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The key factors shaping dog food purchases in Portugal:

The Dog Food Market in Portugal: Perceptual Mapping: Analysing Consumer Perceptions of Dog Food Brands

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Abstract

This thesis explores Portuguese consumers' preferences for dog food, focusing on availability, health benefits, organic quality, price, and sustainability. Through interviews, perceptual mapping and conjoint analysis, price emerged as the most influential factor, with younger, eco-conscious consumers prioritizing health benefits and sustainability. Royal Canin leads in scientific innovation, while Advance and Purina struggle with differentiation. PorSi's value-for-money positioning is hindered by low trust and appeal. The ideal product – available, affordable, health focused, organic and sustainable - remains unavailable, as consumers expect high quality at the lowest price. This research reveals an opportunity for pet food brands to meet consumer expectations.

Keywords

Dog food industry, Purchase patterns of consumers, Pet food, Organic ingredients, Nutritional worth, Environmentally friendly, Current patterns in the market, Perception of a brand, Portugal's pet food industry

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List of Abbreviation

AI	<i>Artificial Intelligence</i>
AHP	<i>Analytical Hierarchy Process</i>
AR	<i>Attribute Rating</i>
CAGR	<i>Compound Annual Growth Rate</i>
CBC	<i>Choice Based Conjoint</i>
e.g.	For example (Lat: <i>exempli gratia</i>)
et al.	<i>And others (Lat: et alia)</i>
ML	<i>Machine Learning</i>
NPD	<i>New Potential Product</i>
OS	<i>Overall Similarity</i>
PCA	<i>Principal Component Analysis</i>

1. Introduction

The pet food industry has undergone significant growth in recent years, driven by shifting consumer attitudes and increased pet ownership worldwide. Despite economic challenges as the COVID-19 pandemic, the sector demonstrated resilience, adapting to new demands, and maintaining a steady trajectory of growth (Pet Industry Data Book 2023). Portugal is no exception to this trend, as the Portuguese Animal Information System (SIAC) reported that the country currently has over 4.19 million registered dogs, of which over 3 million are canines (Global PETS 2024). This rise indicates a significant increase in pet ownership, as well as the growing importance of pets as integral members of households (Global PETS 2024).

While global research has provided insights into consumer behaviour and market positioning within the pet food industry, remains a gap in research that specifically focuses on Portugal's dog food markets. This thesis aims to address this gap by investigating the preferences of Portuguese consumers and the alignments with the offerings of key industry players such as Advance, PorSi (Intermarche's brand), Purina, and Royal Canin. The goal is to explore how factors such as product availability, health benefits, organic quality, sustainability, and price influence consumer choices.

Millennials and Gen Z increasingly base pet food choices on sustainability (LEK Consulting 2024). A recent Euromonitor International survey showed that, normally, pet owners are more concerned about climate change and actively pursue "green activities" to improve the environment, than non-pet owners (Euromonitor International 2024; Interzoo 2024). Consumer concern for sustainable pet food drives production, packaging, ingredient choices, as well as marketing. The 2023 EuroPet Market Trends survey showed that 64% of EU pet food consumers prefer paying more for products in biodegradable or recyclable packaging. This thesis explores how sustainability importantly influences Portuguese dog food consumer preferences and behaviour. Therefore, in this thesis, sustainability is regarded as one of the key

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factors influencing consumer preferences in the Portuguese dog food market, and this study will explore in depth how sustainability affects consumer behaviour in the Portuguese dog food market.

Furthermore, such research ideally suits Portugal's demographic and socioeconomic landscape. Portugal's unique demographic and socioeconomic landscape make it an ideal setting for such research. The country has seen a rise in urbanization and shifts in family structures such as smaller households and delayed parenthood, leading to increase reliance on pets for companionship (Torres 2022). Younger generations, specifically Millennials (born 1981-1996) and Gen Z (born 1997-2012) are leading the way in pet ownership, accounting for 33% of pet owners (Forbes 2024). This shift has fuelled demand for premium health-conscious pet products that reflect care and quality (Pet Industry Data Book 2023). Portugal's market dynamics mirror global trends while offering unique regional insights, making it a valuable yet under-research markets compared to larger countries (Pet Industry Data Book 2023). Therefore, exploring consumer preferences, in Portugal, provides an opportunity to understand both evolving local needs and broader global patterns.

The study adopts a mixed-methods approach, combining perceptual mapping and conjoint analysis. These methods allow for detailed exploration of how consumers perceive competing brands and the trade-offs they make when choosing dog food. Perceptual mapping will visualize the positioning of brands into the consumers mind, relative to one another, based on key attributes. While conjoint analysis, will evaluate consumer preferences for specific product features. This comprehensive methodology enables an understanding of consumer decision making and processes, helping brands adapt their strategy to better meet market demands.

This thesis is structured to provide a cohesion exploration of Portuguese dog food markets. Following this introduction, a literature review will examine existing studies and consumer behaviour, brand positioning and trends within the pet food industry while identifying relevant

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gaps in Portugal. The research questions section outlines the specific factors under investigation, such as price sensitivity, health concerns and sustainability. The methodology section details the data collection and analysis techniques employed, while the discussion section presents findings and their implications for brands operating in this market. Finally, the thesis is concluded with practical recommendations for industry player and suggestions in future research.

2. Perceptual Map

2.1. Objectives Of The Perceptual Map

Perceptual mapping is applied across various marketing research, helping to bridge complex data with practical business application. Gigauro (2019, 45) identified the perceptual mapping as a valuable technique for translating consumer perception into a visual form, which helps in simplifying the interpretation and application in real-world scenarios. This tool is commonly used by both academic researchers and industry professionals, as it offers insight into market segments and identifies opportunities for innovation and differentiation (Gigauro 2019, 45).

In practice, businesses leverage Perceptual Map to uncover gaps in the market, identifying unmet consumer needs and spot strategic opportunities for entering new markets and repositioning existing product. This is especially useful in competitive environment, with low competition or to differentiate a product (Gigauro, 2019). By transforming raw data into actionable insights, perceptual maps help industries make more effective and informed strategic decisions.

The two common approaches are the Attribute Rating Method (AR) and the Overall Similarity Method (OS) (Dillon et al. 1990). The first mentioned method consists of consumers evaluating brands or products taking into considerations different attributes, for example, price, design, subscription model, quality, and others (Dillon et al. 1990). Conversely, the Overall Similarity Method shifts the focus away from specific attributes, instead focus on the consumer evaluation concerning the overall similarity or dissimilarity between brands (Dillon et al. 1990). This method is particularly useful when the research seeks to understand holistic perceptions, especially when the key differentiating attributes cannot be explicitly identified (Dillon et al. 1990).

For this thesis, the Attribute Rating Method (AR) was chosen as the most suitable approach. This method enables the construction of perceptual maps that illustrate how consumers perceive dog food brands. By evaluating specific brand attributes such as science-based, trustworthy, and informative, this approach provides insight into the positioning of these brands in the minds of consumers. The Attribute Rating Method is particularly appropriate for this thesis, as it facilitates a structured analysis of the attributes defining the brands, thereby, contributing to a deeper understanding of consumer perceptions and behaviour within the dog food market.

2.2. Design Of The Perceptual Map

To obtain valuable insights about how consumer perceive the selected dog food brands within the Portuguese market, we created a survey using Google Forms. Google Forms is a versatile and user-friendly tool which enables researchers to design surveys efficiently. Its features make it possible to quickly formulate questions within different sections, customize diverse response types, and disseminate the survey easily across several channels, including social media and email. Additionally, one of Google Forms' many notable features is the ability to transfer collected data to Google Sheets. This smooth integration makes data analysis and computations easier, allowing us to focus more on understanding the results rather than manually handling data. (Hsu and Wang 2017).

The survey was organised into different sections (Figure 16, Appendix). The first section is dedicated to screening questions, which were designed to qualify respondents. Participants were first asked if they currently own a dog or had owned one recently, if they answered negatively, their participation was immediately terminated. Subsequently, respondents were questioned if they usually buy dog food in Portugal. Those who say that they

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do not purchase dog food in the country were also directed to conclude the survey. These screening questions were essential in reducing the sample size and guaranteeing that only those with relevant and firsthand experience in buying dog food were included in the data collection. This approach is crucial to improving the validity and reliability of our findings.

In the second section of the survey, titled "Brand Familiarity and Attribute Ratings," only respondents who met the screening criteria by answering "yes" to both initial questions were invited to participate. This section began by assessing participants' familiarity with four selected dog food brands: Advance, PorSi, Purina, and Royal Canin. Evaluating brand familiarity was a critical step, as it provided essential context for interpreting the subsequent ratings of specific brand attributes. Participants were then, asked to evaluate each brand based on a series of defined attributes. For each attribute, a question was presented, and responses were collected using a five-point Likert scale. According to Carifio and Perla (2007), the five-point Likert scale effectively captures the intensity of respondents' ideas, allowing for a more nuanced analysis of consumer impressions. A strong negative association with the attribute is represented by a score of 1, and a significant positive association is represented by a score of 5. The structured approach of this section sought to guarantee a thorough and consistent comprehension of customer perceptions, which would subsequently be used to build the perceptual map.

2.3. Description Of The Perceptual Map Attributes

2.3.1. Science-Based Production

This attribute was included to assess how consumers perceive how much a brand relies on scientific knowledge and research, when developing new products. Science-based production, which is frequently associated with rigorous nutritional research and veterinary approval, is a sign of legitimacy and quality in the pet food sector (World Small Animal Veterinary Association 2021). By evaluating this attribute, we sought to understand how consumers associate each brand with scientific rigor, which plays a fundamental role in positioning brands as trustworthy and health oriented.

2.3.2. Innovation

Thanks to advancements in product formulations and variations, the pet food sector has seen significant development. According to Kumar et al. (2024) an increase in the global dog population has prompted improvements in commercial pet foods, with diets catered to different sizes, life stages, and specific breeds. This trend highlights the importance of innovation in meeting diverse nutritional needs and consumer preferences. By integrating this attribute into our analysis, we can gain a thorough grasp of how consumers perceive a brand's ability to adapt and lead in a dynamic market.

2.3.3. Premium

Incorporating the 'Premium' attribute is essential for understanding consumer perceptions of high-end or luxurious pet food brands. This attribute encompasses factors such as price, quality, and exclusivity, which significantly influence purchasing decisions. Research highlights that pet owners are demonstrating a higher desire to spend money on high-quality

products that improve their pets' health and well-being, which is driving a growing trend of premiumization within the pet food market, (Pet Food Industry 2020). This shift reflects the broader humanization of pets, as owners seek high-quality, often human-grade ingredients for their companions (GfK 2017).

2.3.4. Nutritive Balanced

This attribute focuses on the perception of how well a brand's products are developed to give dogs a full and well-balanced diet. This attribute is considered as a fundamental factor for pet owners who prioritise their pets' health and nutrition, as it reflects the adequacy of essential nutrients in the diet. According to a study by Poocharoen (2017), healthiness is one of the key factors influencing consumers' purchasing decisions for dog food, which may indicate that pet owners highly value products that contribute to their pets' well-being. By including this attribute, we expect to determine whether consumers believe that each brand satisfies basic nutritional requirements and norms.

