The effect of advertising on consumers' Perceptions and Consumption Intention of plant-based products: A Comparative study among Meat and Non-Meat Eaters

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Abstract

The global shift towards more conscious consumption has also led to a change in people's eating patterns, which has allowed growth in the market for plant-based products and with this a re-evaluation of consumer behavior towards meat substitutes. In this transition, the role of advertising could be fundamental to generating positive perceptions and influencing consumer choice.

This study, entitled "The Effect of Advertising on Consumer's Perception and Consumption Intention of Plant-based Products: A Comparative Study among Meat and Non-Meat Eaters", examines three perceptions that are fundamental when making a dietary change to plant-based products: environmental, ethical, and health. The main objective is to assess the relationship between these perceptions, based on advertising, and consumption intentions, while exploring the differences between two distinct groups of consumers: those who consume meat and those who opt for non-meat alternatives.

Grounded on a quantitative study through the means of an online survey, demographic factors have shown to play an important role in consumer perceptions of plant-based food. We concluded there is a positive relationship between environmental perceptions of plant-based food and the intention to consume those products. This finding is empirically reinforced by the current trend toward more conscious consumption. However, ethical and health perceptions, as well as consumer type, did not show to have a significant relationship with the intention to consume these products. Our research highlights the diversity of factors influencing consumption decisions for plant-based products.

Keywords: Environmental perception, Ethical perception, Health Perception, Consumption Intention, Plant-based products

Resumo

A mudança global para um consumo mais consciente também levou a uma alteração dos padrões alimentares das pessoas, o que permitiu o crescimento do mercado de produtos à base de plantas e, com isso, uma reavaliação do comportamento dos consumidores em relação aos substitutos da carne. Nesta transição, o papel da publicidade pode ser fundamental para gerar percepções positivas e influenciar a escolha do consumidor.

Este estudo, "The Effect of Advertising on Consumer's Perception and Consumption Intention of Plant-based Products: A Comparative Study among Meat and Non-Meat Eaters", examina três percepções que são fundamentais quando se faz uma mudança alimentar para produtos à base de plantas: ambiental, ética e de saúde. O principal objetivo é avaliar a relação entre estas percepções, baseadas na publicidade, e as intenções de consumo, explorando as diferenças entre dois grupos distintos de consumidores: os que consomem carne e os que não consomem

Baseado num estudo quantitativo. Os factores demográficos têm demonstrado desempenhar um papel importante nas percepções dos consumidores sobre os alimentos de origem vegetal. Concluímos que existe uma relação positiva entre as percepções ambientais dos alimentos à base de plantas e a intenção de consumir esses produtos. Esta conclusão é reforçada empiricamente pela tendência atual para um consumo mais consciente. No entanto, as percepções éticas e de saúde, bem como o tipo de consumidor, não mostraram ter uma relação significativa com a intenção de consumir estes productos.

Palavras-chave: Perceção ambiental, Perceção ética, Perceção de saúde, Intenção de consumo, Produtos à base de plantas

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1 INTRODUCTION

The challenges and impact experienced on a worldwide scale have led to changes in consumption patterns. These changes have encouraged people to contemplate the idea of more conscious consumption and to carefully consider the ethical, environmental, health, and other implications. (Tsarenko et al., 2013). Within these ideas of conscious consumption, changes in food diets involving plant-based products have been one of the most noticeable, creating evolutions not only in the food industry but also in consumer behavior(Batista et al., 2023). As a result of this transformation, the role of meat substitute advertising in influencing consumer attitudes, perceptions, and choices is becoming increasingly relevant.

In recent years, much academic research has been devoted to understanding consumer reactions to plant-based products(Bryant, 2022; White et al., 2022). However, the academic landscape is still marked by significant gaps, particularly around consumer reactions to plant-based meat substitute advertising. These gaps are even more pronounced when considering the different consumer segments that exist. This research aims to bridge this gap by focusing on the role of advertising as a critical intermediary in shaping consumer choices about meat alternatives. Through detailed research and thorough analysis, this thesis aims to make a significant contribution to a better understanding of this field of study.

