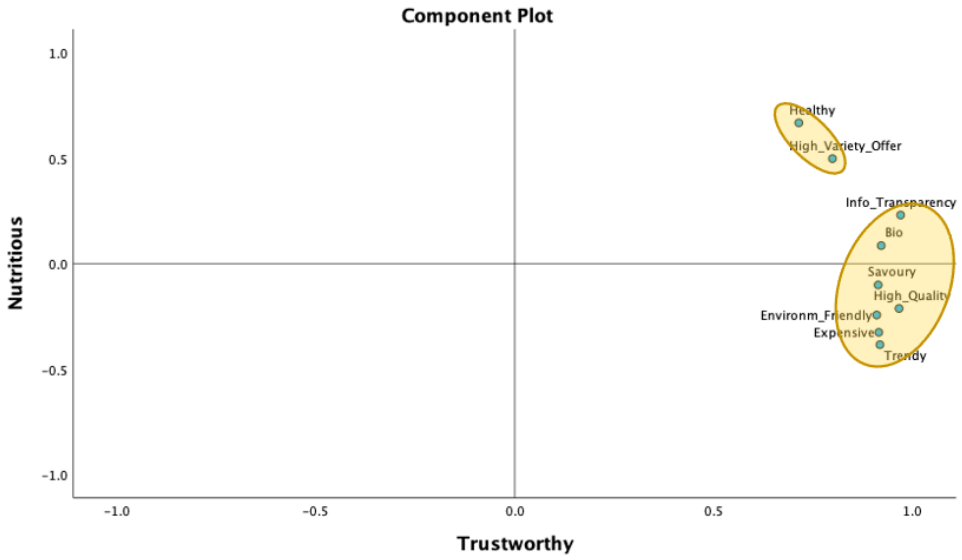

Figure 3. Perceptual maps with grouped attributes

After the graph was zoomed out, the under-analysis brands were included in the perceptual map (Figure 4), using Appendix - table 12 coordinates.

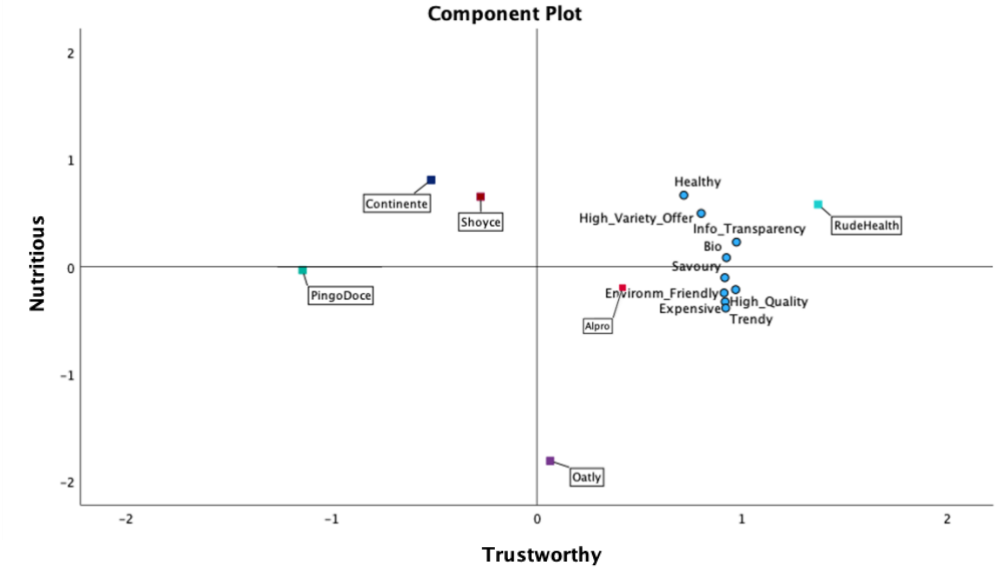

Figure 4. Perceptual map with brand positioning

After looking at the map and analysing brands' perceptions, it is noticeable that Continente and Shoyce are the ones closest to each other, meaning a similar profile while Oatly, Alpro, and Rude Health are more differentiated. To analyse each association, a perpendicular imaginary line was moved over each attribute vector, starting from the point contrary to the origin and

continuing until it meets the center of the map. Depending on the position of each brand, i.e., on which quadrant and how far from the origin the position is, a brand is either more or less linked with a certain attribute. Rude Health is, by far, the brand perceived as the healthiest, with a higher variety of offers, more information transparency, more biological, more savoury, with the highest quality, more environmentally friendly, more expensive, and the trendiest. Alpro is the second-highest brand associated with all the mentioned attributes. When it comes to Health, Shoyce is perceived as healthier than Continente, Continente healthier than Oatly, and Oatly healthier than Pingo Doce. Additionally, Shoyce is perceived as having a wider variety of offer when compared to Continente and Oatly (both extremely similar), followed by Pingo Doce. Regarding transparency, consumers perceive Oatly as having more accessible, understandable, and readily available information than Shoyce, followed by Continente and Pingo Doce, respectively. The same order of brands' associations is applied for the Bio, Savoury, High Quality, Environmentally Friendly, Expensive, and Trendy attributes. As so, it can be concluded that brands' association rankings change between attribute groups 1 and 2.

It is also fundamental to note that the longer the vector, the more evident the differentiation of that attribute among the brands (Wedel and Kamakura, 2012), hence we can infer that it is easier for consumers to differentiate the chosen brands based on the Information Transparency and the High-Quality attributes and harder based on Health, even though the differences in vector length is not that noticeable. Additionally, the angles between the vectors show how similarly consumers view different brands, indicating that brands perceived as having one attribute will also be linked with another (Torelli and Sen, 2012). In this case, the angle between Information Transparency, Bio, Savoury, Environmentally Friendly, High Quality, Expensive, and Trendy is little, indicating a high similarity. The same happens for Healthy and High Variety of Offer. This may happen due to the similarity of concepts. For example, in this context, Bio refers to products that are produced using organic farming methods. This method relies on the natural

and ecological processes of agriculture. That way, bioproducts are generally considered to be more environmentally friendly and expensive than conventional-produced goods.

When comparing private-label brands to non-private-label brands, it is noticeable that one of the chosen private-label brands, Continente, has more similarities to Shoyce and Oatly (A-labed brands) when it comes to group 1 attributes, i.e., Healthy and Variety of Offer, instead of Pingo Doce (the other studied private-label). Indeed, Continente is even perceived as being healthier than Oatly. Thus, one cannot say that private-label brands are perceived as more or less Healthy with a wider or shorter variety of offers. On the other hand, the difference between the two groups of brands becomes noticeable in group 2 attributes, i.e., the studied private-label brands are perceived to be less transparent when it comes to information, less biological, with lower quality, less savoury, less environmentally friendly, and less trendy. Nevertheless, there is always a clear distinction between Continente and Pingo Doce, where Continente is rated substantially higher in all consumer associations. Pingo Doce is positioned in the negative region of Dimension I, being generally considered a non-trustworthy brand.

That being said, it can be concluded that, even though private-label brands have different associations than non-private, they can still differentiate from each other. This is because both retailers apply different strategies. Tactics like having exclusive items, distinctive packaging, and unique features, can help brands to successfully differentiate (Braak et al., 2013). Yet not only a differentiation strategy is necessary for them to succeed well. Having a good pricing strategy that attracts cost-conscious consumers and a branding strategy that is focused on creating a unique brand identity that resonates with the consumers, emphasizing values, and building brand awareness is needed (Aaker and Joachimsthaler, 2012). Lastly, and most importantly, privately labeled products need to have comparable quality to the non-private-

labeled, thus building trust and loyalty with its customers. To maintain consistency and client satisfaction, strict testing and quality control should be frequently done.

4. Conjoint analysis

Moving on to the study of consumers' preferences, the second, third and fourth objective of the research question will be addressed – consumer segments will be identified and answers to which attributes are more important for consumers, and how their motivations are impacted by demographics will be provided. This chapter will first focus on the methodology of the quantitative research employed, which is conjoint analysis, followed by the analysis of the results.

4.1. Methodology

To predict consumer choice behaviour, comprehending more about participants' preferences and the importance of each attribute and feature, a choice-based conjoint analysis will be conducted. This method asks respondents to select their preferred product from each set of product profiles that are presented to them (Orme, 2010).

Conjoint analysis is a technique that involves deconstructing a product into its individual components, which are referred to as attributes and levels. It then relies on the evaluation participants make on various combinations of attribute levels (Conjoint.ly, 2017). According to Malhotra et al. (2017), this analysis "attempts to determine the relative importance that consumers attach to salient attributes and the utilities they attach to the level of attributes".

The survey was developed using the Conjointly platform, specifically the Generic Conjoint option, which is the "most common type of discrete choice-based conjoint design" (Conjoint.ly, 2017). It was also possible to analyse data within the platform and access insights such as the relative importance of attributes, the relative value by levels, the marginal willingness to pay,

and the ranked list of product constructs. The relative importance of attributes “estimates how important each attribute is relative to the other attributes” (Conjointly, n.d.), while the relative value by levels indicates “preferences for levels relative to other levels” within an attribute, in the form of a chart. Values in this chart are 0-centred within each attribute and high positive values mean relatively high preference (Conjointly, n.d.). Furthermore, according to Conjointly (n.d.) the marginal willingness to pay represents “the amount of money consumers are willing to pay for a particular feature on average” and is called "marginal" because it is relative a selected baseline level. Finally, the ranked list of product constructs consists in a list of all product combinations ranked by consumers’ preferences.

The researchers decided to divide the survey into four sections: 1) Respondent Profiling, 2) Demographics, 3) Consumer Preferences, and 4) Consumer Motivations. The order of the sections was decided in a way that the platform can screen out participants that do not meet the target profile requirements, and that demographics on all respondents are gathered.

(1) The first section served as an initial screening phase to ensure that only the appropriate profile of respondents participated in the survey. Therefore, respondents had to confirm they corresponded to the target profile of this study - Portuguese consumers of PBMA who are 18 years of age or older – before moving on to the next questions.

(2) The Demographics section was meant to gather information on respondent characteristics such as age, gender, level of education, employment status, and household income for segmentation purposes.

(3) The third section studied consumers preferences. Respondents were presented with three alternatives of PBMA products with different features and had to go through eight choice sets, in which they had to choose one of the three options or none (Appendix 1).

The most crucial part of the survey design for the conjoint analysis was deciding on which attributes and attribute levels (features) to include. The researchers tried to understand the consumer decision tree (CDT) and therefore the logic behind purchase decisions through market research, literature review and preliminary research. However, the category manager at Pingo Doce stated that there still was not a defined CDT for this category since PBMA is still considered a recent category of products. Moreover, to maintain consistency, the product alternatives presented to respondents all consisted of 1L cartons of PBMA. This was done to ensure that the survey would provide quality results and not biased results given the major importance of one attribute above all others. Therefore, considering all that was learned until this point in research, the following attributes and levels were chosen:

Attributes	Features	
Brand	- Alpro - Continente - Pingo Doce	- Oatly - Shoyce - Rude Health
Type of Ingredient	- Oat - Soy - Almond	
Added Aroma	- Vanilla - Chocolate	- Red Fruits - No Aroma
Added Sugar	- With Added Sugar	- Without Added Sugar
Specialty	- Produces Foam	- Does not produce Foam
Mouthfeel	- Watery	- Thick
Price	- 0,99€/L - 1,74€/L - 2,49€/L	- 3,24€/L - 3,99€/L

Table 1. Attributes and Attribute Levels/Features for the Conjoint Analysis

The reason for choosing these specific attributes and attribute levels will be explained below:

Brand

Until now, it has been established that consumers heavily rely on brands when making purchasing decisions, but the extent of their influence in the context of PBMA remains uncertain. Although there is a broad range of brands available in the Portuguese market, Alpro is a clear market leader in terms of recognition and has many loyal customers. Nevertheless, it is crucial to consider the significant market share of private-label brands, particularly Continente's and Pingo Doce's, which account for 50% of the market, and determine whether this is related to their lower price-points, or it is a true consumer preference. Moreover, the other three brands that occupy a significant position in the Portuguese market have been considered as attribute levels. While Oatly and Rude Health are premium brands that cater to a specific consumer group, Shoyce stands out for its low price point and "made in Portugal" label.