2.3.5. Trustworthiness

Trustworthiness is an integral component of brand perception, particularly in the pet food industry, where safety and reliability are paramount. (Food Industry Executive 2020). This attribute was included to assess the degree to which consumers feel confident about the quality and integrity of a brand.

2.3.6. Attractiveness

Attractiveness pertains to the visual and aesthetic appeal of a brand's packaging and marketing materials. Visual appeal significantly influences initial consumer impressions, which

can affect overall brand evaluation and purchasing decisions. Research indicates that attractive packaging design positively impacts consumers' willingness to pay and enhances perceived brand image, underscoring the importance of visual elements in consumer behaviour (Morgunova and Tu 2017). By including attractiveness, we aimed to understand whether consumers associate each brand with appeal and market presence.

2.3.7. Reputation

Reputation is a critical attribute that captures consumer opinions, brand history, and market standing. A strong reputation often reflects consistent quality, customer satisfaction, and positive word-of-mouth (Sweeney and Swait 2008). Including this attribute helps explore how consumers perceive brand's legacy and overall image.

2.3.8. Informative

The information attribute assesses the extent to which brands provide clear and accessible details about their products, such as ingredients, nutritional content, and usage instructions. Transparency and communication are key factors in consumer decision-making. A study has shown that detailed product descriptions, positively affect consumer perceptions and willingness to purchase (Wang et al. 2021). In the context of pet food, providing accessible information about ingredients and nutritional value is increasingly critical, as pet owners are highly attentive to the health implications of their purchasing decisions (Kemp et al. 2017). This attribute was included to determine whether consumers perceive certain brands as transparent and informative.

2.3.9. Flavour Variety

Flavour variety represents the diversity of options a brand offers to cater to different preferences and needs. Research indicates that palatability, influenced by flavour variety, plays a crucial role in pet food acceptance and preference. A study by Watson et al. (2023) highlights that the sensory characteristics of pet food, including flavour, directly impact a pet's willingness to consume the product, thereby affecting overall satisfaction and adherence to a particular diet.

From the pet owner's perspective, offering a diverse flavour portfolio allows for personalised feeding strategies, aligning with the humanization trend in pet care, where owners seek to provide varied and enjoyable meals for their pets. This approach not only enhances the pet's eating experience but also strengthens the emotional bond between the pet and owner, as owners perceive that they are catering to their pet's individual preferences (Dotson and Hyatt 2008). Including this attribute allows us to explore whether consumers associate specific brands with flexibility and customisation, which can enhance their appeal by addressing individual pet tastes and dietary requirements (GfK 2016; Lummis 2017).

These attributes collectively represent a comprehensive framework for understanding consumer perceptions of each brand. They were chosen to capture the multifaceted ways in which consumers evaluate and differentiate dog food brands, providing a robust foundation for constructing perceptual maps.

2.4. Data Collection Of The Survey

The survey was made available for responses for a period of one week, to ensure that as much data could be gathered. By realizing the probable linguistic barriers among respondents, we developed two versions of the survey - one in English and another in Portuguese. This approach was strategically implemented to accommodate participants who may not be proficient in English, increasing our reach within the target audience and

guaranteeing inclusivity. By providing both language options, we aimed to gather information that authentically represented the opinions of Portuguese dog owners. To reach a wide range of people, the survey was distributed using a multifaceted approach. Distribution channels included WhatsApp groups, social media platforms such as Instagram and Facebook, and personal contacts. We received 54 completed responses in total, 7 of which were in English and 47 of which were in Portuguese. After analysing the information gathered, we discovered that three participants owned a dog, but they did not buy dog food in Portugal, and four people did not currently own a dog. These responses were excluded from the analysis, to maintain the validity and relevance of the data. Consequently, our analysis focused on the 47 valid responses from participants, who qualified as dog owners actively purchasing dog food, in the country (n=47).

2.5. Results Analysis Of The Perceptual Map

2.5.1. Demographic Results Analysis

As previously detailed in the demographic chapter, we incorporated questions regarding the demographic profile of our respondents, including their age, occupation, and income.

Age (Figure 9, Appendix)

The largest segment of respondents, representing 40% of the total, was aged between 16 and 27 years. This group primarily comprises young adults, who are typically more digitally connected and socially engaged. The age group of 28 to 43 years constituted 15% of the sample. These individuals are often in mid-career stages or family-building phases, balancing professional responsibilities with personal commitments, positioning them as a key demographic for products that cater to efficiency and practicality. Respondents aged 44 to 59 years accounted for 34% of the respondents, making this the second-largest segment in the sample. This group generally includes experienced professionals, their established careers and lifestyles often translate into stable and consistent decision-making patterns. The 60 to 78-year

age group represented 11% of the respondents. Individuals in this category are often retired or approaching the end of their professional careers. No respondents fell into the above-78 age group, resulting in 0% representation. This absence could be attributed to the lower likelihood of technology use and participation in online surveys among this demographic, highlighting a limitation in capturing their perspectives within the study.

The sample composition reflects a broad and representative cross-section of the population relevant to this study, capturing key age demographics that are likely to influence consumer behaviour.

Occupation (Figure 10, Appendix)

The sample was well-distributed across occupational categories, ensuring a comprehensive understanding of the respondents' roles in the Portuguese dog food market. Students accounted for 23% of the sample, highlighting the importance of younger consumers in this market segment. This group typically faces financial constraints and less responsibility in deciding which food to purchase for their pets. Full-time employees represented most respondents, making up 57% of the sample. This group is likely characterised by higher disposable incomes and probably a higher focus on quality and convenience. Part-time employees comprised 13% of the respondents, reflecting a mix of financial constraints and more flexible time availability. These factors may shape their purchasing preferences and behaviours, potentially leaning towards products that balance affordability with convenience. A smaller proportion, 6%, of respondents were unemployed. Financial limitations within this group likely drive a preference for budget-friendly options, underlining the importance of affordability as a key consideration in this segment.

Income (Figure 11, Appendix)

The results indicate considerable variation in gross monthly earnings, reflecting a broad spectrum of purchasing power and financial priorities. The largest proportion of respondents,

comprising 21% of the sample, reported earning 820 euros or less per month. This group likely includes individuals such as students, part-time workers, emphasising the importance of cost-sensitive purchasing behaviours within this segment. By contrast, 15% of respondents reported monthly earnings between 1501 and 1800 euros, representing middle-income individuals. Additionally, 11% of the sample fell into the 821–935 euros income bracket, reflecting a demographic likely focused on budget-friendly options. Conversely, another 11% of respondents reported earning more than 4000 euros per month, representing affluent consumers who may gravitate towards premium brands or products emphasizing quality and exclusivity. These two groups (with an income between 821 and 935 euros and more 4000 euros), showcase contrasting economic profiles and priorities. Other income brackets showed a more even distribution across the sample. Six percent of respondents reported monthly earnings in each of the following brackets: 936–1000 euros, 1001–1200 euros, 1201–1500 euros, and 1801–2000 euros. Furthermore, 9% of respondents fell into the 2501–3200 euros bracket, reflecting a smaller segment of higher-income earners. The remaining 4% of respondents reported incomes between 2001–2500 euros and 3201–4000 euros, completing the spectrum of financial diversity.

The variability in income levels suggests diverse consumer needs and preferences, ranging from affordability and value-driven purchases to a focus on premium products.

2.5.2. Familiarity With Selected Brands

Understanding which brands consumers are familiar with is essential for analysing survey responses, as familiarity often serves as the foundation for brand perception and preference. Familiarity influences how consumers evaluate brand attributes, such as quality, value, and trustworthiness, and is closely linked to their likelihood of purchasing a product (Hoyer et al. 2020). Brands with higher levels of familiarity are often perceived more

favourably, as consumers tend to trust and prefer brands they recognise (Campbell and Keller 2003). This makes familiarity a critical variable in interpreting how respondents view and evaluate each brand, within the perceptual map analysis.

As can be observed in Figure 12 at the Appendix, Royal Canin emerged as the most recognised brand, with 87% of respondents indicating familiarity. This substantial level of recognition highlights Royal Canin's strong presence in the Portuguese dog food market. Its widespread familiarity is likely attributable to frequent veterinary endorsements, a reputation for science-based formulations, and extensive marketing efforts. Advance was familiar to 76% of respondents, indicating a slightly lower level of recognition compared to Royal Canin, but still representing significant market awareness. Purina was recognised by 80% of respondents, reflecting its broad appeal as a mid-range brand. Purina's familiarity can be attributed to its widespread availability across multiple retail channels and its longstanding reputation in the pet food industry. PorSi, a private label brand, was familiar to 55% of respondents, indicating a comparatively lower level of recognition. This finding aligns with its positioning as a budget-friendly alternative, which typically garners less visibility than multinational companies' brands. Private labels like PorSi often rely on price competitiveness rather than extensive marketing, which may explain its relative lack of familiarity compared to the other brands (Solomon et al. 2013).

The high familiarity with Advance, Purina, and Royal Canin suggests that these brands have successfully established themselves as key players, with significant visibility and credibility among consumers. In contrast, the lower familiarity of PorSi highlights a potential limitation for this analysis, as less informed evaluations may lead to less precise positioning of PorSi on the perceptual map. This limitation should be acknowledged when interpreting the results, as it may reflect not just consumer perceptions but also gaps in awareness of the brand.

2.5.3. Data Analysis: Brand-Attribute Scores

The subsequent phase of the data analysis centred on evaluating the responses from the main section of the survey, where participants rated each brand based on the predefined attributes. This analysis consisted in calculating the mean score for each brand-attribute combination, enabling the identification of underlying patterns and consumer perceptions associated with the evaluated brands. This approach provided a systematic framework for understanding the relative positioning of each brand, within the context of the selected attributes.

Figure 1: Brand-Attribute Scores

	Science-based Production	Innovation	Premium	Nutritive- Balanced	Trustworthiness	Attractiveness	Reputation	Informative	Flavour Variety
Advance	3,723	3,511	3,553	3,681	3,830	3,468	3,830	3,638	3,553
Por Si	2,468	2,340	2,000	2,553	2,553	2,426	2,255	2,532	2,489
Purina	3,489	3,532	3,362	3,489	3,596	3,532	3,574	3,362	3,787
Royal Canin	4,043	3,766	4,043	3,957	4,149	3,979	4,319	4,000	4,000

For example, if we observe Figure 1, and we focus on the attribute “Science-based Production”, the results indicate that Royal Canin is strongly perceived as a brand that emphasis science in its production, while PorSi, by contrast, is viewed as less reliant on science-based processes. Such distinctions highlight the differential positioning of the brands, Royal Canin enjoy higher credibility in scientifically driven production, whereas private-label brands like PorSi are less associated with these attributes.