This dissertation, entitled "The Effect of Advertising on Consumer's Perception and Consumption Intention of Plant-based Products: A Comparative Study among Meat and Non-Meat Eaters", studies in-depth the behavior of two types of consumers: those whose diets include animal meat (meat consumers) and those whose diets are based on meat alternatives called non-meat consumers. It explores how these two segments react, delves into the perceptions and consumption intention that influence responses to plant-based products advertising and what are the similarities and differences between them. This comparative approach provides significant knowledge and valuable insights regarding consumer behavior toward food advertising in an era marked by dietary transitions. By recognizing the diversity of factors that potentially affect consumer behavior, we aim to uncover the unique factors and motivations that drive consumer choices in the context of meat alternative food advertising.

As a result, this research will primarily focus on the impact that has one of the external factors: advertising. Considering the growing global importance of sustainability and its impact on food

choices, this study is not only an academic contribution but also offers practical ideas for business, it helps to understand how advertising can effectively influence consumers to adopt or choose plant-based foods and offers valuable ideas that aim to appeal to both meat and non-meat eaters. This topic is widely recognized for its potential in promoting environmental sustainability and raising awareness about health considerations (Rosenfeld et al., 2022). and consequently, can have a significant impact on either driving an increase or facilitating a decrease in plant-based food consumption and understanding consumer perceptions *(including perceived benefits and costs)*(Segijn & van Ooijen, 2022). and attitudes *(comprising beliefs, feelings, and behavioral intentions)* towards meat substitute food advertising is therefore of vital importance in the evolving landscape of the global food market.

This study can help identify opportunities and challenges in these markets and thus create marketing strategies, allowing companies to tailor their messages and rethink advertising tactics to reach their target audiences effectively.

The research aims to provide an answer to the following questions:

1) *RQ1: How do non-meat consumers and meat consumers differ in their **perceptions** of plant-based food formed based on advertising?*
2) *RQ2: What roles do demographic factors such as age, gender, and income play in consumer **perceptions** of plant-based food after an advertising exposure in both groups?*
3) *RQ3: Are there specific **messaging strategies or themes** that impact differently on the intention to consume plant-based food among meat and non-meat consumers?*

This thesis is structured in five main parts. The first part provides a brief description of the topic and the research problem to be addressed. The second part focuses on the review of existing literature related to plant-based products, consumer behavior and exposure to advertising of new products. The third chapter details the methodology employed in our research, where a quantitative study was conducted for the purpose of measuring variables, test hypotheses and uncovering patterns of behavior. Chapter four presents the analysis of the data; the description of the results obtained and explains the validation or not of the hypotheses. Finally, the fifth chapter presents the discussion of the results found, explaining the discrepancies between what was expected and what was actually found, highlights the conclusions and main contributions of our study, while also addressing its limitations and leaving some suggestions for future research in this field.

2 LITERATURE REVIEW

In this section an overview of the literature on current trends in new dietary patterns and the important role of advertising. We then discuss the perspectives of two different groups of consumers, meat-eaters and non-meat-eaters, in relation to the adoption of plant-based products. Finally, we review the literature relating to advertising perceptions and consider their relevance in the context of vegetable product advertising.

2.1 Overview of plant-based food trends

According to an epidemiological study(Richi et al., 2015), there is an association between prolonged consumption of red meat and an increase in certain deadly **health** risks, such as cardiovascular disease, some forms of cancer, including colon cancer, and type 2 diabetes. Even though meat provides a rich array of nutrients, including protein, vitamins A-1, B-1, B-12, iron, zinc, and other micronutrients (Richi et al., 2015). In addition, the **environment** is also affected by meat consumption, as meat production is associated with pollution through the use of fossil fuels and the consumption of water and land(Petrovic et al., 2015). Therefore, the most effective way to mitigate the environmental damage and deadly health risks to humans related to meat consumption requires a reduction in the consumption of animal food products (Collier et al., 2021). Meat alternatives are experiencing a significant surge in popularity on a global scale, driven by growing ethical, environmental, and health-related concerns.