Type of Ingredient

According to interviewees, the main ingredient present in PBMA is the most important attribute for consumers when making a purchase decision. 79% of respondents considered Oat as their drink of choice, while 57.2% prefer almond milk and 28.6% opt for soy. Although the soy segment's significance in the market has been decreasing and is expected to continue to do so, it still maintains a significant presence. This trend is due to gains in oat, almond and rice-based beverages. "Non-soy base gains importance and preponderance in the global market, corresponding to 57% of the weight of sales – major growth in the oat and almond segment", according to Margarida Roldão from Jerónimo Martins. Thus, it is relevant to analyse the real importance of this attribute and which main ingredient is in fact preferred by Portuguese consumers.

Added Aroma

Although “added aroma” was not a topic frequently mentioned in preliminary research, it appears to be an important attribute to consider, when looking at the current product offering in the PBMA Portuguese market. According to Moss et al. (2022), “the flavouring (chocolate and vanilla) increased the participants’ liking of almond and oat PBAs. Future studies should investigate other PBAs made from different ingredients and how flavouring can improve the acceptability of PBAs.”. Hence, it seems relevant to examine the influence of this attribute in consumer preferences.

Added Sugar

As mentioned in the data provided by market expert Susana Nunes, the Portuguese consumer is increasingly concerned about sugar consumption and seeks out products with “sugar free” labels. Furthermore, there has been a growth in sales of PBMA without added sugar, regardless of the main ingredient (oat, soy, or almond), as reported by a contact from Jerónimo Martins. However, preliminary interviewees yielded conflicting results, with some respondents preferring sweeter PBMA, while others consider sweetness to be their most disliked characteristic. Therefore, the researchers aim to explore the growing importance of this attribute further, and whether there is a clear preference for PBMA with no added sugar.

Specialty

It appears worthwhile to investigate the attribute of specialty PBMA, particularly in light of insights gained from the testimony of Oatly's Gonçalo Costeira and feedback provided by interviewees. Despite the prevalence of espresso in Portugal, there appears to be a growing demand for PBMA that can produce foam, especially in the context of coffee consumption. When asked about potential features they would like to see in new products, interviewees consistently emphasized the importance of foam-producing capability. Innovations in "barista"

specialty PBMA, particularly those that work well with oat milk, have been developed to meet this need. As such, the attribute of specialty, which focuses on the ability to produce foam, presents an important area for exploration to determine whether this demand is growing in the Portuguese market.

Mouthfeel

Sensory quality, as previously mentioned, is a considerable barrier to consumer adoption of PBMA, leading to the development of innovative solutions to cater to their preferences, particularly in terms of texture. However, it is crucial to take into account that the mouthfeel can vary depending on several factors, including the main ingredient, the production process, and the quantity of water or other ingredients in the product. The preliminary interviews showed that texture and consistency are important attribute for consumers and indicated a clear preference for a thicker consistency in PBMA, while watery texture was one of the most disliked characteristics. Nevertheless, the researchers acknowledge that mouthfeel is a subjective attribute that can vary according to individual preferences, hence, the inclusion of this attribute.

Price

This is a vital attribute to be included in this survey, especially to analyse consumer's willingness-to-pay. Researchers have noticed that PBMA is a very price-sensitive category, with the price sometimes being considered a barrier for adoption and one of the most important considerations in purchase decisions. Prices (attribute levels) were determined after consulting current market prices, given that the aim was to replicate the actual market prices as accurately as possible. A price range of 0,99€/L to 3,99€/L was considered, with a consistent 75 cents

interval between each price point, to facilitate analysis. Five price points were included, with the highest price reflecting the premium prices of specific brands.

The order in which the attributes were presented to the respondents was deliberately chosen to replicate a real shopping experience. This approach was based on the consideration of various packaging examples and the order in which features typically appear on product packaging, from top to bottom, as well as the location of pricing on shelves. By presenting the attributes in the same order, the researchers aimed to create a natural and familiar purchasing process for the respondents, which would allow them to make choices that reflect their actual preferences as accurately as possible. The goal was to obtain results that are as truthful and reliable as possible and presenting the attributes in the same order was seen as an important factor in achieving this objective.

Furthermore, the choice sets did not include any prohibited pairs of levels, which means that the researchers found that all combinations of features could potentially be available and could lead to different results.

(4) In the Consumer Motivations section, respondents were asked to allocate 100 points accordingly to their personal motivations to consume PBMA. This aimed to gather data for further analysis, such as segmentation purposes and to identify any possible correlations between preferences and motivations. Four drivers for consumption were proposed, considering the literature review and preliminary interviews:

   a. Healthier or more nutritious choice: despite the lack of scientific proof, PBMA's are perceived as a healthier alternative to cow's milk by 50% of interviewees due to their lower fat and calorie content, making this a significant driver for health-conscious consumers.

b. Health Issues: as previously noted, health concerns such as lactose intolerance are a significant motivator for the consumption of PBMA, particularly in Portugal, where 30% of the population is affected by this condition. In fact, 50% of interviewees cited health issues as their primary motivation for consuming PBMA.
c. Ethical Reasons (sustainability concerns or animal welfare): while not a primary concern for the Portuguese population, this factor is more significant for educated consumers who are aware of the process and consequences of cow's milk production, and it leads them to switch to PBMA.
d. Flavour Preference: while consumers were initially deterred from PBMA due to its different taste compared to cow's milk, nowadays consumers have developed a preference for certain PBMA flavours over the dairy alternative, as stated by 22% of interviewees.

The survey was made available on March 27th, 2023, through various social media platforms, such as LinkedIn, Instagram, Facebook, and WhatsApp. Responses were accepted until April 8th, 2023, after which no further submissions were allowed.

4.2. Analysis and results

4.2.1. Conjoint Preference Share Simulator

Using the Preference Share Simulator, a baseline scenario resembling the true PBMA market will be tested, and price elasticity of demand will also be measured with price sensitivity plots.

Through the Conjointly platform, the researchers will illustrate the offerings available on the Portuguese PBMA market considering the attributes and levels included in the survey. A baseline scenario was described as accurately as possible, although the analysis was limited to the oat-based market offerings. The oat-based market was chosen given its prevalence in the

level preferences, as well as throughout the research. Furthermore, the brand Oatly sells exclusively Oat-based beverages, making it necessary to choose this market so all brands can be studied. All products currently on the market were considered, varying levels in the attributes of "added aroma", "added sugar", "specialty", and of course, price. Here, prices correspond to the average price each product is being sold in the market. Moreover, since the "mouthfeel" attribute cannot be perceived through its packaging, the products were all considered as "thick", the preferred level for most consumers, to maintain consistency in results. The product offering in this baseline scenario is presented in the following table (Table 2):

	Type of Ingredient	Added Aroma	Added Sugar	Mouthfeel	Specialty: Foam	Price
Alpro 1	Oat	None	No	Thick	No	2,59€
Alpro 2	Oat	None	No	Thick	Yes	2,68€
Alpro 3	Oat	None	Yes	Thick	No	2,48€
Continente	Oat	None	No	Thick	No	1,14€
Pingo Doce	Oat	None	No	Thick	No	1,14€
Shoyce 1	Oat	None	No	Thick	No	2,18€
Shoyce 2	Oat	Chocolate	No	Thick	No	2,18€
Oatly 1	Oat	None	No	Thick	No	2,38€
Oatly 2	Oat	Chocolate	No	Thick	No	2,68€
Oatly 3	Oat	None	No	Thick	Yes	2,68€
Rude Health 1	Oat	None	No	Thick	No	2,88€
Rude Heatlh 2	Oat	None	No	Thick	Yes	4,75€

Table 2. Baseline Oat-Based Market

The preference share simulator will estimate the percentages of preferences for these offerings, which are approximate market shares. They are not a perfect representation of market shares because they do not consider shelf space, frequency of purchase, and mental availability (e.g., the fact that the duration that a product has been available in the market influences brand awareness and loyalty) (Conjointly, 2023). Additionally, preference shares are more closely related to the concept of volume shares, since a more expensive product will have a higher market share than a less expensive product with the same volume share (Conjointly, 2023).

The preference shares for the combinations listed in Table 2 can be observed in Figure 8. This scenario, which aims to replicate the real oat-based milk alternatives market in Portugal, indicates that Alpro is the preferred brand in the market, with 29.6% of preference shares. Continente is the second most preferred brand, followed by Oatly, Pingo Doce, Shoyce and Rude Health, which have 21%, 15%, 12.6%, 9.1%, and 8.4% of preference shares, respectively. 4.4% of the market is not being satisfied, which can be explained by the fact that products such as soy, almond-based milk alternatives, and other product features are not being considered in this simulation while they were covered by the survey.

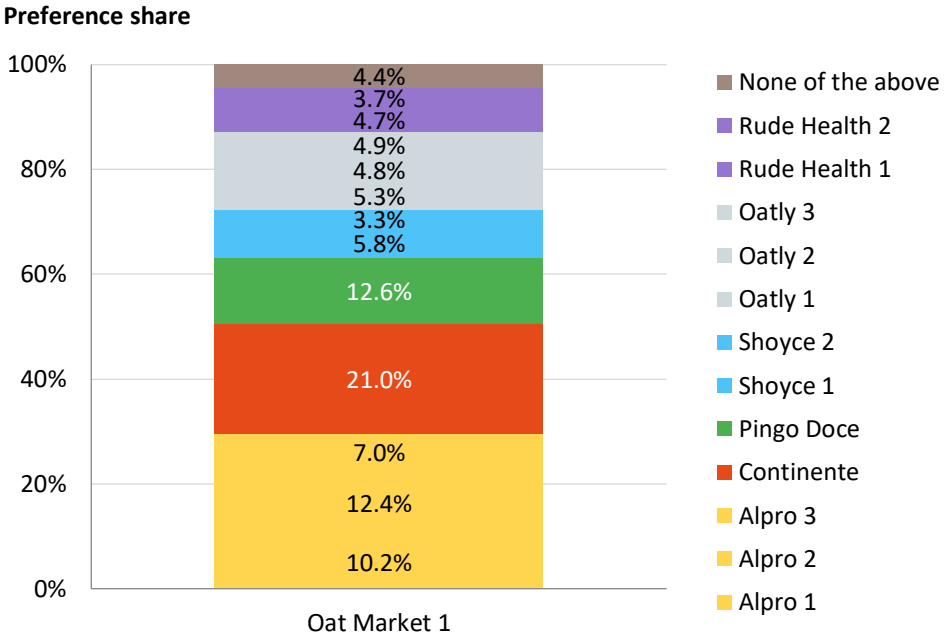

Figure 5. Preference Shares in Oat Market Baseline Scenario 1

Comparing the results of the baseline scenario with the assumption of market shares in the preliminary research, the simulation has provided more balanced results. Oatly, Rude Health and even Shoyce present inflated preference shares possibly due to the simulation's lack of consideration of the relatively recent entry of these other brands on the Portuguese market.

The next scenario will be even more narrowed down for the purpose of the analysis of price elasticity of demand, to avoid creating 11 simulations. Hence, only oat-based beverages, with no added sugar, no foam capability, no added aroma, and thick mouthfeel will be considered for this experiment. The product concepts in this scenario represent the staple product, composed of the preferred features according to survey respondents, and only differ in price and brand.