2.5.4. Correlation Between Attributes & Dimensional Reduction

Upon aggregating the average scores for all brand-attribute combinations, we calculated the correlation coefficient, denoted as “ r ”, which measures the strength and direction of the linear relationship between two variables, ranging from -1 to 1. When $r=1$, there is a perfect positive correlation, meaning that as one variable increases, the other increases proportionally. Conversely, $r = -1$ indicates a perfect negative correlation, where an increase in one variable

corresponds to a proportional decrease in the other. We discovered that the attributes were highly correlated, with a correlation coefficient of $r > 0.95$, which signifies a very strong positive linear relationship between the attributes. This indicates that the attributes are highly similar in behaviour, such that when one attribute's score for a brand is high, the score of the other attribute is also likely to be high. This high degree of correlation indicated that respondents tended to evaluate all attributes in a similar way, possibly reflecting an overarching perception of brand quality. As a result, when attempting to perform Principal Component Analysis (PCA), only one significant dimension was identified, meaning that a single component explained most of the variance in the data.

While this result underscores the consistency of perceptions across attributes, it posed a challenge for the construction of a meaningful perceptual map. A single dimension does not allow for the visual representation of nuanced differences between brands. To overcome this limitation, we manually clustered attributes into two conceptual dimensions based on their thematic relevance, enabling us to construct a two-dimensional perceptual map.

Dimension 1- Science & Product Development

The first dimension was derived by grouping attributes directly related to the scientific and developmental aspects of dog food production. These include Science-based Production; Innovation; Nutritive Balanced and Flavour Variety. These attributes collectively represent a brand's focus on the technical and developmental elements of their products. Grouping them under one dimension provides insights into how scientifically advanced and diversified, consumers perceive the brands to be. For instance, a brand like Royal Canin, which scores highly on this dimension, is likely viewed as a leader in science-driven innovation and nutritional quality.

Dimension 2 - Brand Identity & Appeal

The second dimension was created by grouping attributes more aligned with the brand's overall essence, reputation, and emotional appeal. These include Trustworthiness; Attractiveness; Reputation; Informative and Premium.

This grouping emphasizes attributes that resonate with the emotional and perceptual aspects of consumer decision-making. Dimension 2, therefore, reflects how consumers view the brand's identity and overall standing in the market. For instance, a brand scoring highly on this dimension may be seen as reputable, attractive, and capable of generating consumer trust.

The manual clustering approach was necessary to address the limitation of PCA, which did not distinguish multiple significant components due to the high correlation among attributes. By organising the attributes into two conceptually meaningful dimensions - "Science and Product Development" and "Brand Identity and Appeal" - we were able to preserve the richness of the data, while creating a perceptual map that effectively captures nuanced brand positioning. This two-dimensional structure allows us to compare brands along both axes, providing deeper insights into how brands are perceived based on both technical aspects of their products and their broader brand identity. The result is a perceptual map that serves as a valuable tool for understanding consumer preferences, identifying potential strategic opportunities for brand differentiation.

2.5.5. Building The Perceptual Map

With the two dimensions established, the next step was to calculate the average score for each brand-dimension combination. To do this, the mean scores of the attributes that belong to each dimension for every brand were combined. A brand's average score inside a certain dimension was determined by taking the mean of the average scores of the brand's corresponding attributes within that dimension.

For example, the average score for Royal Canin on Dimension 1 (Science and Product Development) was calculated as follows:

$$\text{Average Score (Royal Canin - Dimension 1)} = \frac{\text{Average (Royal Canin – Science based Production; Royal Canin – Innovation; Royal Canin - Nutritive Balanced; Royal Canin - Flavour Variety)}}{4}$$

This methodology was applied consistently across all brands and both dimensions, ensuring a standardised approach for comparison.

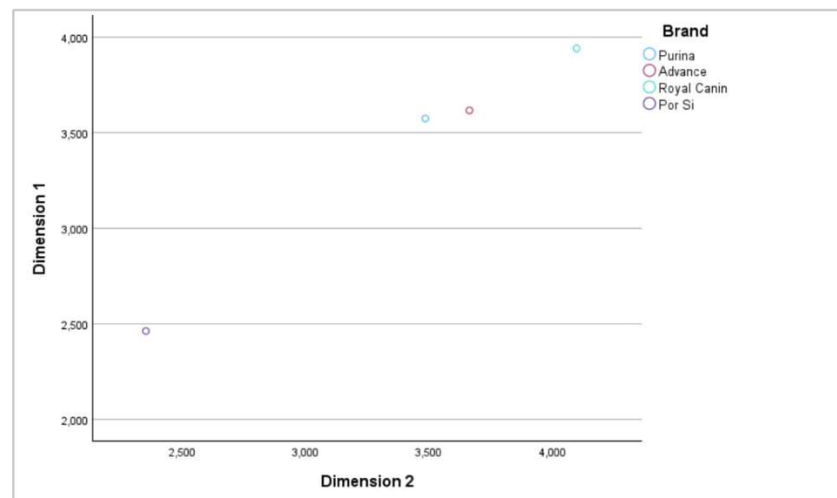
Figure 2: Brand-Dimension Scores

	Dimension 1	Dimension 2
Advance	3,617	3,664
Por Si	2,463	2,353
Purina	3,574	3,485
Royal Canin	3,941	4,098

Once the averages for each brand-dimension combination were calculated, the data was input into SPSS to construct the perceptual map. Dimension 1 (Science and Product Development) was plotted on the y-axis, while Dimension 2 (Brand Identity and Appeal) was plotted on the x-axis. Using these axes, the graph visually represents the positioning of the four selected brands: Advance, PorSi, Purina, and Royal Canin.

This perceptual map shows the brands' relative positioning according to consumer perceptions, highlighting their strengths and weaknesses in the selected dimensions. The positioning of each brand reflects its general appeal and reputation, as well as how consumers view its emphasis on science-driven research and product quality. For comprehending market dynamics and identifying opportunities for differentiation or improvement, this visualization is an essential tool.

Figure 3: Dog Food Brands relative positioning: The Perceptual Map



Coordinates: Brand (x,y): Brand (dimension 2, dimension 1)

Royal Canin is in the upper-right quadrant of the perceptual map with coordinates (4.098, 3.941), revealing strong positive correlation with both dimensions. On Dimension 1, Royal Canin's high score indicates that consumers perceive it as a leader in science-based production, which might be underpinned by its focus on veterinary-endorsed formulas and evidence-driven product innovation. It is also seeming to be recognised for providing nutritionally balanced options that cater to specific dietary needs and for offering a broad range of flavours to accommodate diverse pet preferences. On Dimension 2, Royal Canin achieves similarly high marks, reflecting a strong reputation as a trusted and reliable brand. Consumers view it as highly attractive, supported by its polished brand presentation and premium positioning in the market. Its extensive presence and endorsements support its solid reputation, and customers find its product information to be clear and comprehensive, allowing them to make well-informed decisions. Royal Canin's standing as a recognized market leader in this analysis is highlighted by its overall position on the perceptual map, which shows balanced excellence in both scientific and emotive dimensions.

Advance is also positioned in the upper-right quadrant, though slightly below and to the left of Royal Canin, at coordinates (3.664, 3.617). This placement suggests that consumers associate Advance with positive attributes on both dimensions, but to a lesser extent than Royal Canin. A direct comparison between the two brands (Figure 13, Appendix) highlights that the most significant difference on Dimension 1 lies in the attribute of flavour variety, where Royal Canin has a score of 4.000 while Advance presents a lower score of 3.553. While Advance is perceived as competent in science-based production and innovation, offering nutritionally balanced products, it does not reach the same level of differentiation as Royal Canin, particularly in flavour variety but in overall scientific excellence. On Dimension 2, Advance is recognized as a trustworthy and informative brand, reflecting its ability to establish credibility, and offering reliable information about their products. However, when compared to Royal Canin, Advance's overall positioning is further weakened by relatively lower scores in attractiveness (-0.511 difference) and reputation (-0.489 difference), indicating that it lacks the premium appeal and widespread recognition that consumers associate with Royal Canin. This positioning could also be influenced by the fact that fewer respondents are familiar with the Advance brand. Limited familiarity may lead to lower perceptions across several attributes, as consumers are less likely to fully associate positive characteristics with a brand they do not know well.

Purina, with coordinates (3.485, 3.574), is positioned near Advance in the perceptual space, reflecting similar but slightly lower consumer perceptions on both dimensions. On Dimension 1, Purina demonstrates strength in specific attributes such as innovation and flavour variety, where it outperforms Advance (Figure 14, Appendix). Consumers perceive Purina as a brand that actively invests in innovation, bringing new and creative solutions to the market. Additionally, it is seen as offering a considerable range of different flavours, catering to diverse preferences. However, Advance leads in critical areas like science-based production and

providing nutritionally balanced products. This difference results in Purina's overall score for Dimension 1 being lower than Advance's. On Dimension 2, Purina is seen as a trustworthy and reputable brand with a good level of attractiveness (scoring slightly higher than Advance in this attribute). However, this brand seems to lack the level of informativeness, and premium status associated with the higher-scoring brands. The proximity of Purina and Advance indicates that both brands operate in a similar perceptual space, potentially competing for the same segment of consumers. Purina's slightly lower scores, however, suggest that it may face greater challenges in establishing distinctiveness, within the market.

PorSi occupies a distinctly different position on the map, with coordinates (2.353, 2.463) placing it in the lower-left quadrant. Comparing this positioning to the other brands, it shows poorer connections with both dimensions. Notably, PorSi does not present any attribute score higher than 3, given that the scores range from 1 to 5, this implies that consumers perceive PorSi as underperforming across all attributes, highlighting significant challenges in building a strong brand positioning in the market. On Dimension 1, PorSi is perceived as lacking emphasis on science-based production and innovation, as well presenting low scores for nutritive balance and flavour variety. The brand is not viewed as a forward-thinking or scientifically credible brand, which can lead to a diminished level of trust and reliability in the eyes of consumers, particularly among those who prioritize health-conscious and scientifically validated products for their pets. On Dimension 2, PorSi scores particularly low across all attributes, showing weak consumer perceptions of the brand. It performs particularly poorly in premium, with the lowest score of 2.00, suggesting that consumers do not associate PorSi with high-quality or premium products. Similarly, its reputation (score of 2.250) indicates that the brand struggles to establish credibility and recognition in the market. Additionally, PorSi is perceived as lacking trustworthiness, attractiveness, and informativeness, further limiting its ability to connect with consumers. This positioning suggests that PorSi is regarded as a utilitarian or budget-oriented

option, catering to price-sensitive consumers rather than those seeking premium or scientifically advanced products. While this may represent a deliberate market strategy, it also highlights a potential gap in perceived value compared to the other brands.

This analysis allows us to clearly identify how each brand is positioned in the minds of consumers and offers actionable insights into their competitive strengths and weaknesses.