Furthermore, an array of global challenges, including climate change, conflicts, rapid population growth, and recurring epidemics, has compelled humanity to adopt conscientious behaviors and habits that lead them to act more sustainably and healthily allowing them to emerge, support, and remain in different scenarios(Hassoun et al., 2022). One pivotal consequence of these challenges has been the transformation of the food supply chain, and this has led consumers to evolve and cope with the situation. In response, consumers have undergone a significant evolution in their choices. A notable trend has emerged as a solution to supply chain gaps: the transition from animal-centric diets to plant-based or non-animal alternatives. This shift represents a fundamental change in consumer behavior, driven by considerations of sustainability, health, and adaptability in an ever-changing world (Hassoun et al., 2022).

2.1.1 The Transition from Meat-Centric to Plant-Based Diets

A "plant-based diet" means that the basis of the diet consists primarily of plant-based foods, such as fruits, vegetables, whole grains, legumes, nuts, and seeds. However, the term "plant-based diet" is not necessarily associated with being vegetarian or vegan, although it may include people who follow these dietary philosophies (Corrin & Papadopoulos, 2017).

Switching from diets centered around animal meat to plant-based foods is widely regarded as a positive transition, benefiting personal **health**, the **environment, and ethical values** (Craig et al., 2021; Dagevos, 2021). It has been determined that plant-based products play a much more decisive and growing role in making dietary changes aimed at improving the earth and human beings and thus generating sustainability (White et al., 2022). The choices consumers make regarding their dietary preferences, whether favoring meat or meat substitutes, are influenced by several factors. These include personal, socio-cultural, and external influences, which encompass a range of considerations, including environmental concerns, health consciousness, and ethical principles (Fresán et al., 2020).

Many individuals often make the transition to a plant-based lifestyle during adulthood, a decision profoundly determined by their interests and inclinations (Craig et al., 2021). This shift is not just a matter of food preferences but often reflects broader psychological developments in the relationship with food. In the process of entering adulthood, people experience an adjustment in maturity and change in tastes, but people bring with them food memories that they carry from their early formative years (von Essen, 2021). As people progress through adulthood, they develop a greater awareness and recognition of the benefits of food, and many begin to adopt more balanced diets and align their food choices with their values and beliefs, aspiring to a longer, **healthier**, and more **sustainable** life, while remaining concerned about change in the world (Craig et al., 2021).

The adoption of plant-based diets varies significantly by geographical location, but globally, the percentage of people following such diets is generally around 10%. In different regions of the world, the prevalence of vegetarian and vegan diets may be higher or lower due to cultural, religious, **ethical** values, and personal factors (Craig et al., 2021). For instance, in Western societies, the percentage of individuals choosing not to include meat in their diets typically remains below 5% (Krithiga Shridhar et al., 2014). Conversely, in countries with rich cultural and religious traditions such as India, the adoption of meat-free diets is considerably more widespread. Statistics

indicate that it is about 35% (Krithiga Shridhar et al., 2014).. This significant contrast and percentage difference in dietary choices in these regions reflects the **ethical** and moral influence embedded in the culture, which promotes the choice of diets that respect certain ethical and spiritual principles, which are deeply ingrained in the traditions of the countries and passed down through the generations. In many cultures, vegetarianism is an intrinsic part of their religious traditions and beliefs, which has driven a more widespread adoption of this lifestyle from an early age (Krithiga Shridhar et al., 2014).

2.1.2 Industry Challenges in the New Consumer Era

As the gradual transition from meat consumption to plant-based products increases, the market faces the challenge of adapting to this new consumer behavior. Improving the development of more protein-rich products becomes a major challenge, bearing in mind that the product must be good for **health** and the **environment** but also align with values that reflect **ethical** and conscientious choices (Puteri et al., 2023). Those following this kind of diet often seek meat substitutes in the market as part of their commitment to reducing their consumption of animal products (Corrin & Papadopoulos, 2017).

For companies, the way they promote these products becomes essential, as it must evolve in line with changing trends in food consumption. In addition, it is equally important for companies to understand the perceptions and attitudes that consumers have toward advertising to create highly effective advertising campaigns (Corrin & Papadopoulos, 2017).