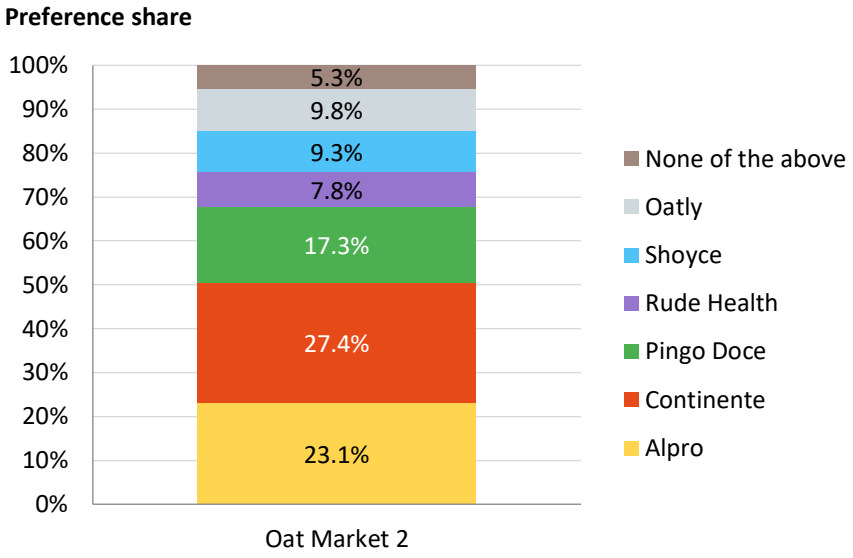

Figure 6. Preference Shares in Oat Market Baseline Scenario 2

The figure above (Figure 9) illustrates that the change in product concepts impacted the distribution of preferences. Brands whose quantity and variety of products offered decreased in this scenario have experienced a decrease in their preference share as well, except for Shoyce. On the contrary, the preference share for private-label brands has increased. As expected, with a reduced number of options there is an expansion of preference share in "none of the above". Also, although the data considers consumer preferences, brand loyalty and brand awareness are not accounted for, which have been proven to be a great strength for Alpro. Furthermore, Alpro has very relevant shelf space, which is not contemplated. Even in smaller sets of assortments,

Alpro is consistently present and in in-store layouts, it is usually displayed next to dairy milk as well as in the healthier sections.

Since price is one of the most valued attributes in the purchase decision of a PBMA consumer, this section will focus on the price elasticity of demand. According to Ferrell and Hartline (2011), "price elasticity refers to customers' responsiveness or sensitivity to changes in price" and "the relative impact on demand for a product, given specific increases or decreases in the price charged for that product". Using this market baseline, six price sensitivity plots were run, one for each brand in consideration, exposing the share preferences for each price-point considered in the survey. The figures 80 to 81(Appendix) illustrate how a change in the price offering of one brand affects the preference share of that respective brand but also other brands. The price level change and consequent preference shares are summed up in the table 25 (Appendix), one for each brand.

Considering all other attribute levels constant, the optimal price for brands in terms of demand is always 0,99€, making it clear that consumers prefer the lowest price point. Moreover, the elasticities represented in the table above were provided by Conjointly, considering the price range used throughout the survey, which is [0,99-3,99€]. They represent an average of all the elasticity of demand between each price level. All price elasticities of demand are inelastic, except for Pingo Doce's, meaning that, on average for all brands except Pingo Doce private-label, an increase in price by 1% leads to less than 1% decrease in the quantity demanded, indicating that consumers are not very sensitive to price changes (Ferrell & Hartline, 2011; Conjointly, 2023). Hence, Alpro consumers have the most positive reaction to a price increase, followed by Rude Health, Shoyce, and Oatly.

Since market experts called consumers price-sensitive, an elastic demand was expected. However, an inelastic demand can be justified by the fact that FMCG products are usually

inelastic, particularly essential goods, which consumers deem as necessary and thus are willing to pay more to obtain them (Conjointly, 2023). Since PBMA products are a substitute for an essential good, their market dynamics could be similar. Alpro's inelastic demand is possibly due to its strong brand differentiation resulting in brand loyalty and high perceived quality, making consumers feel that "no competing product can take its place" (Ferrell & Hartline, 2011).

For the Continente brand, a 1% price growth results in a 0.9% demand decrease, on average. Pingo Doce's demand elasticity is equal to -1, meaning it has a unitary demand, this is, that, on average, an increase in price results in a proportional decrease in volume. Hence, private-label brands' consumers are more sensitive to changes in price. Moreover, from figures 83 and 84 (Appendix) it can be concluded that when Pingo Doce's price-point increases, Continente is the main benefiter, and the same happens the other way around.

In order to gain a deeper understanding of consumer preferences, a third scenario was constructed, represented in the figure 86 (Appendix), to investigate if consumers would choose an A-Label alternative if both private-label brands were priced the same, for different price-points. It is noteworthy that private-label brands are meeting a need in the market, as indicated by the increase in preference shares for "none of the above" with the increasing price. With the increase in prices of private-label brands, A-label brands experienced a significant increase in their preference shares, particularly Alpro, increasing in 10 percentage points. This finding indicates that consumers who previously preferred private-label brands may switch to A-label brands, specifically Alpro, in the event of a price increase for private-label products. Moreover, the results of the scenario demonstrate that even when priced the same as the leading brand Alpro, at 2,49€, Continente remains the second largest player in the market. However, when practicing a price point of 3.99€, Pingo Doce, loses 11.1 percentage points and only holds 6.2%

of the preference shares, while Continente experiences a larger decrease in preference shares (17.3 percentage points) but still holds a significant 10.1% of preference shares.

5. Confirmatory experiment

The following chapter covers the extra research, an experiment, that was conducted by asking some questions to a relatively small sample of people, and a blind taste test (Appendix – figure 87). In this particular case, the objective of the blind test was to gather more information on what consumers consider is lacking for the Continente private-label to surpass Alpro and become the biggest player in the market, as it has been verified a growth trend of private-labels in this market. The two brands were chosen due to the previous conjoint results, i.e., Alpro and Continente were considered to be the most preferred brands among the studied sample and cover similar consumer needs according to the preference share analysis. Thus, the test consisted of asking consumers for their opinion on which brand they preferred, blind taste test them with two oat drinks (without added sugars), one from each brand, and ask for strategic recommendations.

5.1. Sample characteristics

The present data analysis was performed on a sample of 15 consumers of PBMA. Gender-wise, the sample was comprised of 9 female respondents (60%) and 6 male respondents (40%). Age-wise, a majority of the participants fell within the age group of 18-24 years (66.67%). However, to ensure the reliability of the conclusions drawn, the sample also included 2 participants aged between 25-34 years, 1 respondent aged between 45-54 years, and 2 participants belonging to the age range of 55-64 years. As for the educational background of the respondents, it is noteworthy that the sample consisted of individuals with a high school education (13.33%), bachelor's degree (33.33%), master's degree (46.7%), and MBA (6.67%). In terms of

employment status, the largest subset of respondents was employed (66.67%), while the sample also included students (26.67%) and retired individuals (6.67%). Finally, regarding the monthly household income, 40% of the participants reported a monthly income of less than or equal to Eur 750, 20% reported a monthly income between Eur 751 and Eur 1500, 26.67% claimed to have a monthly income between Eur 1501 and Eur 2500, and only 13.33% of the participants had a monthly income between Eur 2501 to Eur 3500.

5.2. Results

Firstly, the participants were asked about which of the two brands of PBMA they preferred. Alpro obtained 60% of preferences, being the leading brand, while Continente achieved 40%. Upon the analysis of the reasons for participants to choose each of the brands, researchers gathered that 1) Alpro is seen as a safe, reliable, expert, practical, responsible, familiar, reputable, credible, and consumer-friendly brand, in terms of how it conveys more technical information to consumers, while 2) Continente is seen as a brand that maximizes the quality-price ratio. Additionally, the researchers highlight the importance of previous purchase experiences and its weight in subsequent purchase decisions – if a consumer has a bad experience with a purchased good, they will opt for a different brand in the future.

Afterwards, participants were asked to answer the following question: "If the two brands, Alpro and Continente, were at the same price, which one would you choose and why?". This was done to test for shifts in brand loyalty if the price factor was not a constraint. It was concluded that this scenario had a small impact on brand loyalty, as only 20% of the participants changed their choice.

Subsequently, the participants were given two oat-based drinks to taste, which had similar attributes but belonged to different brands: Alpro and Continente, unknown to the interviewees.

Afterwards, they were asked which of the two options they liked better – this was important to identify whether the products differed greatly from each other, independently of the brand. In sum, it was concluded that 66,6% of the inquiries chose Alpro. Also, 26.7% of the individuals changed their choice after trying the product – 75% of them altered from Continente to Alpro, and 25% from Alpro to Continente. Thus, the researchers confirmed that Continente private-label is not as pleasant when it comes to the taste as the Alpro, for this set of consumers. Hence, considering the differences between the attributes of the products, researchers concluded that there are other factors that might be more important than the taste in the choice of PBMA, for this sample.

Finally, participants were questioned about potential strategies for making the brands they had not picked better and more appealing, thus becoming an option of choice. On the one hand, suggestions for Alpro mainly concerned the brand's prices, which should be reviewed since its products represent an essential part of the basket of goods for consumers. On the other hand, suggestions for Continente's private-label revolved around the brand's need for more information transparency, by improving the way it communicates technical terms, e.g. through packaging and labels. More than that, respondents suggested for the brand to expand its range of plant-based products as a way of demonstrating expertise and research in these types of products. Lastly, respondents recommended for Continente to invest in a more credible and reliable brand image, becoming a consumption option for people with health issues.

In sum, by studying this sample, the researchers were able to confirm Alpro was the leading brand and preferred choice of participants, mostly impacted by its brand image. Nonetheless, it was proved that Continente's private-label offering could leverage its market position and become more popular by incorporating some of the suggestions presented above, since it has

already gathered the strength and resources to benefit from the general industry trend of private-label expansion.

6. Conclusion

6.1. Discussion

According to the literature review, our research question "Plant-Based Milk Alternatives: Perceptions and Preferences Of Portuguese Consumers", and the four main objectives stated in the introduction, all of which can now be approached with the information and research gathered. Moreover, by discussing the key themes and patterns that emerged from the data, the chapter will provide valuable insights into how consumers perceive PBMA and what factors motivate their decision-making process when choosing PBMA products.

In the literature review, there is an introduction to Nutrition Marketing and Green Marketing as two concepts that shape consumer behaviour and influence the purchasing process. Firstly, by studying Nutrition Marketing, it became clear that consumers are growing more concerned about their health and how it is linked to their diet. Thus, individuals are looking out for healthy foods, with particular attention to food product labels as the central point that guides their spending decisions. Subsequently, research proved that the main motivators for the consumption of plant-based products are, as stated earlier, often triggered by health, sustainability, and ethical motivations (Vaikma et al., 2021). This is a statement that varies from individual to individual, mainly because of the ethical motivations that also include cultural preferences and followings. In this sense, it is vital not only for consumers, but also for companies and third-parties to ensure that these labels are clear, concise and transparent. Secondly, the consumer point of view regarding sustainability and growing concerns about the environmental crisis has led companies to respond accordingly, by developing green marketing strategies that are aligned with other business units. The ultimate goal is to meet customer needs

by offering green products that meet their standards, building a way for companies to create competitive advantage and leverage it in a market that is more and more competitive.