3. Bonus Question

3.1. Sustainability Consideration In Our Study

Sustainability has become an increasingly significant factor influencing consumer behaviour across various industries, including the pet food market. This trend reflects a growing awareness of environmental impacts and the desire for ethical purchasing decisions (Grunert et al. 2014). Our primary analysis evaluated key attributes such as price, health benefits, and sustainability in dog food selection. However, it did not directly address consumers' willingness to pay a premium for sustainable products—a critical distinction in understanding the depth of environmental responsibility in consumer preferences.

Research indicates that a significant segment of consumers is willing to pay more for products with sustainable attributes (Grunert et al. 2014). For instance, a meta-analysis of consumer studies on sustainability labels, found that consumers often demonstrate a preference for environmentally friendly products and are willing to pay a premium for these (Grunert et al. 2014). This willingness to pay is heavily influenced by factors such as perceived consumer effectiveness—the belief that individual actions can contribute to environmental preservation (Kovács and Keresztes 2019).

In the pet food industry specifically, sustainability considerations are gaining traction. Pet owners are increasingly aware of the environmental impact of their consumption behaviours, which has resulted in a growing demand for environmentally friendly production methods, sustainable ingredients, and recyclable packaging materials (Purina Institute 2024). However, studies suggest that the willingness to pay a premium for these sustainable products remains inconsistent, with only 12% to 16% of consumers globally expressing readiness to spend more on sustainably produced pet food (Pet Food Industry 2023).

The distinction between expressed preferences and actual purchasing behaviour is crucial. If consumers prioritise sustainability only when it incurs no additional cost, it suggests

that sustainability functions as a secondary or conditional priority. Conversely, demonstrated willingness to pay more for sustainable products reflects a deeper commitment to environmental responsibility (Kovács and Keresztes 2022). Understanding this dynamic is essential for brands aiming to align their pricing and marketing strategies with consumer values. Positioning products with transparent communication about sustainable practices can enhance trust, loyalty, and the perceived value of sustainable offerings (Grunert et al. 2014).

3.2. Survey Development

To explore consumers' willingness to pay a premium for sustainable dog food products, we utilised the same survey (Figure 16, Appendix) designed for the perceptual map analysis, which included a specific section dedicated to sustainability questions. While the survey's overall design, participant selection criteria, and data collection methodology were comprehensively explained in the earlier chapter focused on perceptual maps, this chapter concentrates exclusively on the analysis of the sustainability section.

The sustainability section of the survey was designed to evaluate consumer attitudes and behaviours, regarding sustainable dog food products. This section included four key questions, each targeting a distinct aspect of consumer decision-making. These questions were developed based on established guidelines for survey-based research to ensure clarity, reliability, and validity (Bryman 2016). Below, the questions and their purposes are presented in detail.

Question 1 - Interest In Sustainable Products

"Suppose your preferred dog food brand offered a sustainable product at a slightly higher price. Would you be interested in buying it?" - Respondents were required to choose between two options: Yes or No.

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The purpose of this question was to gauge initial interest in sustainable dog food and determine whether sustainability resonates as a meaningful factor in consumers' purchasing decisions. Binary choice questions, such as this, are widely recognised for their clarity and effectiveness in capturing unambiguous responses (Fink 2017). By framing the question within the context of the respondent's current preferred brand, the survey minimised hypothetical bias that can occur when consumers are presented with unfamiliar scenarios (Krosnick and Presser 2010).

Question 2 - Current Price Paid for Dog Food

"How much do you usually pay for a 10kg package of dry food?"

This open-ended question designed to gather insights into the average price consumers currently pay for dog food, within the sample. By collecting this data, the study aimed to establish a baseline for typical spending, which would serve as a reference point when analysing responses related to willingness to pay for sustainable options. Open-ended questions allow for greater accuracy and variability in responses, capturing real-world price trends without imposing pre-defined limits (Reja et al. 2003).

Question 3 - Willingness To Pay A Premium

"How much more would you be willing to pay for this sustainable dog food compared to your current choice? (consider a 10kg package of dry food)." - Respondents selected one of the following options: €0; €2.5; €5; €7.5; €10; €12.5; €15; €20; Above €20.

The objective of this question was to quantify the additional monetary value consumers are willing to allocate to sustainability attributes. The multiple-choice format allowed for precise measurement of willingness to pay (WTP), while accommodating diverse consumer perspectives. This approach is aligned with contingent valuation theory, which emphasizes the importance of capturing economic preferences in hypothetical but realistic scenarios (Mitchell and Carson 1989). By offering a range of price increments, the question facilitated the

identification of price sensitivity thresholds and detailed segmentation of consumer preferences (Louviere et al. 2010).

Question 4 - Willingness To Switch Brands

"Would you consider trying a different brand if it offers only sustainable dog food options?" - Respondents answered with a binary choice: Yes or No.

This question aimed to assess the potential for sustainability to act as a competitive advantage capable of influencing brand loyalty. Understanding consumers' willingness to switch brands provides valuable insights into the strength of sustainability as a differentiating factor in the marketplace. The usage of a binary response format enabled straightforward analysis of brand-switching tendencies, a critical aspect when evaluating market opportunities for sustainable innovations (Oliver 1999).

3.3. Scope Of The Analysis

This chapter aims to achieve two primary objectives. The first objective is to identify the willingness of consumers to pay a premium for sustainable dog food products. By analysing the collected data, the chapter quantifies the additional monetary value consumers are prepared to allocate to sustainability compared to their current purchasing choices. This analysis offers a direct measure of the economic importance consumers place on sustainability, in the context of dog food consumption.

The second objective involves correlating willingness to pay with specific demographic factors, to provide a nuanced understanding of consumer behaviour. These factors include age, occupation, and income. The analysis examines how different age groups prioritise and assign value to sustainability, recognising that younger consumers, often more attuned to environmental concerns, may exhibit a higher willingness to pay (Euromonitor International

2023). It also considers the influence of professional background and employment status on spending behaviour, exploring whether occupation shapes consumer attitudes toward sustainable products. Furthermore, the study evaluates the relationship between income levels and willingness to pay, acknowledging that individuals with higher financial capacity are generally better positioned to prioritise ethical and environmental considerations in their purchasing decisions (Nguyen et al. 2020).

By integrating these demographic dimensions, this chapter offers critical insights into the drivers of consumer decisions regarding sustainable dog food products. These findings provide actionable knowledge for market segmentation and strategy development. Thus, this chapter not only quantifies the willingness to pay for sustainability but also elucidates the demographic and socioeconomic variables that influence consumer preferences, contributing to a comprehensive understanding of sustainability's role in consumer behaviour.

3.4. Data Analysis

3.4.1. Interest In Sustainable Products & Willingness to Switch Brands

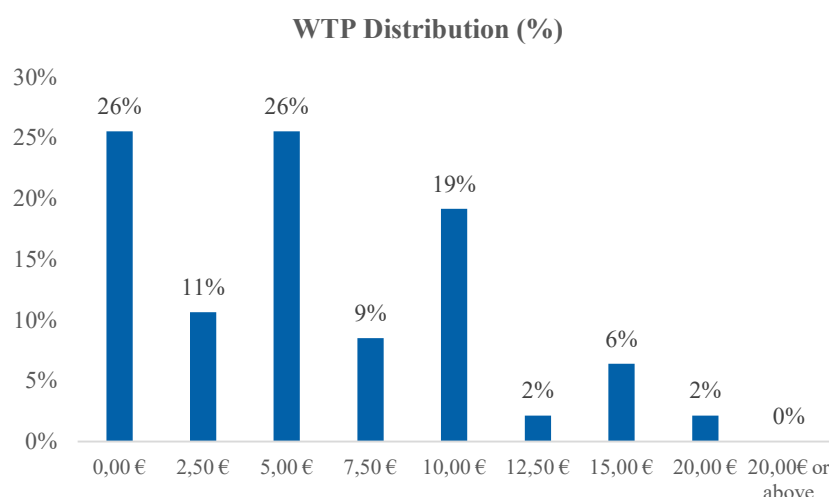
Our analysis reveals that 72% of respondents are willing to purchase a sustainable product at a slightly higher price from their preferred dog food brand. This demonstrates a considerable interest in supporting sustainable practices; however, it is important to note that the question does not specify the exact premium they would need to pay. The lack of a defined monetary value likely contributed to the positive response rate, as respondents may perceive the price increase as marginal.

In contrast, when asked if they would consider switching to another brand that exclusively offers sustainable options—without additional costs—the affirmative responses rose to 82%. This difference highlights two key insights: first, while many consumers value

sustainability, they exhibit a lower willingness to pay a premium for it. Second, the higher willingness to switch brands for sustainability, suggests relatively low brand loyalty among respondents, with sustainability serving as a compelling factor in their decision-making. These findings emphasize the importance of offering affordable sustainable options to meet consumer expectations and leverage their willingness to change for environmentally conscious alternatives.

3.4.2. Identifying Willingness To Pay For Sustainability

Figure 4: Preferred Premium Amounts for a Sustainable Dog Food



The analysis of respondents' willingness to pay a premium for sustainable dog food revealed diverse consumer behaviours and preferences. Among the participants, 26% (12 respondents) indicated that they were not willing to pay any additional amount, selecting the €0 option. This group represents a significant portion of consumers who do not prioritise sustainability, when it comes at an additional cost. Conversely, another 26% of respondents expressed a willingness to pay €5 more for sustainable dog food, making it the most frequently selected premium amount. This suggests that a substantial share of consumers recognises the value of sustainability, but their willingness to pay is limited to a modest increase in cost. A

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smaller but notable group, 19% of participants, indicated a willingness to pay €10 more, highlighting a higher level of commitment to sustainability, within this segment. The remaining participants demonstrated varying degrees of willingness to pay, with 11% willing to pay €2.5 more, 9% willing to pay €7.5 more, and 6% willing to pay €15 more. Only two respondents, representing 2% each, selected €12.5 and €20 as their preferred premium amounts. Notably, no respondents selected the option of paying more than €20, suggesting an apparent ceiling in the willingness to pay for sustainability, within the surveyed population.

The mean willingness to pay (WTP) of €5.75 for a sustainable option can be interpreted as a relatively low value, when compared to the average price paid by respondents for a 10kg package of conventional dry dog food, which is €40.55 (Figure 17, Appendix). This represents an average premium of approximately 14.2%, suggesting that while some consumers are willing to pay an extra for sustainability, the additional amount that they are willing to commit is relatively modest.

When contextualized against industry norms for sustainability premiums, the €5.75 mean is on the lower end of the spectrum. Research on consumer behaviour in sustainable product markets often shows that consumers are willing to pay a 20%–50% premium for eco-friendly or organic products (Essoussi and Zahaf 2008). In this case, the average WTP for sustainable dog food falls short of these benchmarks, suggesting that while sustainability is recognized as valuable, it is not a priority strong enough to drive higher financial commitments in this market segment.