For frequent meat eaters, their experiences with new meat-free products have improved markedly between 2019 and 2020, and a notable peak was observed during this period, marking a pivotal year for innovation in the meat industry Furthermore, this period has seen significant advances in terms of both variety and quality, leading to the development of increasingly innovative and appealing meat substitute products (van Dijk et al., 2023).

2.2 Perceptions

First of all, it is important to have a good understanding of what perceptions are and how they are formed, in order to go into detail on how to connect perceptions with plant-based products.

Perception refers to the way in which a person obtains and grasps certain information, processing the information and sending it to the brain for interpretation and understanding; it is an immediate and ephemeral response that is processed (de Araújo et al., 2022). This perception is influenced by sensory stimulation and the context and can vary from one situation to another.

2.2.1 Perceptions toward plant-based products/diets.

According to several studies, vegan diets, which consist exclusively of plant-based foods, are often perceived as less permissive than vegetarian diets that allow certain animal products (excluding meat) (Corrin & Papadopoulos, 2017). In addition, these diets in general are often associated with connotations such as austerity, faddishness, and emotionalism, and sometimes labels of extremism or hostile attitudes are attached to them. The media tends to discredit veganism by ridiculing it or deeming it difficult or impossible to maintain in practice (Cole & Morgan, 2011).

Some "positive" aspects of vegan diets to highlight are the ethical basis of non-violence, compassion, or anti-speciesism, which is to advocate equal moral consideration of all animal species, regardless of the species that sustain them. Research also indicates that consumers of vegan diets perceive their diets as aesthetically preferable and relatively undemanding, even though veganism is commonly associated with an ascetic image (Cole & Morgan, 2011). Other studies report that diets that are plant-based or incorporate meat substitutes are generally perceived as healthier choices, and are significantly correlated with nutritional knowledge, and that people associate them with attributes such as seeking to preserve the environment, a love of animals, thoughtful decision-making, and a hipster approach.(Corrin & Papadopoulos, 2017; Tso & Forde, 2021).

In general, plant-based diets tend to be well perceived from the outside, as they are seen as diets with an **environmental** focus, based on **ethics** and **health** concerns for the good of others, and those who experience them also make positive comments and express that they are flexible, undemanding and fulfilling diets that are in line with their preferences and personal values (Corrin & Papadopoulos, 2017).

2.2.2 Meat Consumer's perceptions toward plant-based products.

Studies show that the more consumers are attached to meat, the less willing they are to reduce their level of meat consumption (van Dijk et al., 2023). Furthermore, when persuaded by initiatives

promoting reduced meat consumption, some meat consumers may activate defense mechanisms, which, in turn, can intensify their aversion to reducing meat intake and provide justification for increased meat consumption (van Dijk et al., 2023). Even so, many meat consumers experience negative reactions such as guilt related to meat consumption, and the predominant role of meat in the menu is facing growing challenges (Graça et al., 2015). Moreover, individuals who typically consume meat frequently exhibit limited receptiveness to meat substitutes, primarily attributed to food neophobia, "Neophobia" is the fear or aversion to new or unfamiliar things, so this negatively influences the purchase intention of new testers of meat substitutes or plant-based meat (Białek-Dratwa et al., 2022). Additionally, meat consumers tend to have low expectations regarding the sensory excellence of vegetable alternatives, and the perception of high prices also influences their opinion, creating a barrier to consumption (Moss et al., 2023). However, as mentioned above, this has changed considerably thanks to changes in the meat industry (van Dijk et al., 2023).

On the other hand, when it comes to consumers who do not have such a high level of attachment to meat, being somewhat more informed about the adverse effects of meat and the benefits of changing their eating habits to a plant-based diet, they are more open to making changes in their diet or at least giving new foods a chance (van Dijk et al., 2023).