To better prove what was studied in the literature review, the responses of the Perceptual Map analysis are going to be linked. The results on the Perceptual Map allowed for the division of the PBMA consumers and non-consumers into two segments. The demographics of the sample were considered to better understand if they had any correlation with the consumption of PBMA. As mentioned in the literature review and proven later on the Perceptual Map, gender does influence the PBMA market, since the researchers can conclude that women are more prone to lead a dairy-free diet than men. According to (Giacalone et al., 2022), in general, women are more likely than men to adopt a vegetarian diet, even though men frequently take PBMA more readily. As for the Conjoint Analysis, the study discovered that while buying PBMA, men exhibit stronger price sensitivity than women, favouring less expensive selections and avoiding the most expensive one.

Additionally, demographic data showed that younger age groups have a stronger propensity to consume PBMA. As it was proven in the second part of the literature review, the knowledge of the harmful impacts of food additives on health is growing, especially among Millennials. This well-informed consumer group is currently spending more money on natural and organic goods than Generation Z. Due to increased information, this generation is also more likely to adhere to a vegan diet (Choudhury, 2023). The Conjoint Analysis also made true the hypothesis stated earlier on when the researchers discovered a relationship between educational attainment and preferences for various PBMA flavours. High school graduates typically like almond-flavoured PBMA, whilst MBA and Ph.D. holders favour oat-based PBMA. Highlighting that better informed customers research products before buying them and choose healthier solutions.

As the Preliminary Research showed, when consumers were asked about their preferred type of PBMA, 79% chose oat, followed by almond at 57% and soy at 29%. These results are in accordance with the literature review that shows soy milk was the most consumed type of PBMA, up until a few years back, in the early 2010s, when oat and almond milk were introduced in coffee shops and supermarkets (Devoney, 2022).

As the groups' research shows, regarding non-consumers, the primary explanations center on a preference for cow milk, a distaste for PBMA, or a lack of milk consumption altogether. Diving deeper in the non-consumers rational, the group gathered justifications such have no interest in trying, find it too expensive, find cow milk more nutritional, and justify still living with their families and following their habits, besides the ones mentioned earlier as primary explanations. As stated earlier, according to the literature review, the lack of knowledge on a certain product leads to the non-consumption of the same, and in the PBMA market there is still a lot of questions regarding different topics already approached (e.g., the nutritional values). "Majority of these milk alternatives lack nutritional balance when compared to bovine milk" (Sethi et al., 2016).

Price is also an important factor regarding PBMA, as mentioned, sales of plant-based alternatives are more impacted by price increases than the sales of dairy products. These findings are in line with the fact that dairy products are rather inelastic (Adams et al., 2022), supporting the research about the Portuguese population in this topic (Pires et al., 2021). Nevertheless, times are changing and so are consumers. In fact, although an elastic demand was expected, results from the conjoint analysis suggest that PBMA have an inelastic demand. This is possibly because these products are becoming a substitute for dairy products, an essential good, hence, they could have comparable market dynamics.

Consumers place the added aroma at the top of their priorities list (25.4%), followed by brand and price (22.7% and 20.6%, respectively). As stated earlier, the importance of sensory quality is on the rise when mentioning PB products. Firstly, consumers were driven by the flavour that would relate the most to cow milk, but with the introduction of several new textures and flavours, the PBMA market reacted and changed their offerings to what the groups' results show. The PBMA with oat and almond ingredients was favoured by participants, while soy-based beverages were the least preferred.

The flavour preference of the respondents was the most important element that determines their consumption of PBMA (30.5%), followed by healthier or more nutritious reasons (28.1%), health concerns (21%), and ethical considerations (20.4%). Ethical considerations can also include the sustainability factor, as well as culture associations, which is something hard to turn around since is centered on beliefs. As for the sustainability matter, as proven earlier on the literature review, PBMA is more sustainable than the whole process around cow milk, however it's not enough of a parameter to make consumers change their habits.

Lastly, the most popular product among consumers is Alpro, which is interestingly preferred even by those with greater earnings above more expensive alternatives like Rude Health. This can be explained by the prestige around Alpro and its brand image, "Since 1980, Alpro has had the single minded purpose to pioneer healthier eating and sustainable living. This gives the brand a lot of credibility and know-how." The years-long effort of the brand to develop, leading to a distinctive and substantial portfolio of plant-based goods as part of a long-term vision and strategy, illustrates its dedication to strive for continual nutritional and sustainable optimization (Alpro, 2020).

Overall, the study's findings offer insightful information about consumer preferences and purchase behaviour for PBMA. The findings both refute and support some initial hypotheses,

emphasizing the value of undertaking in-depth research to better understand customer behaviour.

Furthermore, the Conjoint Analysis results reveal that flavour is the most crucial consideration for customers when choosing PBMA, which goes against the initial hypothesis that health concerns were the primary factor driving PBMA adoption.

6.2. Findings and Managerial Recommendations

6.2.1. Research Findings

The following sction will present a synthesis of the study's major outcomes and provide an answer for each research objective.

(1) Understand consumer perceptions of private-label offerings as well as of top market players.

The researchers used a perceptual map analysis to understand consumer perceptions on private-label and A-label brands regarding nine attributes. Through a factor analysis, two dimensions were created to facilitate the interpretation of results. Dimension I, called Nutritious, paired "Healthy" and "High Variety of Offer", while Dimension II, called Trustworthy, grouped the attributes "Information Transparency", "Bio", "High Quality", "Savoury", "Environmentally Friendly" and "Trendy". In terms of perceptions, Rude Health is the most linked with the Nutritious and Trustworthy dimensions, followed by Alpro. The results also indicate that both private-label brands are perceived to be less transparent when it comes to information, less biological, less trendy, less savoury, less environmentally friendly, and with lower quality when compared to non-private-labels. However, Continente has a more similar profile to Shoyce and Oatly when it comes to "Healthy" and "Variety of Offer" attributes, contrary to Pingo Doce.

Hence, although private-labels are less linked to the Trustworthy dimension, they are still perceived in different ways, as more or less Healthy, with a wider or narrower Variety of Offer.

(2) Identify which attributes are more important for consumers in PBMA and what their preferences are.

Through the conjoint analysis, it became clear that brand, added aroma and price are the most important attributes for Portuguese consumers, followed by type of ingredient and added sugar. Specialty and mouthfeel were the least important attributes, although each of them might present slight variations according to the samples' demographics. When analysing the relative importance by level, it became evident that most consumers favour the brand Alpro and the private-label alternative is Continente, with the second highest score, prefer no added aroma and lower prices. Finally, the analysis of the Marginal Willingness to Pay led to the conclusion that Portuguese consumers are willing to pay more if the product is oat-based, from the Alpro brand, with no added aroma. Consumer preferences, however, have been changing with a growing preference for Continente's private-label, pointing to a change of pattern in the Portuguese PBMA market.

The extra investigation also concluded that brand image—whether Alpro's or Continente's—has a significant impact on the criteria that carries the most weight during the decision-making process. Additionally, it was discovered that prior buying experiences matter and have an impact on subsequent purchase choices. The consumer is more likely to choose a different brand in the future if they have a negative experience with a product they have purchased.

(3) Understand how demographics influence consumer motivations to drink PBMA, and which considerations are responsible for discouraging non-consumers.

Throughout the literature review and preliminary research, four main drivers for PBMA consumption were identified: being perceived as a healthier or more nutritious choices, health issues such as lactose intolerance or others, ethical reasons from sustainability concerns to animal welfare, and a preference for the flavour PBMA provides. Results indicate that flavour preference is the most influential driver, followed by healthier choice, health issues and ethical reasons being the least important for respondents. Researchers found that consumers' age influences the "health issues" and "flavour preference" drivers. Respondents who are motivated by health issues tend to be older, while younger consumers are more motivated by the flavour preference. Gender has also been proven to have an impact on consumers' motivation, since males are mostly motivated to choose PBMA for being a more nutritious choice.

When it comes to non-consumers, the survey indicated that the main barriers for consumption are preferences for dairy milk, a dislike for the taste of PBMA, and the non-consumption of any type of milk. The results confirm that the main considerations discouraging non-consumers are the lack of similarity to dairy milk, sensory quality, and a higher price-point.

(4) Which consumer segments can be identified and what are their preferences and motivations differ across segments?

Two key consumer groups for PBMA were identified by the study. The first segment, dubbed "The Young Trendy Consumer," is made up of young adults between the ages of 18 and 24, who account for 65% of the sample population and have a variety of income, employment, and educational backgrounds. Their preference for the PBMA flavour, which accounts for 73.3% of their consumption motivation, is the main factor in their purchase decision. This cohort, which is primarily Generation Z, has significantly influenced the acceptance of non-dairy milk alternatives. When buying PBMA, their primary concerns are the added aroma, brand, and price. Over competing brands like Continente, Oatly, Rude Health, Shoyce, and Pingo Doce,

they frequently choose Alpro. Oatly and Continente, however, are also thought to be excellent options for this market. They share the typical consumer's preferences for other characteristics.

The second segment, referred to as "Non-private-label Shoppers," makes up only 7% of the sample and is primarily made up of people aged 25 to 34 years old, with family incomes ranging from 751 to 1500 Euros. They favour added flavour, brand, and price when making purchases and are brand enthusiasts. Private-label PBMA brands are generally avoided, and Alpro is preferred over Continente, Rude Health, Shoyce, and Pingo Doce. Oatly is also a favourite. They have similar tastes to the typical consumer in terms of other qualities. While flavour preference is the most significant motivation for this segment, they also view PBMA as a healthier or more nutritious option. Millennials that are brand loyalists, active on social media, and concerned with brand values when making decisions make up the majority of this demographic, which generally has a medium spending power.

6.2.2. General Recommendations

Insights gathered throughout the research enabled the development of two key recommendations for any player in the industry, which will be discussed in detail below.

First Steps for Building a Consumer Decision Tree for the PBMA Category

Prior to entering a store, consumers typically have a specific need or product in mind. The results of the conjoint analysis provide a valuable insight for retailers in developing a consumer decision tree for the PBMA category. Consumer decision trees are “graphical records which assist manufacturers and retailers to understand consumer buying habits and the decision-making processes followed by individuals while shopping a category” (Byrne, 2020).

Results show that the significance of the added aroma attribute in the PBMA category was understood, yet its high importance appears to be due to consumers’ preference for options

without added aroma. Hence, the findings indicate that most consumers' first step when making a purchase decision in the PBMA category is to look for an unflavoured option. Although a study by Moss et al. (2022) confirmed that flavoured PBMA increased consumers liking of oat and almond-based beverages, further discussion with the group suggested that flavoured PBMA might satisfy a different type of need. In fact, one respondent from the preliminary interviews revealed that they preferred flavoured PBMA as a snack, especially "vanilla flavoured almond-milk", and often opted for flavoured drinks in small packages. This implies that flavoured PBMA satisfy a need for a specific moment, such as a morning or afternoon snack, without the accompaniment of anything else, such as coffee. Meanwhile, unflavoured PBMA may target a different need such as mixing it with coffee, cereal, oats, or for cooking purposes.

Consequently, researchers believe that the choice of added aroma is the primary decision that consumers make when considering a PBMA purchase. This insight can be useful for retailers when creating planograms "which group products in a logical and shopper friendly way" (Byrne, 2020), and create customer loyalty and increase sales by doing so.

Highlighting Health Labels on Packaging

A considerable lack of awareness about many aspects of plant-based beverage production, health benefits, and nutritional value has been observed among the Portuguese public (Pires et al., 2021). Given this finding, it is critical to not only promote clear and accessible information, but also to guarantee that consumers actively seek out and understand how to use it (Pais et al., 2023).