The standard deviation (€4.97) and variance (24.71) (Figure 16, Appendix) revealed significant variability in WTP among respondents, pointing to diverse financial capacities, personal priorities, and attitudes toward sustainability. This heterogeneity may be influenced by factors such as income disparities, differing levels of environmental consciousness, or variations in perceptions of the tangible benefits associated with sustainable products. Such

diversity complicates market segmentation and highlights the challenge of designing pricing strategies that cater to all consumer groups.

The findings from the analysis of respondents' willingness to pay (WTP) for sustainable dog food products provide important insights into the Portuguese market. Although consumers are becoming more conscious of the significance of sustainability in their purchasing decisions, our findings suggest that this awareness does not yet correspond to a general willingness to pay a significant premium amount for sustainable products. One important finding is that 26% of respondents, a sizable portion of the sample, said they are unwilling to pay more for sustainable dog food. This substantial share of consumers reflects a significant level of price sensitivity, where affordability and practicality outweighing sustainability's perceived value. Such behaviour is consistent with findings in consumer research, where price is often cited as the most critical determinant of purchasing decisions, particularly for everyday products (Hughner et al. 2007). With sustainability being a secondary or non-prioritised attribute. This behaviour underscores a broader reluctance on the Portuguese market to pay for sustainability, when it comes with a higher price tag.

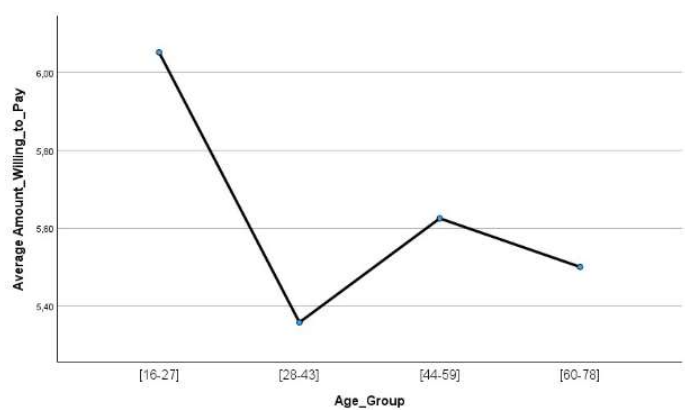
For businesses, this underscores the importance of developing strategies that integrate sustainability with affordability, ensuring that sustainable dog food products can be accessible to a broad range of consumers. Rather than framing sustainability as a luxury, companies can position it as an essential attribute that delivers meaningful benefits to the product, without significantly rising costs. Moreover, storytelling and education should play a pivotal role in marketing efforts. Brands can connect emotionally with consumers by highlighting real-world impacts of their choices (e.g. how purchasing sustainable dog food contributes to reducing carbon emissions, protecting ecosystems, or supporting ethical farming practices). Work in partnership with renowned influencers or veterinarians to establish a connection between sustainability and superior product quality, which promotes a better pet health can also resonate

with consumers on a personal level, making the value proposition more persuasive. Finally, fostering trust and transparency is crucial. By providing clear information about the sustainability credentials of their products, such as certifications, sourcing methods, or environmental impact metrics, brands can build consumer confidence and demonstrate the tangible value of their offerings, which may help bridge the gap between awareness and financial commitment.

3.4.3. How Age Influences The Willingness To Pay More For A Sustainable Product

The analysis of willingness to pay (WTP) for sustainable dog food reveals notable variations across different age groups, reflecting the influence of age on consumer preferences and financial commitment to sustainability. The data highlights both similarities and differences in the mean WTP, range of responses, and variability, within each age segment.

Figure 5: Average Amount WTP by Age Group



Among respondents aged 16 to 27, the mean WTP was €6.05, the highest average across all age groups. This segment exhibited a range of responses from €0 to €15, with a standard deviation of €4.88 (Figure 18, Appendix). These results suggest that younger consumers are

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reasonably more inclined to pay a premium amount for sustainable products compared to older age groups. Given that younger generations are frequently distinguished by their increased concern for sustainability and social responsibility, the higher mean WTP may indicate a greater understanding and prioritization of environmental issues. However, the heterogeneity within this group, as indicated by the standard deviation, highlights a diversity of financial capacities or different priorities among younger respondents. Adult respondents aged between 28 and 43 reported a mean WTP of €5.36, the lowest average among all groups. The range of responses in this segment was narrower, from €0 to €10, with a standard deviation of €4.19. The lower mean and reduced range of WTP in this age group may reflect competing financial priorities, such as family expenses or career-related investments, which limit their willingness to allocate additional resources toward sustainable products. Despite this, the standard deviation indicates some level of diversity in attitudes, with a small proportion of respondents willing to pay closer to the upper end of the range. The middle-aged group, aged 44 to 59, exhibited a mean WTP of €5.63, with responses ranging from €0 to €15 and a standard deviation of €4.61. This group's mean WTP is slightly higher than that of the 28–43 age group, suggesting a moderate willingness to pay for sustainability. The broader range of responses and moderate standard deviation indicate varying attitudes within this segment, potentially reflecting differences in financial stability, environmental awareness, and personal priorities. Older adults aged 60 to 78 reported a mean WTP of €5.50, with responses ranging from €0 to €20. This group had the highest standard deviation, at €8.36, indicating significant variability in their willingness to pay. While the mean WTP is comparable to other age groups, the wide range and high standard deviation suggest that some older consumers are willing to make substantial financial commitments to sustainability, while others remain unwilling to pay any premium. This variability may be influenced by factors such as disposable income, retirement status, and individual attitudes toward environmental issues.

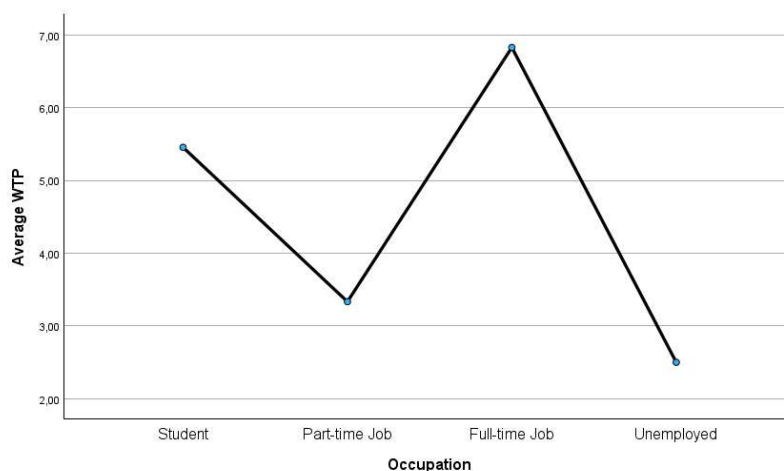
This analysis reveals that age is not a straightforward determinant of willingness to pay for sustainability. Consumer behaviour is shaped by a combination of generational perspectives, life-stage priorities, and individual financial circumstances. Younger customers, however, are more inclined to place a higher priority on sustainability due to social and environmental values, whereas middle-aged and adult consumers weigh these considerations against their immediate financial obligations.

Research highlights a significant generational gap in sustainable consumption, with younger consumers demonstrating a stronger preference for sustainable products compared to older generations (Statista n.d.). Younger generations, specifically Millennials and Generation Z, are progressively prioritising sustainability in their consumer preferences driven by a heightened awareness of environmental issues and a desire to align purchases with their personal values. This shift reflects a deeper understanding of how consumption habits impact the planet, with many young consumers willing to pay a premium for brands that show commitment to sustainability. (First Insight n.d.). Older generations generally show a less consistent commitment to sustainability. While many seem to be aware of environmental issues and may support sustainable practices, their purchasing decisions often prioritise factors like price, convenience, and brand loyalty over eco-consciousness. Studies suggest that older generations tend to be slower to adopt sustainable products due to a lack of familiarity with newer options or scepticism about their efficacy and cost (Statista n.d.). This group is also more likely to adopt sustainable practices when they see direct financial or practical advantages.

3.4.4. How Occupation Influences The Willingness To Pay More For A Sustainable Product

Figure 6: Average Amount WTP by Occupation Group

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The analysis reveals significant variations across different occupational groups, reflecting the influence of employment status on consumer preferences and their financial capacity to prioritise sustainability. The data highlights both similarities and differences in the mean WTP, range of responses, and variability, within each occupational category.

Among students, the mean WTP was €5.45, with responses ranging from €0 to €15 and a standard deviation of €4.16 (Figure 19, Appendix). This group demonstrates moderate willingness to pay a premium for sustainable products, likely influenced by their heightened awareness of environmental issues and a sense of social responsibility, often observed in younger demographics. However, the relatively high variability, as indicated by the standard deviation, reflects differences in financial resources as students often have limited or inconsistent income sources. Respondents working part-time reported a WTP at €3.33, with responses ranging from €0 to €10. This lower average suggests that part-time workers may have more restricted budgets and competing financial priorities, which limit their ability to pay a premium for sustainability. Those with full-time employment exhibited the highest mean WTP at €6.76, with responses ranging from €0 to €20 and a standard deviation of €5.45. This higher average suggests that full-time workers are generally more financially stable and, therefore, more willing to allocate resources toward sustainable purchases. The broader range of responses and moderate standard deviation, however, indicate variability within this group, reflecting

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differences in individual priorities, disposable income, and attitudes toward sustainability. Unemployed respondents reported the lowest variability and range in WTP, with a mean of €2.50, and responses ranging from €0 to €5. This group's limited financial resources and lack of stable income likely contribute to their low willingness to pay a premium for sustainable products. The narrow range and lower standard deviation suggest a more uniform reluctance within this segment, emphasizing the critical role of economic stability in shaping consumer behaviour.

From this analysis, we concluded the expected outcome, that individuals with stable employment, such as those in full-time jobs, are willing to pay a higher premium for sustainable dog food. However, students also exhibit a great WTP, which can be attributed to this occupational group being predominantly composed of young people, who are often more environmentally conscious and prioritise sustainability.

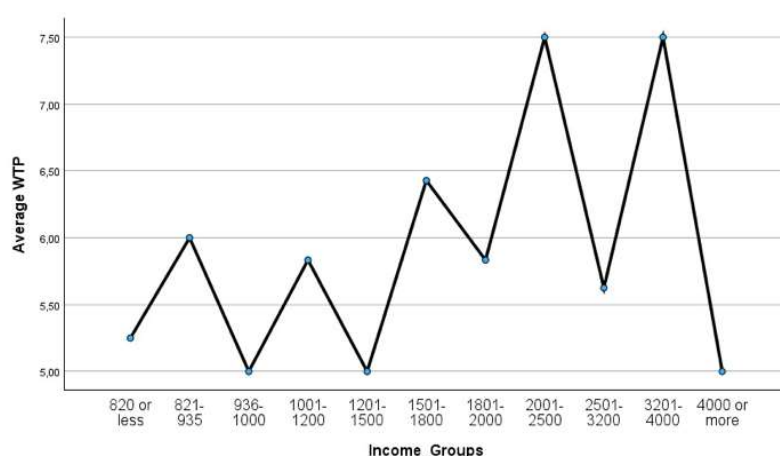
People with stable employment are often more willing to pay a premium for sustainable products, as financial security allows them to prioritise values such as environmental and social responsibility over cost alone. A study shows that consumers with steady incomes are more likely to view sustainable choices as long-term investments rather than immediate expenses (Deloitte 2022). These individuals often perceive their financial stability as an opportunity to support ethical practices, such as eco-friendly production or fair trade, aligning their purchasing power with their principles. Additionally, stable employment provides disposable income, which makes the slightly higher cost of sustainable goods less prohibitive. This trend underscores how economic factors, such as job stability, significantly influence the ability and willingness of consumers to make eco-conscious decisions, in their everyday lives.