Some studies have identified multiple factors that influence the decision to switch from meat-based to plant-based products Ares, Corrin, Fresán, and Van Dijk said that this decision covers personal, cultural, demographic, and external aspects (Ares & Gámbaro, 2007; Corrin & Papadopoulos, 2017; Fresán et al., 2020; van Dijk et al., 2023). For example, one of them highlights that women prefer products with low-cost and non-**environmental** implications, as it works as a key motivator for their food choices, more specifically to decide if they want to base their diet on meat or plant-based products. In addition, factors such as gender, income, age, food neophobia, concern for the environment, and **health** information are of great relevance when it comes to switching from a meat-based to a plant-based diet (van Dijk et al., 2023).

Furthermore, it is essential to emphasize the significant impact of socio-economic factors on the transformation of dietary habits. These factors encompass economic status, race, ethnicity, religion, health condition, access to a diverse range of food options, and culinary expertise. These elements play a pivotal role in shaping individuals' decision-making processes concerning food choices and

the potential adoption of plant-based products. Depending on these factors, individuals may develop a willingness to try plant-based options (Eckl et al., 2021).

2.3 The Role of Advertising

Currently, advertising plays an essential role in business by attracting and captivating new consumers (George Assaf et al., 2015). In a highly competitive market, advertising strategies have become essential for the survival and growth of companies(Shan et al., 2023). Advertising not only serves the function of informing and engaging consumers about products and services but also has the power to transform that information into a concrete intention, particularly a purchase intention or a willingness to try. By achieving this distinction, advertising enhances market awareness, contributes to brand awareness, strengthens brand recall, and ultimately establishes meaningful connections with consumers(George Assaf et al., 2015).

It is essential to create strategies to ensure effective advertising, which helps to persuade and create sufficient motivators. It can also be perceived in a positive way to generate beneficial results, such as making a purchase, interest in trying a product or service, or spreading the message to more people or at least remaining with a positive attitude towards it (Hammami, 2023). For this, it is essential to ensure that advertising is aligned with the surrounding environment, is credible, appealing, and can awaken the consumer's desires by provoking an intention in the consumer or user.(HudĂˇk et al., 2017). Advertising has the power to create and shape consumer desires by linking products or services to the satisfaction of those desires (Gustafson, 2001). It achieves this through captivating imagery, compelling messages, and marketing strategies that establish a strong connection between the product or service and the satisfaction of the consumer's needs and desires. However, in some cases, this influence can be so powerful that consumers may feel they are being "manipulated" by advertising or commented upon as "unbelievable or overdramatized" (Eze & Lee, 2012).

In the field of marketing, it is crucial to have a deep understanding of how people perceive or will perceive the various stimuli that reach them through advertising (HudĂˇk et al., 2017).

2.4 The Impact of Advertising on Consumers' Perceptions.

Advertising has the power to shape consumers' perceptions, attitudes, and purchasing decisions. Its impact can influence the way people perceive a product (Rupam Soti, 2022). The impact of an advertising piece depends on several key factors, such as creativity, relevance, appeal, comparisons, exposure, emotions generated, source credibility, and others (DeBono & Packer, 1991; Gorn & Weinberg, 1984; Kelly et al., 2002; Mosa, 2021; Wang et al., 2022).

Advertising is created with a set of elements that combine to convey a message, including product information, imagery, message, tone of voice, and creativity, which form a set of elements that induce emotional involvement (Hyun et al., 2011). These elements work together to create emotions, connections, and responses in the audience, which can influence their perceptions. Emotional engagement in an advertisement can change the perceived value of the product for the customer. Also, it plays a key role in the effectiveness of advertising, as it can generate a deeper and more lasting connection between brands and consumers (Otamendi & Sutil Martín, 2020). Emotional response can be measured through a range of positive feelings, such as satisfaction, contentment, hopefulness, relaxation, and happiness (Hyun et al., 2011).Furthermore, emotional reaction measures the feelings that consumers experience when viewing the advertising image, which influences the formation of perceptions of the products/services being advertised. These perceptions, generated by consumers' emotional reactions, lead to consumers positive or negative attitudes towards the product/service, which in turn may lead to a consumption intention. (Hyun et al., 2011).