One recommendation is for brands to focus on their packaging and the information contained within it. Brands are advised to highlight health labels on packaging, such as nutri-score, no added sugars, gluten-free, and ecological production. These labels can attract health-conscious

consumers if strategically presented, as lengthy ingredient lists may make a product seem overly processed, less "natural", and deter potential consumers. Many plant-based products use additives to address sensory challenges, resulting in long lists of unfamiliar ingredients that can be perceived as highly processed and unhealthy by consumers (Giacalone et al., 2022). Therefore, it is suggested that brands opt for simple and recognizable ingredients to increase consumer trust and understanding of the product.

Given the perceptual map analysis results indicating that private-label brands are not perceived as transparent in presenting information and are not very bio and environmentally friendly, it is crucial for private-labels to leverage on these attributes to inform and attract consumers. It is important to note that health claims on food product labels can alter consumers' perceptions and influence their knowledge and behaviour, as well as impact company profits (Colby et al., 2010). Thus, emphasizing health labels and transparent ingredient lists on packaging can have significant effects on consumer behaviour and the success of a brand.

6.2.3. Brand-focused recommendations

Continente

Firstly, it is interesting to note that throughout the study it was found that Continente's private-label is leveraged in positive perceptions. From the perceptual analysis, it was concluded that Continente was able to compete with A-label brands on Health and a High Variety of Offer associations, exhibiting that a private-label brand could differentiate itself in these two points besides the price. Continente's private-label was undoubtedly better regarded in the eyes of respondents, compared to the private-label Pingo Doce. This can be justified by the fact that the private-label belonging to the SONAE group offers a greater variety of range of plant-based products, produces these products in Portugal, and develops healthier or nutritious products, which, as previously verified, is a motivation that highly leads consumers to opt for these

alternatives, in comparison with its direct competitor (the brand belonging to the Jerónimo Martins group). However, so that this difference is even more positive for the Continente brand, the group suggests that it communicate even more these competitive advantages that it has in comparison to Pingo Doce - for example, Continente can start by adopting Made in Portugal labels on its packaging (to attract the consumer's attention), and it can develop a section in its stores just dedicated to its private-label plant-based products (to make the consumer experience easier and more intuitive).

Secondly, and according to what was seen in the blind tasting that took place between Alpro and Continente, there are some strategies that Continente's private-label can adopt to become more competitive in relation to the A-label Alpro. As mentioned before, what Continente private-label lacks is building a brand image that delivers value to the consumer. Therefore, it is recommended that this brand invest in the construction/development of a more transparent one, to make the purchase process more intuitive and easier (for example, by improving the way it communicates the more technical terms/concepts associated with these products); expand and promote sustainable and horizontal development of this type of product, to demonstrate expertise, safety, and research in all the sensitive topics that this type of product often aggregates (for example, developing others plant-based products); present a more credible and reliable brand, fighting against the assumption that private-labels are associated with products with lower quality and more disadvantageous attributes for health (for example through the publication of scientific articles on the subject, proven publications in social media, the inclusion of food safety stamps and awards, among others).

Finally, considering that the private-label Continente is the brand umbrella of three private-labels that sell PBMA - Continente (sells PBMA with added aroma), Continente Bio (committed to PBMA with an organic certificate), Continente Equilíbrio (a sub-private-label that most

invests in these products and sells the remaining products in this category) - it is recommended to develop a reorganization of the category that further strengthens the Continente private-label as a whole. Thus, by combining the three Continente private-labels associated with PB products into a single brand, it would end up giving much more strength to this brand. In this way, in addition to making the buying experience for these products easier and more intuitive, the Continente brand of PB products would be in direct competition with Alpro, which allows for greater comparison and relationship between the brands.

Pingo Doce

Additionally, in the conjoint analysis, the "Non-private-label Shoppers" segment was created, a segment that is known for mostly including the Millennium generation and avoiding private-label PBMA. To attract this segment, the price is not enough. Private-label brands should offer and emphasize PBMA with oat and almond base ingredients, with no aroma and vanilla flavour, without added sugars.

Although the product attributes are important, this segment is also extremely influenced by the brand image and is present on social media. As so, creating an image around with what resonates with this target, aligning the brand's values with theirs, and understanding their motivations when purchasing, is indispensable.

Social media should be the main channel when communicating with the target audience. Not only should Pingo Doce want to raise awareness, but also, especially in this segment, want to increase brand attitude. Hence, communicating with them via this channel, Pingo Doce should work on creating positive emotions by emphasizing the previously mentioned attributes on their products. The base of the message should be focused on this segment's motivation to drink PBMA, the flavour preference, and how well the brand can do it in a unique way.

Additionally, in the extra analysis, many participants justified not trusting private-label brands due to the misinformation regarding the production process, quality certification, and ingredients origins. That way, to fight those barriers, Pingo Doce could place a QR code on their packaging ensuring that all information is readily accessible to consumers at any point in time.

Rude Health

According to what was verified throughout the study, it is possible to validate that Rude Health is a premium brand, based on positive associations, however, consumed only by a small group of participants. In this way, the group presents some strategies that the brand could adopt, to win over a greater number of loyal consumers while continuing with its premium positioning.

Firstly, and in line with what was found in the blind test to be an important factor for repeat purchases, the group suggests that this premium brand develops more brand activations in which it can prove its product to different consumers. Thus, after a good experience, Rude Health could win over some consumers who would previously be associated with other PBMA brands.

Secondly, practicality is something consumers across all FMCG categories increasingly value. Thus, and once again according to what was verified in the answers provided by the participants of the blind tests, it is suggested that Rude Health bet on the development of travel/small and practical packs that allow on-the-go consumption.

Finally, as it is a very expert and premium brand, with quality ingredients, the focus on consumer education can be something valuable for the brand. Thus, using its digital communities (Instagram and TikTok pages) through educational and informative content, Rude Health is able to open a space for sharing between the A-label and consumers, creating brand

awareness and showing its back-office production (for example, the brand took a long time to launch the almond drink because it was looking for the ideal production site).

6.3. Implications for future research

The limitations further discussed pertain to various constraints found by the researchers during the elaboration of the study, as well as implications for future research. Indeed, there were specific limitations scattered across more than one chapter of the study. The first limitation is related to the literature review, specifically the Portuguese market for PBMA and how little information is available that can be used to draw accurate conclusions – besides being scarce, most of the information was hard to prove, contrasting immensely with the availability of scientifically proven information on European and global markets of PBMA. Secondly, there were limitations on the preliminary research – for instance, during the stage of contact with professionals, only two out of sixty-five individuals contacted through LinkedIn agreed to engage in the surveys. Not only was the research limited because of low responses, but also due to possible partiality which could pertain to the specificity of the professional's function, the company they work for or even the amount of information that they were allowed to disclose. During the stage of interviews with consumers, the main limitations were the fact that the sample was composed mostly of female respondents, with the majority of the age group being 18-24 years old.

Moving on to the perceptual map analysis, limitations were mainly concerned with having a smaller sample size than expected which made it more difficult to draw insightful conclusions. More than that, the sample was almost completely dominated by female respondents, which is in agreement with the fact that women are more willing to engage and participate in research than men (Geisen et al., 2013). Also, the age distribution was found to be a limitation, since the survey was shared mostly through social media, resulting in the majority of the responses being

from the age range of 18-24 years old, while the percentage of respondents aged 35 to 44 and 55+ years old was much smaller in comparison. Another issue with most of the respondents is related to the fact that the majority of people belong to the researchers' network, therefore most of the respondents have a bachelor's or master's degree as their higher educational level. The same applies to the employment status.

Finally, limitations came up during the conjoint analysis. Firstly, the fact that the sample size was greatly reduced at the beginning of the survey due to the target's profile, resulting in a smaller sample size and more difficulty in drawing conclusions, due to low-quality responses. The small sample was also limitative since it contributed to assumptions such as normally distributed data, homogeneity of variances, independence between variables and random sampling to be put into question. In addition, the limitations regarding the demographics of the participants were the same as in the Perceptual Map analysis. Additionally, the researchers highlight that during the elaboration of the conjoint analysis survey, the added aroma should not have been a factor taken into consideration. Since the general consumer profile analysed in this study tends to strongly prefer no added aroma, to help prevent the skewed results obtained, this attribute should not have been considered. Another limitation pertains to the Marginal Willingness to Pay - even if it is an informing tool for pricing and the decision-making process, there are other factors such as production costs, competition, and overall market demand that need to be considered, otherwise the MWTP is limitative by itself. Additionally, the researchers did not ask for the household size, but rather for the monthly household income – this constitutes a limitation, because respondents that make no earnings per month responded according to the income earned by the other members of the household, and ultimately it became impossible for the researchers to derive the real purchasing power of each respondent. Moreover, regarding the motivations section of the conjoint survey, instead of asking participants to select their main motivation for the consumption of PBMA, the researchers opted

for a point allocation scheme. This method made it impossible to connect the Conjoint Analysis results with the motivation section. Moreover, choice-based conjoint has proven that consumers make choices based solely on the attributes that they are presented with, weighing each attribute separately, although in real life, the decision-making is much more difficult and complex, being influenced by topics such as personal preferences, context, among others.

Moreover, there is one limitation related to the Perceptual Map and the Conjoint Analysis – the potential of measurement error. While it is true that both approaches are often employed to study consumer behaviour, it might so happen that these do not capture the full spectrum of factors that influence consumer's decision-making. For instance, individuals may base their judgement on emotional factors such as personal values or their social identity – these are not as easy to quantify using the approaches mentioned above. More than that, respondents were expected to respond according to past experiences and according to their memory, bringing forward one more limitation to the study – the recall bias.

In regards to the extra analysis, no major conclusions were drawn due to the sample's small size – this limitation implied a size so small that it could not be significant in terms of results.

Furthermore, it is important to point out that, in the decision instant, the displayed products on shelves can vary. This is because there are many external factors that influence the store where the purchase is being made such as familiarity, trust, and mostly location – the closer to the consumer's residence, the better. If a consumer goes to Continente, for example, Pingo Doce private-label products will not be offered, and vice-versa. Additionally, if a consumer opts for a smaller Pingo Doce or Continente convenience store, brands like Oatly and Rude Health will most likely not be available, due to lower demand. Given the limitations referred above, and considering the entirety of the study, the results may not be generalizable to the Portuguese population as a whole.