People who are unemployed or have a part-time job may still care deeply about sustainability, but their ability to prioritise eco-friendly options in their purchasing decisions is often constrained by financial situations. For this group, affordability and immediate necessity

often take precedence over ethical or environmental considerations (World Economic Forum 2022). Still, research shows that unemployed individuals may still engage in sustainable practices that do not incur extra costs, such as reducing waste, reusing items, or buying second-hand goods (Statista n.d.). While their purchasing power may be limited, their concern for the environment is not necessarily diminished; rather, it is expressed in ways that align with their economic circumstances.

3.4.5. How Income Influences The Willingness To Pay More For A Sustainable Product

Figure 7: Average Amount WTP by Income Group



The analysis of willingness to pay (WTP) for sustainable dog food shows distinct patterns across different income groups, exposing the influence of financial capacity and disposable income when it comes to consumer behaviour. The data highlights notable differences in the mean WTP, range of responses, and heterogeneity, within each income segment.

Respondents with income levels between €2001- €2500 and €3201- €4000 exhibited the highest mean WTP at €7.50, with responses ranging from €5 to €10 (Figure 20, Appendix).

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This indicates that consumers in these income brackets are more willing to pay a premium for sustainable products. The narrower range of responses suggests a more consistent willingness among individuals in these groups, potentially driven by their financial stability and capacity to prioritise sustainability in their purchasing decisions.

The income group earning €1501 to €1800 demonstrated a mean WTP of €6.43, with a standard deviation of €4.53 and a range of responses from €0 to €12.50. The relatively high mean presented by this group, suggests a moderate prioritisation of sustainability. The broader range of responses and variability indicate differing financial priorities, within this segment.

Individuals earning €821 to €935 reported the third-highest mean WTP of €6.00, with responses ranging from €2.50 to €10. The fact that individuals which belong to this group are willing to pay an amount like that of higher-income groups, might indicate a strong personal commitment to sustainability or a careful prioritization of their limited financial resources.

The groups with the lowest mean WTP included those earning €936 to €1000, €1201 to €1500, and €4000 or more, with responses ranging broadly from €0 to €10, €0 to €15, and €0 to €20, respectively. These segments showed more significant variability, suggesting diverse attitudes within the groups. For higher-income individuals (earning €4000 or more), this variability may reflect differing prioritisation of discretionary spending, with some willing to invest heavily in sustainability, while others remaining less inclined.

The results of this analysis indicate that there is no clear positive correlation between income and willingness to pay a premium for sustainability. While it might be expected that individuals with higher salaries would allocate more resources toward sustainable products, this pattern is not consistently observed. Our findings reveal that willingness to pay a premium for a sustainable option is influenced by factors beyond income level, which may include individual priorities, spending habits, perceptions of sustainability, social and culture factors. These results underscore the complexity of consumer behaviour, proposing that financial capacity alone does

not determine the value that individuals place on sustainable options. Instead, a variety of personal and contextual factors play a significant role in determining these decisions.

People with higher incomes are not necessarily the ones most willing to pay a premium for sustainable options, because their purchasing decisions are influenced by diverse factors, beyond financial capacity. Research suggests that while higher-income individuals often have the means to afford sustainable products, they may prioritise other attributes, such as brand prestige, convenience, or personal preferences, over sustainability (PwC 2024). Additionally, some high-income consumers may exhibit scepticism about the effectiveness of sustainable options, or view sustainability as a secondary concern when compared to quality or luxury.

In contrast, people with lower or middle incomes who value sustainability as a personal or ethical priority might demonstrate a stronger willingness to allocate their limited resources toward environmentally friendly products, even if it means sacrificing the consumption in other areas (Deloitte 2022). This shows that attitudes and values toward sustainability often outweigh mere financial capacity in influencing consumer behaviour.

4. Conclusion

The pet food market has seen significant growth in recent years, driven by changing consumer preferences and increasing pet ownership. This growth has intensified competition, pushing brands to adopt distinct strategies and positioning to meet diverse consumer needs. This thesis provides significant findings that contribute to the understanding of the pet industry, addressing existing gaps in the Portuguese market. By combining interviews with perceptual mapping and conjoint analysis, we explored how these attributes affect consumer perceptions, behaviours, purchasing decisions, and brand preferences.

Through conjoint analysis, we were able to examine Portuguese consumers' choice of dog food, focusing on the key attributes that influence their decisions. From the attribute perspective, the five attributes most valued by Portuguese consumers are availability, health benefits, organic quality, price, and sustainability. Our findings align with existing literature, as the results reveal that price is the primary attribute considered by consumers. However, for Royal Canin, health benefits attribute is a priority attribute, with consumers preferring to choose dog food with health benefits. Another important factor is sustainability and organic quality, which emerges as a highly significant consideration. The same applies to organic ingredients, which play a significant role in enhancing product attractiveness. Although they receive less attention than other factors, consumers also tend to choose products with full availability and those produced with organic ingredients.

These results provide a reference for the optimization of products, suggesting that the focus should be on price, health benefits, and sustainability to meet the needs of major consumer groups. Moreover, throughout the study of the main attributes, it was possible to identify the “perfect” combinations of those attributes. However, it is evident that in the real world, combining the highest-scoring attributes with the lowest price would be unfeasible for brands. Despite the unrealistic scenario presented by conjoint analysis, its application was crucial to

understanding the impact of the attributes used in our analysis. Moreover, through analysis using the simulator, we were able to predict consumer preferences in different market scenarios.

The perceptual analysis, conducted in this thesis, explored four prominent pet food brands - Advance, PorSi, Purina, and Royal Canin, understanding where Portuguese consumers associate these brands with nine diverse attributes, including innovation, trust and attractiveness.

Our findings can provide a valuable foundation for the selected brands to craft well-informed and consistent strategies tailored to their unique strengths and market positioning. Additionally, these findings highlight key areas where each brand can improve, whether by enhancing their product development processes, investing in more innovative solutions, or refining their marketing strategies to more effectively communicate their value propositions.

Sustainability is playing an increasingly pivotal role in shaping consumer behaviour across various industries, including the pet food market. Our findings highlight the growing importance of this factor, particularly among younger generations, who demonstrate the highest appreciation for sustainability and a greater willingness to pay a premium for such products. However, despite this trend, our results reveal that Portuguese consumers, as a whole, are not yet prepared to translate their concern for sustainability into a willingness to pay higher prices for sustainable dog food options.

Overall, our thesis provides important insights into the key attributes influencing the decision to purchase dog food among Portuguese consumers, highlighting the importance of a deeper understanding of consumer behaviour and preferences. It is a comprehensive solution that balances functionality, cost performance and environmental awareness. It can appeal to consumers who are concerned about the long-term health of their pets. By building consumer trust in the brand, the perfect product can also form a long-term emotional connection and

resonance with consumers, consolidate its market position, and win long-term loyalty and support from consumers.

Ultimately, this thesis provides practical and guiding insights for companies, policy makers and researchers to contribute to relevant discussions and drive product optimization and development in the dog food market. In the context of today's increasing focus on sustainable development, it provides guidance for dog food industry practice and brand strategy. Additionally, our research addresses a gap by providing further and distinct investigation into consumer preferences in the Portuguese dog food market, providing new perspectives and insights into this underexplored industry.

5. Managerial Implications

The research provided valuable findings into consumer behaviour and preferences, in the Portuguese pet food market, that can be translated into actionable strategies. Those implications relate to the study outcomes by investigating the attributes in consideration, including availability, health benefits, organic quality, price, and sustainability.

Price is considered a significant factor for consumers, still, there is a consumer segment willing to pay a premium for products that deliver enhanced value through attributes such as health benefits, sustainability and organic quality. Having in mind those different consumer segments, companies should consider implementing tiered pricing strategies to attract and retain a wide range of consumer segments (Nagle and Müller 2017, 45). Consequently, higher-income consumers who focus on superior quality and personalised features can buy premium product lines, while more affordable options can attract cost-conscious buyers while maintaining essentials. Thus, for companies to capture a broader market share it is crucial to balance quality and price while considering the diverse needs of the Portuguese pet food market (Springer 2013).

The results revealed the increasing relevance of health benefits in dog food. Considering that finding, companies should develop and prioritize products that respond to certain dog health needs such as digestive health, joint care, and weight management. Focusing on the pet owners' segment who highly value their pet's well-being, products enriched with functional nutrients and tailored formulations can impress those consumers. Furthermore, marketing strategies should emphasize these health-related attributes, effectively communicating their value to consumers and reinforcing those products' role in enhancing pet's quality of life (Kotler and Keller 2016).

Additionally, the findings underscored the growing importance of sustainability as a determinant factor in the dog food market. To meet the expectations of environmentally conscious consumers, companies must integrate sustainable practices throughout their operations. Those practices include implementing recyclable packaging, minimising carbon footprint and source ingredients ethically. This not only constitutes a response to the eco-conscious demand but can serve as a key differentiator. In addition, transparently communicating those sustainable efforts can empower consumer trust and foster long-term loyalty (Verhoef and Bügel 2017; Nuttavuthisit and Thøgersen 2017). Thus, dog food brands should optimise brand positioning to attract target customers more effectively.

While these attributes are important, another relevant factor is product availability, impacting the business success as highlighted by the research findings. To satisfy the different consumer expectations, companies must invest in comprehensive distribution networks that seamlessly combine online and offline channels (Verhoef, Wagner, and Herhausen 2021; Piotrowicz and Cuthbertson 2019). E-commerce popularity constitutes an opportunity to attract tech-savvy consumers who value convenience. At the same time, maintaining a strong presence in physical stores responds to the traditional buyers' expectations (Grewal, Roggeveen, and Nordfält 2017). A carefully designed distribution strategy not only improves accessibility but

also minimises the risk of customer attrition due to stock shortages, fostering trust and reliability (Verhoef, Wagner, and Herhausen 2021; Piotrowicz and Cuthbertson 2019).

Simultaneously, organic considerations are becoming increasingly influential in driving consumer purchasing decisions. Consequently, leveraging certifications and transparent labelling is crucial to bolster consumer confidence and brand credibility (Jahn, Schramm, and Spiller 2005; Wognum et al. 2011). By positioning themselves as champions of responsible and organic resources, companies can foster lasting loyalty and build ethical relationships with the audience (Verhoef and Bügel 2017; Nuttavuthisit and Thøgersen 2017).