2.4.1 Environmental focus perception

Emotional involvement with advertising can potentially lead to a perception of environmental awareness and responsibility. Emotional advertisements that generate strong feelings can help consumers to identify plant-based products as having ecological characteristics, such as pollution reduction, sustainable development or environmental awareness, and this emotional involvement can influence consumers' perception that plant-based products are beneficial for the environment (Bi et al., 2023).

Hence, we formulate the following hypothesis:

H1: Perceptions of plant-based products as being environmentally conscious (after exposure to advertising) lead to a positive consumption intention (among both non-meat eaters and meat eaters).

2.4.2 Ethical concerns' perception

The emotional connection is a powerful tool for conveying and evoking the ethical aspects of plant-based choices. When advertising generates strong emotions, it can create links such as preventing harm, promoting public welfare, and demonstrating values such as integrity, honesty, diversity, responsibility, quality, accountability, and respect(Kumar et al., 2023). Emotionally connected consumers may perceive plant-based foods as a moral and ethical choice.

Based on the above, we hypothesize:

H2: Perceptions of plant-based products as being ethically driven (after exposure to advertising) lead to a positive consumption intention (among both non-meat eaters and meat eaters).

2.4.3 Health Perception

By evoking positive emotions towards advertising, consumers can become emotionally involved with the ad, and thereby create relationships between plant-based foods and perceptions of wellness and health, associating plant-based foods with improved personal health. According to Kim et (al., 2013) there are 4 fundamental attributes that increase consumers' perceived health value: nutritional information, fresh and natural ingredients, weight control, and a nutritionally balanced diet. The emotional connection with the ad can lead consumers to perceive plant-based foods as a healthy choice. We therefore hypothesize:

H3: Perceptions of plant-based products as being health-focused (after exposure to advertising) lead to a positive consumption intention (among both non-meat eaters and meat eaters).

2.5 Consumption Intention

According to the findings of the study of Shi Wee Mohd Shoki Bin Md Ariff et al., n.d. (2014), purchase or consumption intentions are significantly affected by the perceptions consumers develop in relation to the product. This impact is particularly evident in emotional areas such as health, environmental sustainability, and animal welfare. By forming positive perceptions of these aspects, consumers tend to show a greater predisposition to purchase or adopt the product. On the other hand, the Mandliya et al., (2020) study highlights that environmental knowledge influences the likelihood of purchasing products that support environmental sustainability. Consumers' consumption decisions are influenced by their perceptions, which makes perception crucial for marketers. This is because consumers' choices are based on what they perceive rather than exclusively on fundamental objective facts. Therefore it is important to investigate how people perceive plant-based products in advertising (Mandliya et al., 2020). Purchase or consumption intention is also closely linked to demographic characteristics, and it is possible to identify a profile pattern that aligns with a positive disposition of consumption towards plant-based products (Mandliya et al., 2020). Based on the above, we formulate the following research hypotheses:

H4: The type of consumer (i.e., being meat eater or non-meat eater) moderates the relationship between environmentally conscious perceptions and the consumption intention of plant-based products so that it is stronger for non-meat eaters.

H5: The type of consumer (i.e., being meat eater or non-meat eater) moderates the relationship between ethically driven perceptions and the consumption intention of plant-based products so that it is stronger for non-meat eaters.

H6: The type of consumer (i.e., being meat eater or non-meat eater) moderates the relationship between health-focused perceptions and the consumption intention of plant-based products so that it is stronger for non-meat eaters.