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Appendix

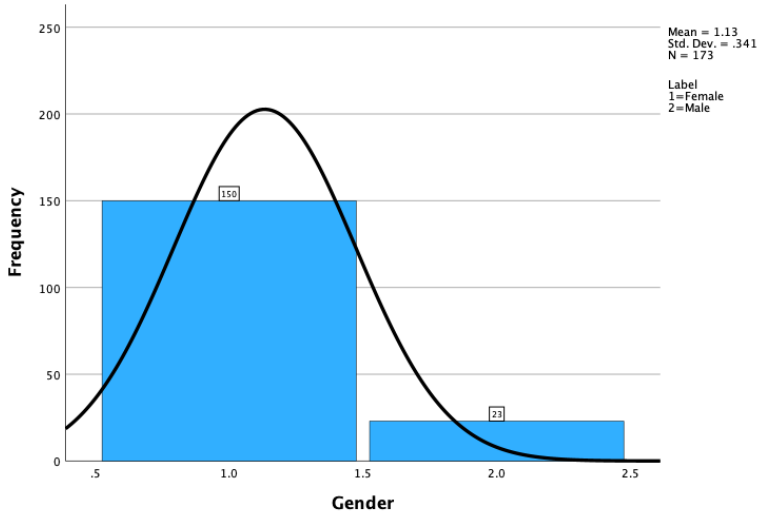

Figure 7. Consumers frequency distribution by gender

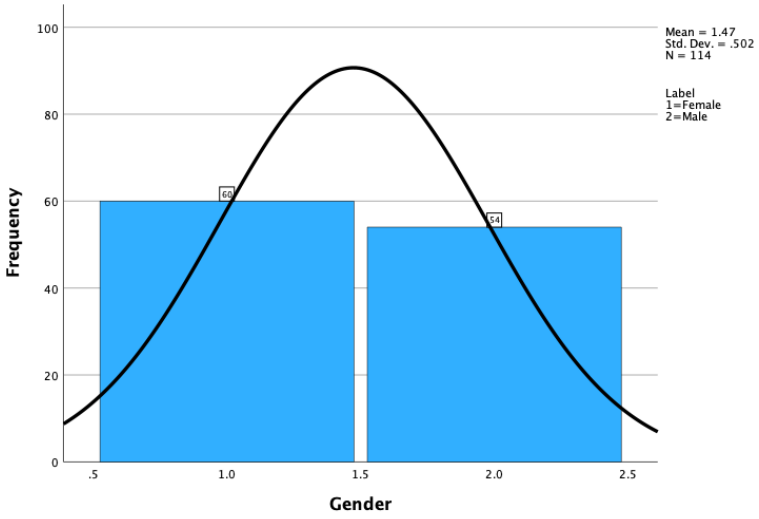

Figure 8. Non-consumers frequency distribution by gender

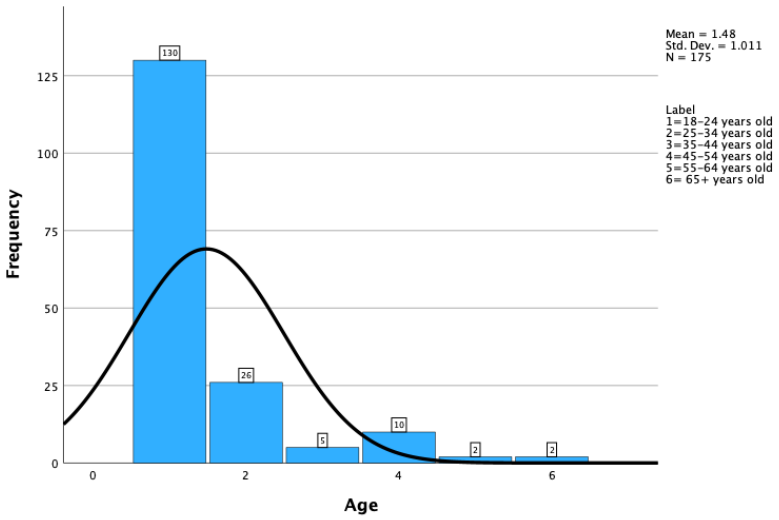

Figure 9. Consumers frequency distribution by age

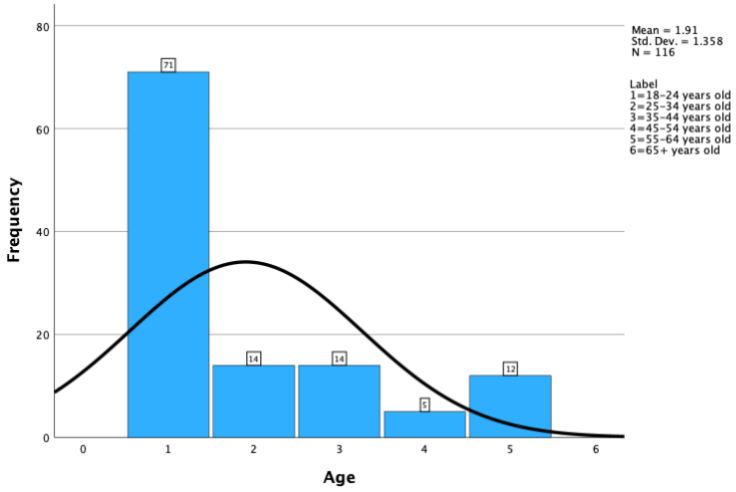

Figure 10. Non-consumers frequency distribution by age

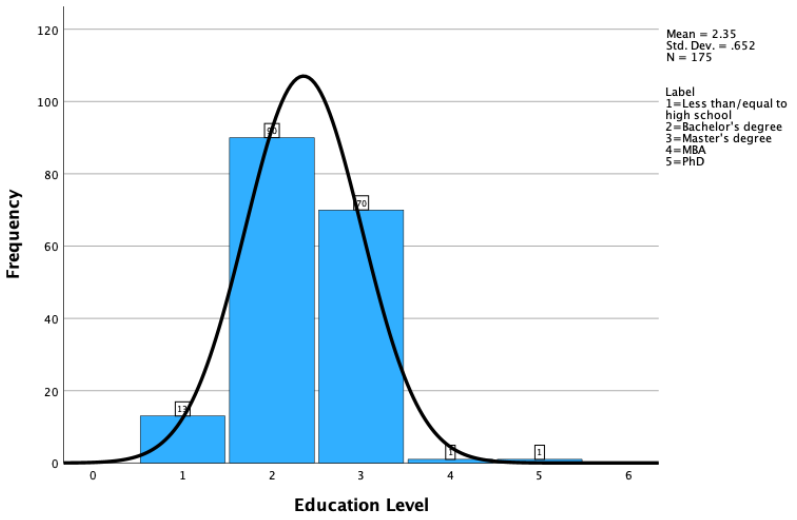

Figure 11. Consumers frequency distribution by education level

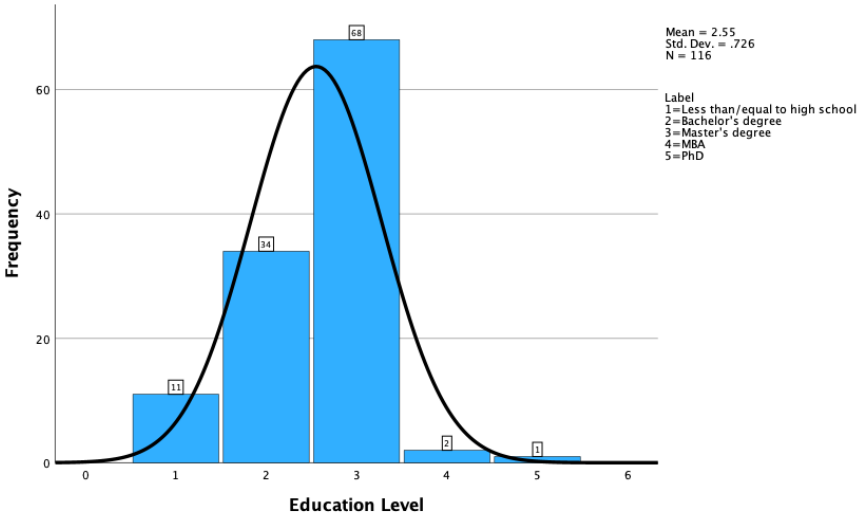

Figure 12. Non-consumers frequency distribution by education level

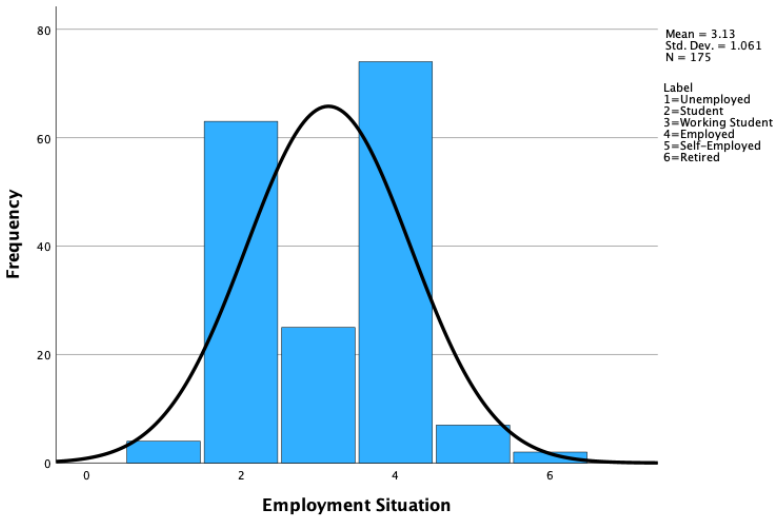

Figure 13. Consumers frequency distribution by employment situation

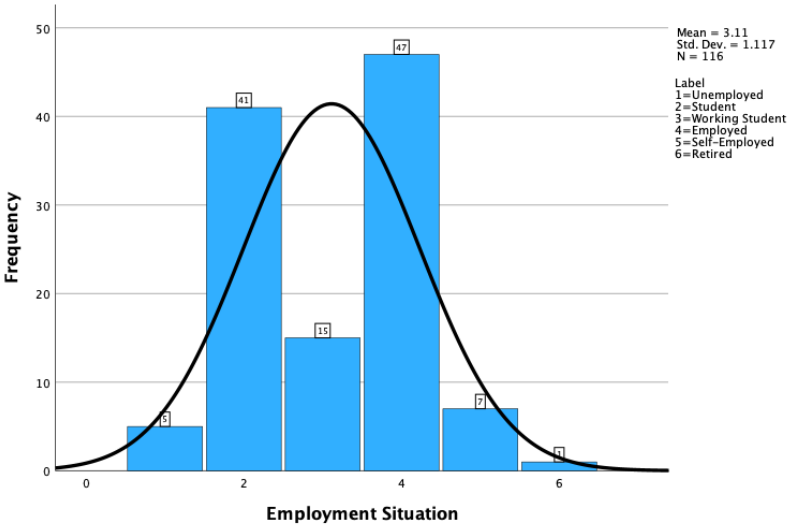

Figure 14. Non-consumers frequency distribution by employment situation

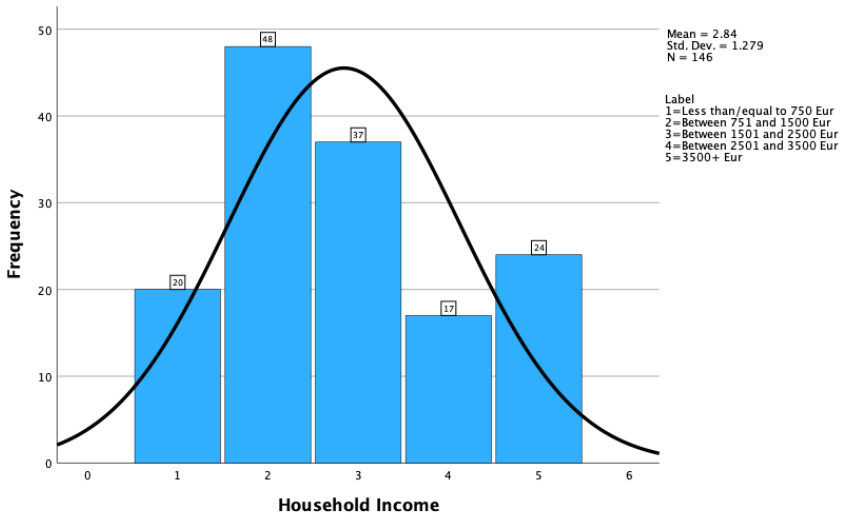

Figure 15. Consumers frequency distribution by household income

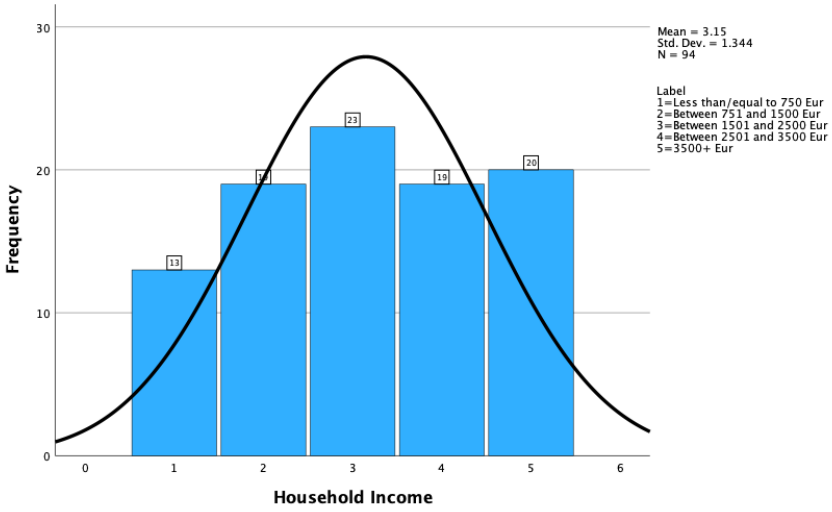

Figure 16. Non-consumers frequency distribution by household income

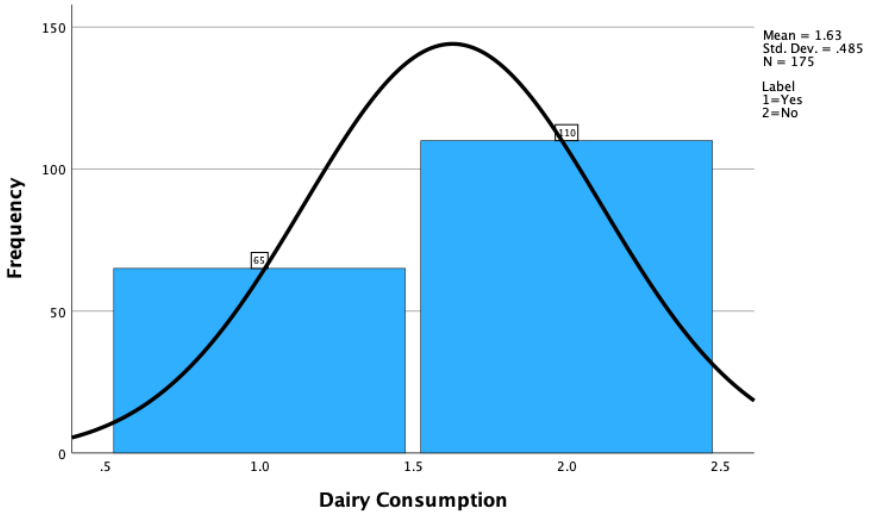

Figure 17. Consumers' frequency distribution of dairy consumption

Barriers to consume PBMA	***Absolute Frequency***
Prefer cow milk	32
Dislike PBMA taste	30
Do not consume milk	21
No interest in trying PBMA	13
PBMA are too expensive	8
Cow milk is more nutritional	7
Family tradition	3

Table 3. Non-consumers barriers frequency in absolute values

Brands	***Absolute Frequency***	***Relative Frequency***
Alpro	173	98.9%
Continente	101	57.7%
Pingo Doce	94	53.7%
Oatly	80	45.7%
Shoyce	74	42.3%
Rude Health	70	40.0%

Table 4. Consumers relative and absolute frequency distribution per brand

Total Variance Explained

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	7.234	80.375	80.375
2	1.124	12.485	92.859

Extraction Method: Principal Component Analysis.

Table 5. Total variances explained by 2 components

Component Matrix[a]

	Component	
	1	2