Additionally, our analysis reveals valuable insights into consumer perceptions and preferences in the Portuguese pet food market, focusing with four selected brands. By understanding the unique strengths and challenges of Advance, Por Si, Purina and Royal Canin we would like to propose specific solutions to enhance their positioning, meet consumer needs, and capitalize on market opportunities effectively.

Royal Canin demonstrate a strong position, emphasizing it as a trusted choice for discerning pet owners. To sustain this leadership, the brand should continue prioritizing veterinary-endorsed, evidence-based formulations while investing in advanced products that address niche health concerns, such as aging pets and breed-specific needs. It's crucial to emphasize its premium quality by integrating clear messaging around scientific excellence, quality assurance, and veterinary trust. Campaigns should focus on storytelling that highlights tangible outcomes, such as improved health, vitality, and pet longevity, creating an emotional connection with consumers while reinforcing the brand's role as a reliable solution for their pets' well-being.

Advance seems to hold a positive position in the market but falls short of Royal Canin, to bridge this gap, Advance should focus on enhancing product innovation by introducing a wider range of flavours and formulations tailored to specific health needs. Improving the brand's scientific credibility is also essential, the brand could highlight its commitment to science-based

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production through transparent communication of its research and product development processes. Collaborating with veterinarians and nutritionists to endorse and validate its products can build trust and position the brand as a more credible alternative. Additionally, increase familiarity among consumers is crucial, which can be achieved through targeted marketing campaigns focusing on its key strengths, such as balanced nutrition and functional health benefits.

Purina should address weaker perceptions around scientific credibility and premium quality, two attributes that are particularly important in the actual pet food market. By expanding its portfolio of health-oriented formulations, including those targeting specific nutritional needs or health concerns, Purina can align itself more closely with consumer expectations in these areas. This approach should be supported by transparent and informative communication, which can help reinforce trust and reliability. To differentiate itself further in a crowded market, where we found brands like Advance and Royal Canin, Purina should also aim to establish greater distinctiveness. Which may include offer sustainable options, like refillable packaging or upcycled ingredients, to further enhance its appeal to sustainability-focused consumers.

Finally, to improve its brand perception, PorSi should focus on enhancing product value by developing cost-effective yet credible formulations that address basic pet health needs, such as balanced nutrition, digestive support, and weight control. To bridge the gap in reputation and trustworthiness, PorSi must implement targeted marketing campaigns that emphasize its practicality, reliability, and strong price-to-value ratio. Highlighting its ability to provide essential nutrition at an affordable price will resonate with budget-conscious consumers.

6. Study Limitations

Despite the valuable insights gained from this research, several limitations must be acknowledged to provide context for the results. These study limitations reflect the inherent challenges of conducting consumer research and indicate factors to be improved in future research.

Market Fluctuations

Market dynamics are inherently fluid, as highlighted by the Brookings Institution (2018), markets often experience short-term volatility, emphasizing the importance of considering temporal perspective when analysing market behaviours (Brookings Institution, 2018). In the present thesis, the results are based on cross-sectional data, which can only reflect the preferences of consumers in the specific time under investigation, and consumer behaviour may change with changes in social values, market trends, and brand marketing strategies, resulting in a lack of dynamic perspective.

Secondary Data Bias

The use of secondary data, such as articles and academic papers, can distort the evidence base. Substantial gaps and limitations in datasets may introduce biases in research findings (Baldwin, Murray, and Widaman 2022). Moreover, secondary data may also lack granularity or relevance to certain markets, impacting the accuracy of the analysis and conclusions (Gaffney and Matias 2018).

Online Survey Distribution Bias and Survey Scope

The use of online survey distribution channels including Google Forms, social media platforms, and messaging apps like WhatsApp, introduces potential biases in the sample population. While these online channels are effectively reaching a larger audience, they may overrepresent younger, tech-savvy individuals who are frequent internet users (Statista, 2023).

Consequently, this survey distribution method can inadvertently exclude older and less digital consumer groups, resulting in sample population bias. These imbalances limit the generalisability of findings across all market segments. Consequently, the conducted surveys may not include the diversity in the Portuguese dog-owning population. Variations in regional, cultural, and socio-economic factors may not be fully represented in the surveys, limiting the generalizability of the results.

Brand Scope

Consumer behaviour in the dog food market is notably varied, shaped by a wide array of brands beyond the selected ones with an increase of pet food brands (Statista 2023). Although, the selected brands are major players in the Portuguese market, excluding smaller competitors may result in a less comprehensive understanding of consumer preferences. By not including a broader range of brands, the survey results can be impacted by the perceptions and preferences of consumers who usually buy other brands' products. Furthermore, this thesis solely explores the Portuguese market, not including other global markets. Following a comparative analysis could have contextualised the results, emphasizing unique or universal trends in Portuguese consumer behaviour. Additionally, it could provide insights that would complete and better justify some findings.

Narrow Focus on Dog Food

Considering adjacent pet categories including treats and accessories, could result in a more holistic approach of consumer behaviour. Despite the substantial growth of the dog food market, certain segments can be considered niche segments (Expert Market Research 2023). This constitutes a constraint in gathering a substantial number of responses from consumers. This limitation brings difficulties in achieving a representative sample size, potentially impacting the generalisability of insights and conclusions drawn from the research.

Additionally, one complexity of the dog food market lies in the fact that the buyer (pet owner) is not the final consumer. Thus, analysing attributes including flavour and texture is a challenge as the preferences of the pet cannot be directly assessed by the owner. Relying on indirect factors such as pets' reactions or veterinary recommendations can introduce bias and an additional layer of complexity.

Lack of Emotional and Psychological Analysis

Even considering emotional and psychological insights from past studies, this research focuses solely on tangible attributes such as availability, health benefits, organic quality, sustainability, and price. Understanding consumer behaviour requires analysing emotional and psychological factors, which provide a more holistic view of consumer decision-making processes (Springer n.d.). In the pet food market context, factors like the emotional bond between owners and their pets can provide valuable insights that influence consumer decisions and, consequently, allow a more comprehensive understanding of consumer preferences.

Lack of Exploration of Emerging Trends

The research did not explore some emerging trends including vegan or insect-based dog food (Verified Market Reports 2023; Allied Market Research 2020). Analysing those innovations could allow a forward-looking perspective on the market while investigating new consumer preferences. Moreover, factors, such as flavour, packaging design, or brand loyalty, were not thoroughly examined. Including these dimensions could provide a more comprehensive understanding of consumer preferences.

Market share

In addition to the previous, conjoint interviews are designed to capture consumer preferences for specific attributes and levels included in the survey, if all brands have the same availability. However, as highlighted by Orme and Johnson, (Orme 2008) in the real world, not

all consumers have the same awareness and knowledge of each brand. For example, advertising or promotions can significantly influence consumer behavior. Moreover, while conjoint analysis reflects potential preferences for a product, it does not necessarily mean that consumers can purchase that product. As such, while conjoint analysis is a useful tool for predicting preference shares, it cannot predict market shares, as it does not capture all factors that can affect consumer behavior.

Drawbacks of Similar Attributes

A significant drawback of this thesis was the high correlation among the evaluated attributes, with $r > 0,95$. From one perspective, it shows that respondents evaluated the attributes uniformly, but on the other hand, it led to an overarching perception of brand quality. While this consistency emphasizes the coherence on consumer perceptions, it also introduced an analytical challenge, as Principal Component Analysis (PCA) could only identify one significant dimension, restricting the ability to uncover nuanced differences between brands.

7. Future Research Suggestions

Considering the outlined limitations, future research could achieve a more thorough understanding of the dog food market by addressing these constraints.

Current research uses static data, while consumer behaviour may adjust dynamically due to changes in social trends, market trends, and brand strategies. Thus, future studies could adopt longitudinal research methods to observe the evolution of consumer preferences over different periods.

Secondly, the sample size should be larger to cover more consumer groups, especially consumers of different ages, incomes, and geographical regions, ensuring the results reflect the Portuguese market diversity. Also, expanding primary data collection methods could diminish the usage of secondary sources, and consequently, minimise biases.

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Additionally, including a wide variety of brands, pet food product categories and emerging trends, could provide a more comprehensive view of consumer preferences. To strengthen findings on consumer preferences, future studies should incorporate emotional and psychological factors. This would shed light on how the bond between pet owners and their pets' influences purchasing decisions.

To conclude, future research could explore other potential drivers of consumer preferences, such as environmental awareness, education, and cultural or social influences, to better understand the factors underpinning consumer decisions in the dog food market.

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9. Appendix

Figure 8: Survey Design – Perceptual Mapping and Bonus Question

Section	Question
1.Screening Questions	1. Do you have or recently had a dog?
	2. Do you buy dog food in Portugal?
2.Brand Familiarity and Attribute Ratings	3. Which of the following dog food brands are you familiar with? Please select all that apply.
	4. Science-Based: From 1 to 5 (1 being the lowest and 5 the highest) how science-based is the brand for you?
	5. Innovation: From 1 to 5 (1 being the lowest and 5 the highest) how innovative is the brand for you?
	6. Premium: From 1 to 5 (1 being the lowest and 5 the highest) how premium is the brand for you?
	7. Nutritive Balanced: From 1 to 5 (1 being the lowest and 5 the highest) how nutritive-balanced is the brand for you?
	8. Trustworthiness: From 1 to 5 (1 being the lowest and 5 the highest) how trustworthy is the brand for you?
	9. Attractiveness: From 1 to 5 (1 being the lowest and 5 the highest) how attractive is the brand for you?
	10. Reputation: From 1 to 5 (1 being the lowest and 5 the highest) how good reputable is the brand for you?