Info_Transparency	.971	.230
High_Quality	.967	-.213
Bio	.922	.085
Trendy	.919	-.385
Expensive	.916	-.327
Savoury	.915	-.102
Environm_Friendly	.911	-.245
High_Variety_Offer	.800	.498
Healthy	.715	.667

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Table 6. Correlation of attributes by 2 component matrix

Correlation Matrix[a]

		Healthy	High_Quality	Info_Transparency	Expensive	Environm_Friendly	Bio	Trendy	High_Variety_Offer	Savoury
Correlation	Healthy	1.000	.546	.838	.446	.497	.763	.416	.852	.533
	High_Quality	.546	1.000	.894	.931	.891	.896	.975	.648	.946
	Info_Transparency	.838	.894	1.000	.813	.823	.902	.801	.903	.879
	Expensive	.446	.931	.813	1.000	.988	.760	.964	.611	.795
	Environm_Friendly	.497	.891	.823	.988	1.000	.745	.924	.667	.752
	Bio	.763	.896	.902	.760	.745	1.000	.840	.658	.860
	Trendy	.416	.975	.801	.964	.924	.840	1.000	.518	.871
	High_Variety_Offer	.852	.648	.903	.611	.667	.658	.518	1.000	.680
	Savoury	.533	.946	.879	.795	.752	.860	.871	.680	1.000

a. This matrix is not positive definite.

Table 7. Correlation between the different attributes

Brands	*X-axis*	*Y-axis*
Alpro	0.57912	-0.23259
Shoyce	-0.31587	0.67883
Rude health	1.57426	0.59586
Oatly	0.07084	-1.85075
Pingo doce	-1.31515	-0.03030
Continente	-0.59320	0.83895

Table 8. Coordinates in the perceptual map by brand

Alpro	0,99 €	1,74 €	2,49 €	**Baseline**	3,24 €	3,99 €	PED
	38,8%	29,6%	23,7%	23,1%	20,0%	17,7%	-0.6

Continente	0,99 €	**Baseline**	1,74€/L	2,49 €	3,24 €	3,99 €	PED
	29,6%	27,4%	19,4%	13,0%	9,8%	8,4%	-0.9

Pingo Doce	0,99 €	**Baseline**	1,74€/L	2,49 €	3,24 €	3,99 €	PED
	19,2%	17,3%	11,3%	7,3%	5,6%	4,7%	-1

Rude Health	0,99 €	1,74 €	2,49 €	**Baseline**	3,24 €	3,99 €	PED
	19,6%	12,2%	8,8%	7,8%	7,2%	6,6%	-0.8

Shoyce	0,99 €	1,74 €	**Baseline**	2,49 €	3,24 €	3,99 €	PED
	17,6%	11,4%	9,3%	8,3%	6,7%	6,0%	-0.8

Oatly	0,99 €	1,74 €	**Baseline**	2,49 €	3,24 €	3,99 €	PED
	20,5%	13,1%	9,8%	9,4%	7,7%	7,0%	-0.8

Table 9. Preference Shares for different price-points and Price Elasticity of Demand

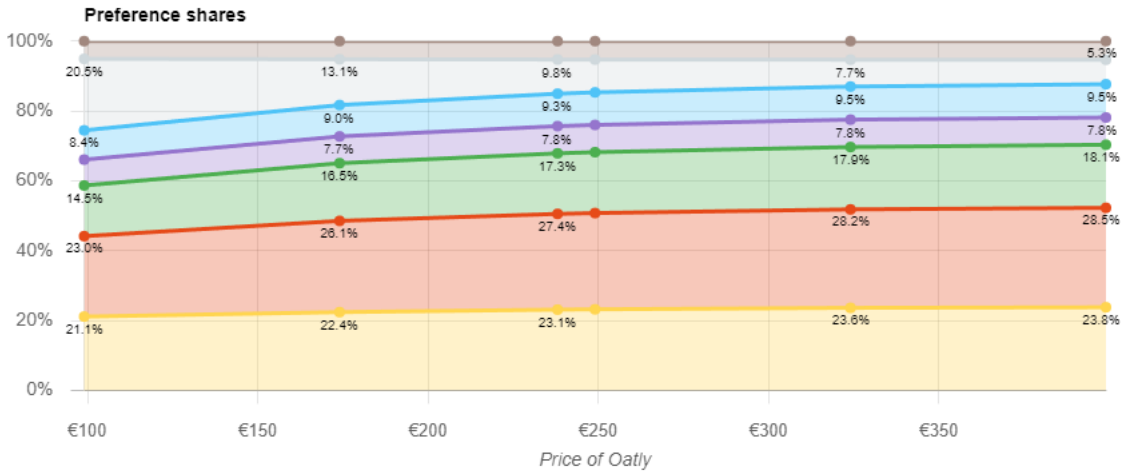

Figure 18. Preference Shares according to different price-points for Oatly

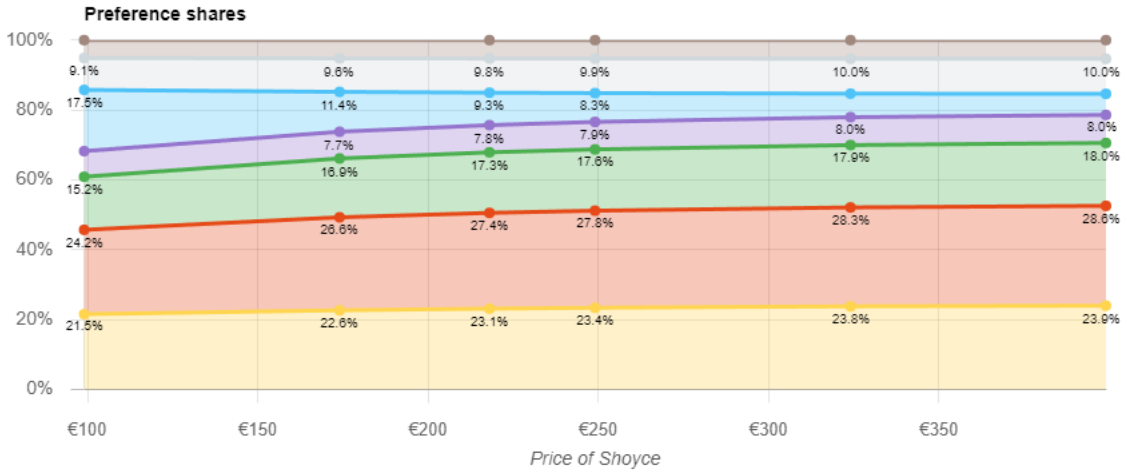

Figure 19. Preference Shares according to different price-points for Shoyce

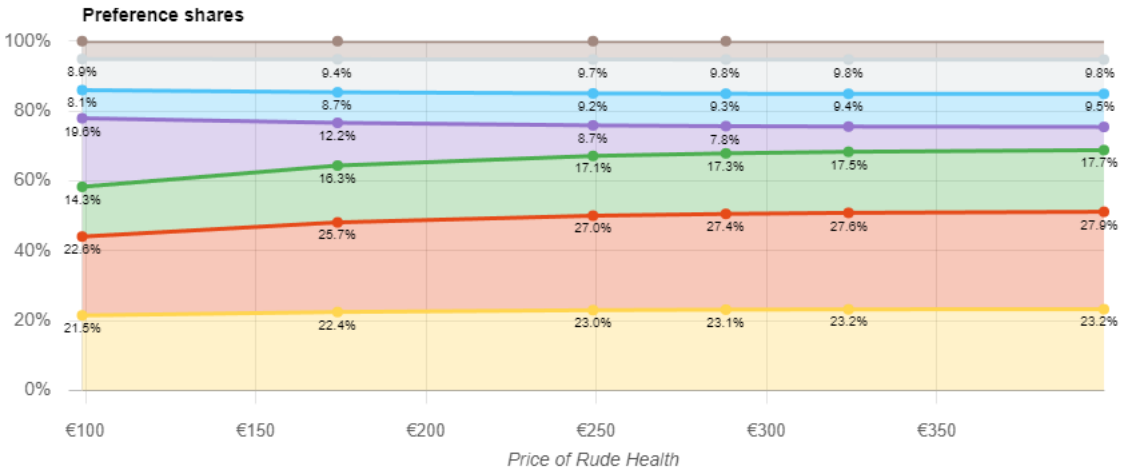

Figure 20. Preference Shares according to different price-points for Rude Health

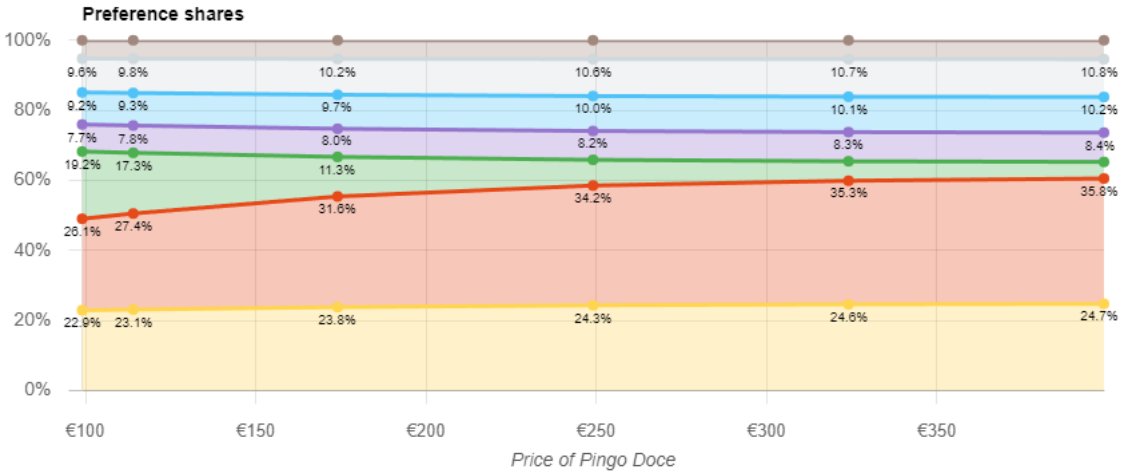

Figure 21. Preference Shares according to different price-points for Pingo Doce

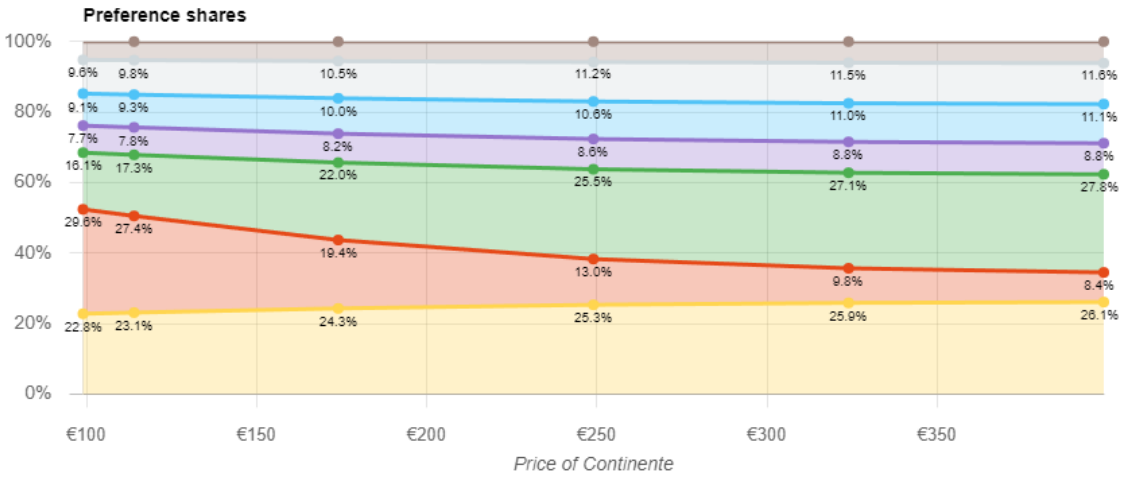

Figure 22. Preference Shares according to different price-points for Continente

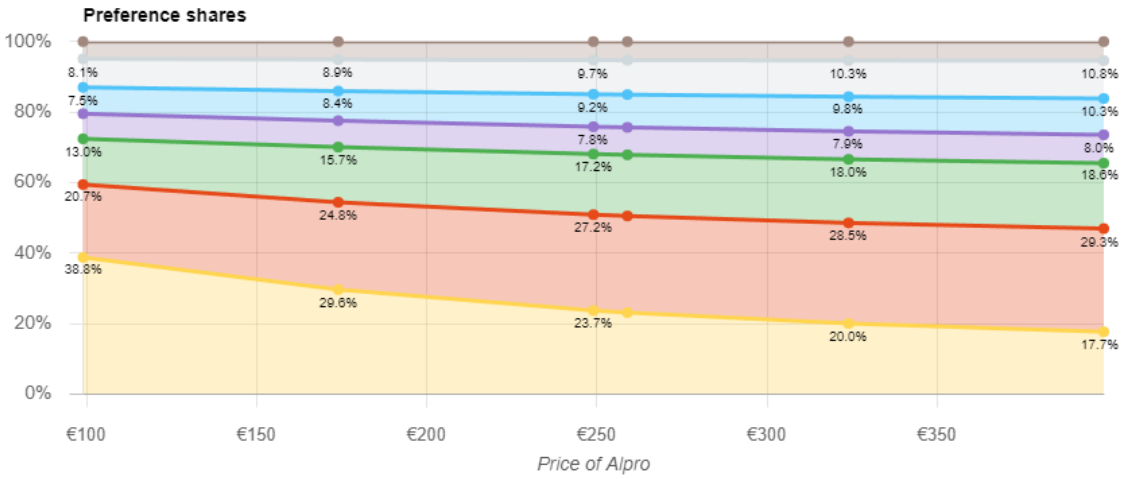

Figure 23. Preference Shares according to different price-points for Alpro

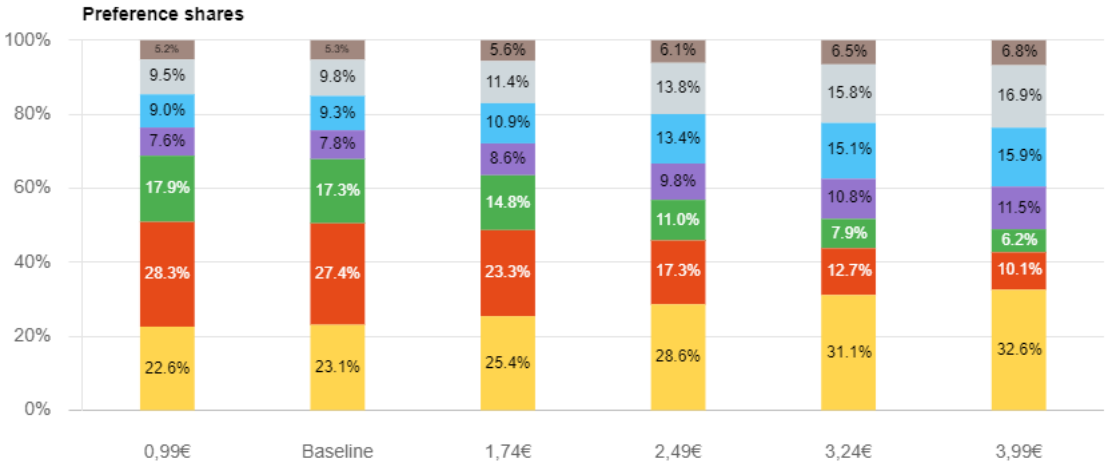

Figure 24. Preference Shares in Oat Market with increasing private-label's price

DEMOGRAPHICS					QUESTION 1	QUESTION 2	QUESTION 3	TASTE TEST	QUESTION 4
Gender	**Age**	**Education Level**	**Employment Situation**	**Hh Income**	**Says that prefers:**	**Why do you chose that brand??**	**2. If both were at the same price, which would you choose?**	**Chooses:**	**What is miss on the non-chosen one?**
Male	[55-64] years old	MBA	Employed	[2500-3500] Eur	Alpro	"Apro is a trusted brand. It only produces products of this kind, while the Continente sells many other products. In terms of food safety, I feel safer. It is an autonomous brand that takes responsibility. The Continente is an intermediary, I don't know the criteria."	Alpro	Alpro	"The Continent lacks to highlight where it is manufactured, its origin (manufacturer). Be transparent at that level. Additionally, mention that it is a national product! Alpro is French, I would think more about my choice"
Female	[25-34] years old	Master	Employed	[1500-2500] Eur	Continente	"Because of the lower price has small packages for PBMA with many different ingredients (I live alone and do not usually consume a lot)"	Alpro	Continente	"Small packages. Moreover, I see Alpro as a reliable market specialist. I've also tasted other products of the brand that I really liked"
Female	[55-64] years old	Bachelor	Retired	[1500-2500] Eur	Continente	"Price is very important in my choice. Apart from that, I would have chosen Alpro. I think the whole manufacturing process has more quality criteria"	Alpro	Alpro	"Alpro should reduce the price. I'd be willing to give more money, but sometimes it manages to be almost double that of a white label"
Female	[18-24] years old	Master	Student	<750	Alpro	"Because I've already consumed some Alpro products, namely the almond yogurts and I loved it. At the time I only chose alpro because there was no other cheaper options available in the market. So I see Alpro as a reliable brand, I know that I will like the taste, although the price is higher"	Alpro	Alpro	"If I consumed it more often, no doubt that it would go to the mainland, it is cheaper. I also liked that there were yogurts and maybe I made that association right away and ended up consuming more times"
Female	[18-24] years old	Bachelor	Employed	[750-1500] Eur	Alpro	"Quality"	Alpro	Alpro	"Change the brand image"
Male	[18-24] years old	High school	Employed	<750	Continente	"Cheap and good"	Continente	Alpro	"Small packages, a lower price and a milder taste"

Female	[18-24] years old	Master	Employed	[1500-2500] Eur	Continente	"I relate Alpro to plant products. Specialized"	Alpro	Alpro	"More affordable prices"
Male	[18-24] years old	Master	Student	<750	Alpro	"Alpro invests more in research, they know how to use ingredients better"	Alpro	Continente	"More information"
Male	[18-24] years old	High school	Employed	<750	Alpro	"It has an appealing design, more credible and has been consuming for some time"	Alpro	Alpro	"Change the brand image. Maybe use a more appealing name"
Male	[18-24] years old	Master	Student	<750	Continente	"I like white label products, and they usually have a less strong flavor than PMAs"	Continente	Continente	"Lower the price. It's a giant barrier for me, I end up not experiencing it"
Female	[45-55] years old	Bachelor	Employed	3500+	Alpro	"I don't know the products of the continent, so I trust Alpro more. I've tried it and liked it"	Alpro	Alpro	"I have nothing against white labels. In fact, I usually consume the drinks of pingo doce because they are the ones that have the least ingredients. That's super important to me. I found the taste of the continent unpleasant"
Female	[18-24] years old	Master	Employed	[1500-2500] Eur	Continente	"It tastes better, but it's more liquid. In addition, price is a decisive factor"	Continente	Continente	"The taste should be better, and the price should be more adjusted to a product that often belongs to one capable of essential goods."
Female	[18-24] years old	Master	Employed	[750-1500] Eur	Alpro	"I chose Alpro because in addition to being an expert brand in this type of products (something that gives me confidence in consumption), the taste also seemed better to me"	Alpro	Alpro	"In fact I think that white labels should be more informative - that is, through all the forms of communication that the brand has"
Male	[25-34] years old	Bachelor	Employed	[750-1500] Eur	Alpro	"I always grew up in an environment where healthy eating was a reality! And Alpro has always been a brand present in my family environment. In this way, the taste of Alpro is something that I am familiar with"	Alpro	Alpro	"I think consumers see white labels as lower quality products! In this way, I believe that the Continent should bet on demonstrating to consumers that they also have expertise in this subject."
Female	[18-24] years old	Bachelor	Student	<750€	Alpro	"I was born with an autoimmune disease, which made me always have to opt for PBMA. In this way, I always grew up consuming Alpro, since it was the most reputable brand on the market."	Alpro	Alpro	"Show consumers your expertise! Develop a greater buzz around this type of products in order to show that you also know what you are doing!"

Figure 25. Extra analysis survey and blind test results