	11. Informative From 1 to 5 (1 being the lowest and 5 the highest) how informative is the brand for you?
	12. Flavour Variety: From 1 to 5 (1 being the lowest and 5 the highest) how flavour varied is the brand for you?
3.Sustainability	13. Suppose your preferred dog food brand offered a sustainable product at a slightly higher price. Would you be interested in buying it?
	14. How much do you usually pay for a 10kg package of dry food?
	15. How much more would you be willing to pay for this sustainable dog food compared to your current choice? (consider a 10kg package of dry food)
	16. Would you consider try a different brand if it offers only sustainable dog food options?
4.Demographics	17. How old are you?
	18. What is your current occupation? (Please select the option that best describes your situation)
	19. What is your current monthly gross base salary? (Please select the range that best applies)

Figure 9: Age Groups Distribution (%)

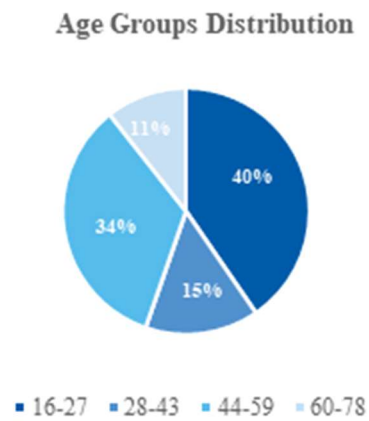


Figure 10: Occupation Groups Distribution (%)

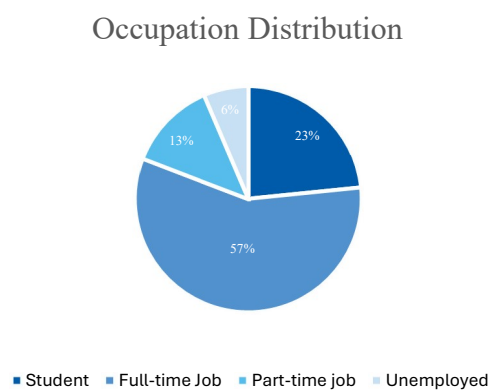


Figure 11: Income Groups Distribution (%)

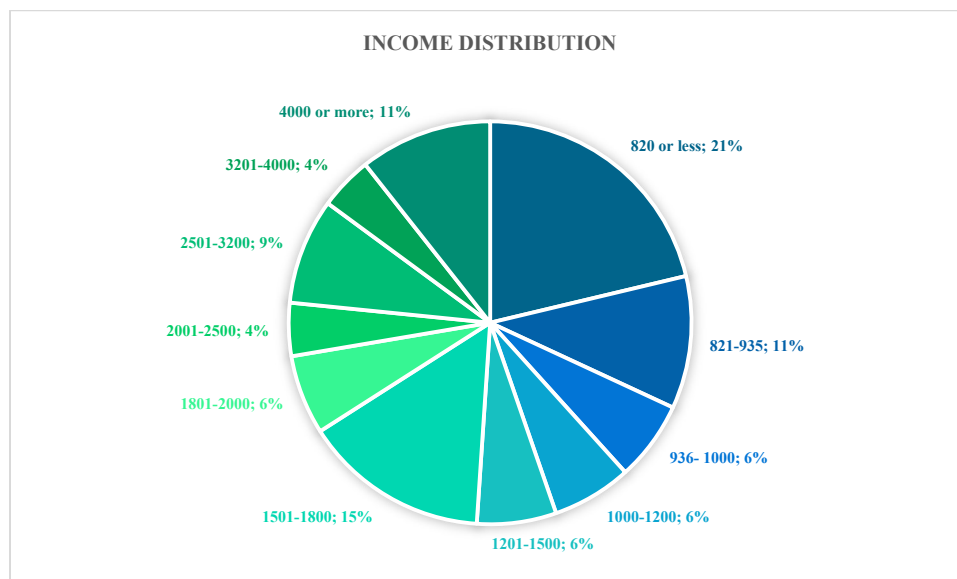


Figure 12: Familiarity with the Brand (% of respondents)

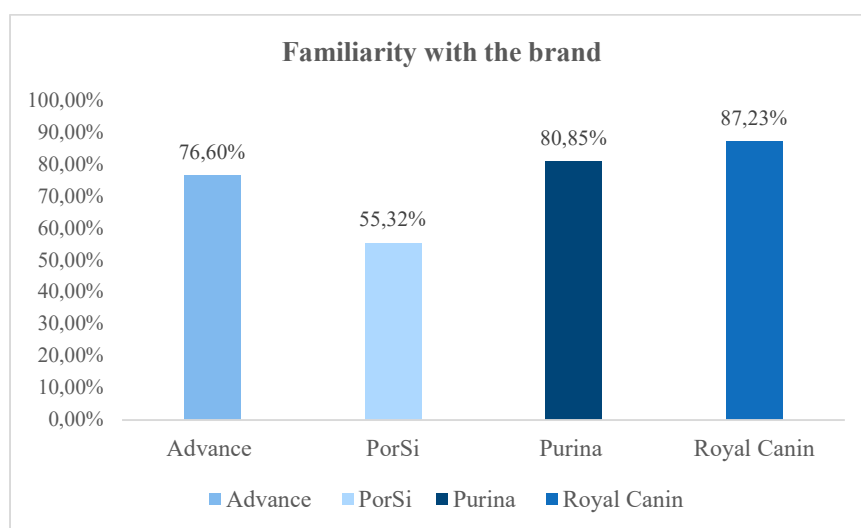


Figure 13: Brand-Attribute Scores - Direct Comparison: Advance vs Royal Canin

	Dimension 1				Dimension 2				
	Science-based Production	Innovation	Nutritive-Balanced	Flavour Variety	Premium	Trustworthiness	Attractiveness	Reputation	Informative
Advance	3,723	3,511	3,681	3,553	3,553	3,830	3,468	3,830	3,638
Royal Canin	4,043	3,766	3,957	4,000	4,043	4,149	3,979	4,319	4,000
Δ	-0,319	-0,255	-0,277	-0,447	-0,489	-0,319	-0,511	-0,489	-0,362

Figure 14: Brand-Attribute Scores - Direct Comparison: Purina vs Advance

Group Part

	Dimension 1				Dimension 2				
	Science-based Production	Innovation	Nutritive-Balanced	Flavour Variety	Premium	Trustworthiness	Attractiveness	Reputation	Informative
Purina	3,489	3,532	3,489	3,787	3,362	3,596	3,532	3,574	3,362
Advance	3,723	3,511	3,681	3,553	3,553	3,830	3,468	3,830	3,638
Δ	-0,234	+0,021	-0,191	+0,234	-0,191	-0,234	+0,064	-0,255	-0,277

Figure 15: Brand-Attribute Scores - Direct Comparison: Purina vs Royal Canin

	Dimension 1				Dimension 2				
	Science-based Production	Innovation	Nutritive-Balanced	Flavour Variety	Premium	Trustworthiness	Attractiveness	Reputation	Informative
Purina	3,489	3,532	3,489	3,787	3,362	3,596	3,532	3,574	3,362
Royal Canin	4,043	3,766	3,957	4,000	4,043	4,149	3,979	4,319	4,000
Δ	-0,553	-0,234	-0,468	-0,213	-0,681	-0,553	-0,447	-0,745	-0,638

Figure 16: Willingness to Pay a Premium for a Sustainable Dog Food: Descriptive Statistics

Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
WTP	47	,00	20,00	5,7447	4,97043	24,705
Valid N (listwise)	47					

Figure 17: Distribution of the Amount Usually Paid for a 10kg Package of Dry Food

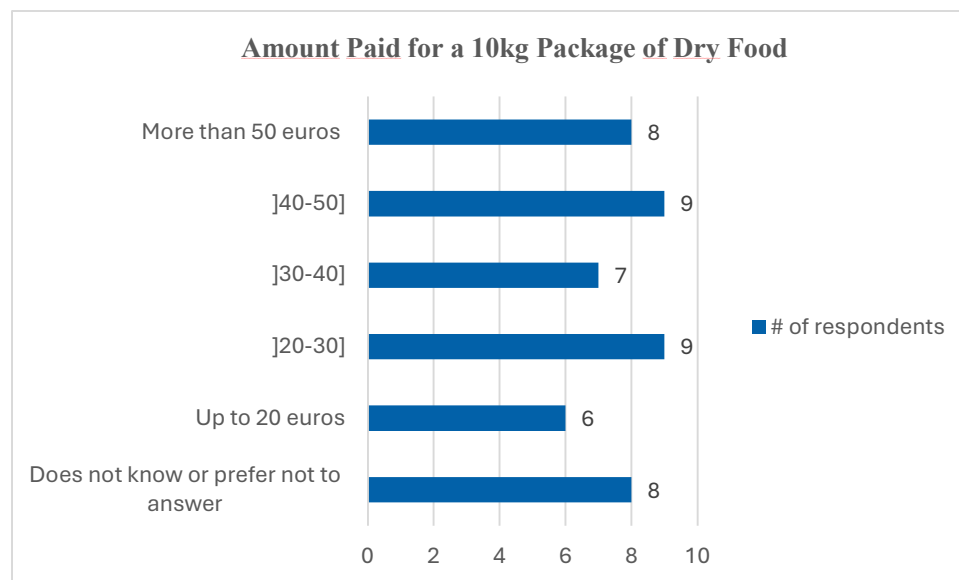


Figure 18: Willingness to Pay a Premium for a Sustainable Dog Food - Distribution for Age Groups: Descriptive Statistics

Descriptives								
Amount_Willing_to_Pay								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
[16-27]	19	6,0526	4,88164	1,11993	3,6998	8,4055	,00	15,00
[28-43]	7	5,3571	4,19041	1,58383	1,4817	9,2326	,00	10,00
[44-59]	16	5,6250	4,60977	1,15244	3,1686	8,0814	,00	15,00
[60-78]	5	5,5000	8,36660	3,74166	-4,8885	15,8885	,00	20,00
Total	47	5,7447	4,97043	,72501	4,2853	7,2041	,00	20,00

Figure 19: Willingness to Pay a Premium for a Sustainable Dog Food - Distribution for Occupation Groups: Descriptive Statistics

Descriptives								
WTP								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Student	11	5,4545	4,15605	1,25310	2,6625	8,2466	,00	15,00
Part-time Job	6	3,3333	4,08248	1,66667	-,9510	7,6176	,00	10,00
Full-time Job	27	6,7593	5,45148	1,04914	4,6027	8,9158	,00	20,00
Unemployed	3	2,5000	2,50000	1,44338	-3,7103	8,7103	,00	5,00
Total	47	5,7447	4,97043	,72501	4,2853	7,2041	,00	20,00

Figure 20: Willingness to Pay a Premium for a Sustainable Dog Food - Distribution for Income Groups: Descriptive Statistics

Descriptives								
WTP								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
820 or less	10	5,2500	4,77988	1,51153	1,8307	8,6693	,00	15,00
821-935	5	6,0000	3,79144	1,69558	1,2923	10,7077	2,50	10,00
936-1000	3	5,0000	5,00000	2,88675	-7,4207	17,4207	,00	10,00
1001-1200	3	5,8333	3,81881	2,20479	-3,6531	15,3198	2,50	10,00
1201-1500	3	5,0000	8,66025	5,00000	-16,5133	26,5133	,00	15,00
1501-1800	7	6,4286	4,53163	1,71280	2,2375	10,6196	,00	12,50
1801-2000	3	5,8333	8,03638	4,63980	-14,1301	25,7968	,00	15,00
2001-2500	2	7,5000	3,53553	2,50000	-24,2655	39,2655	5,00	10,00
2501-3200	4	5,6250	3,75000	1,87500	-,3421	11,5921	,00	7,50
3201-4000	2	7,5000	3,53553	2,50000	-24,2655	39,2655	5,00	10,00
4000 or more	5	5,0000	8,66025	3,87298	-5,7531	15,7531	,00	20,00
Total	47	5,7447	4,97043	,72501	4,2853	7,2041	,00	20,00