2.6 Conceptual Framework

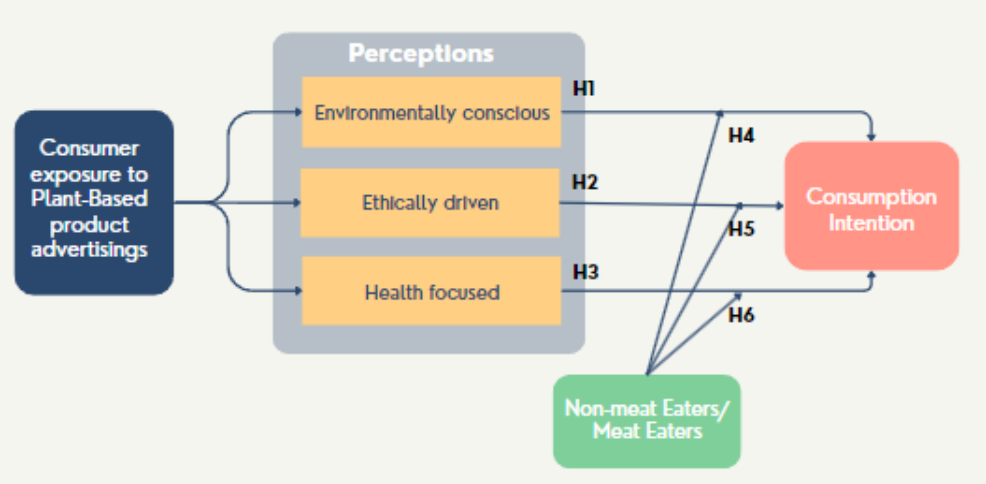
Previous research has identified a variety of perceptions and consumption intentions toward plant-based products (Corrin & Papadopoulos, 2017; Dagevos, 2021; Puteri et al., 2023). However, it is essential to recognize that these perceptions, attitudes, and behaviors may vary considerably in

response to advertising of such products, especially between the two consumer segments (meat eaters and non-meat eaters). These variations may trigger different responses in terms of consumption intention.

Our research aims to examine the impact of perceptions on behavioral intention for two distinct consumer segments, *non-meat eaters and meat eaters,* addressing an important gap in this field of knowledge. The study intends to investigate consumers' perceptions of plant-based products resulting from exposure to advertising for this type of products. It aims to analyze the subsequent development of perceptions and, based on what has previously been said in our literature review, evaluate whether individuals, following exposure to advertising, perceive plant-based food in a particular manner: *as being environmentally conscious, ethically driven, and/or health focused.* Furthermore, it aims to assess whether there is a positive correlation between these perceptions and the *consumption intention*.

Next, we present our conceptual model with the variables in study and the respective hypothesized relationships amongst them.

Conceptual Model



Perceptions:

Our study investigates the manifestation of three dimensions that stand out as the most influential when considering a dietary switch from meat to plant-based products.

Environmental consciousness: This variable assesses how people interpret the ad regarding their commitment to the environment. It focuses on whether the product shown in the advertisement reflects the product's green qualities or a commitment to reducing environmental impact. In essence, it seeks to determine whether plant-based products' advertising leads to perceptions of these products as being responsible and environmentally friendly.

Ethically driven: This perception addresses ethical considerations related to the product shown in the advertisement. It focuses on whether the product is shown with fair practices, cruelty-free, or other ethical principles. This perception explores whether the advertising of plant-based products is perceived as consistent with consumers' values and ethical standards.

Health-focused: This perception relates to how the advertising product is presented regarding health, whether it is perceived as nutritionally positive, or with health benefits. It seeks to determine whether the advertising of plant-based products is perceived as a beneficial choice for consumers' health.

Consumption Intention:

Consumption intention serves as an indicator of the likelihood of specific behavior, in this case, the decision to switch from meat to plant-based products. It reflects individuals' mental predisposition and willingness to make those dietary changes based on their perceptions, specifically environmental consciousness, ethically driven, and health focused.

The moderating effect of types of consumers:

In parallel, our study examines the behavior towards plant-based products of *non-meat eaters and meat eaters* looking at consumers' different responses after advertising and analyzing the similarities and differences between them. We assume that consumer type moderates the relationships between environmental, ethical and health-focused perceptions and the intention to consume plant-based products.

3 METHODOLOGY

In this chapter, we describe the methodological approach used to conduct our research. The main objective of the empirical study was to provide answers to the research questions and to test the hypotheses formulated in the previous chapter. We present a detailed explanation of the methodology applied both in the data collection process, and in data analysis.

3.1 Research approach

A quantitative methodology was used in this study in order to measure the variables, identify patterns or relationships between them, and test the research hypotheses. The data were collected through an online survey developed using Qualtrics software and distributed through social networks, where we tried to reach as many people as possible through WhatsApp, Instagram, and Facebook. The length of the questionnaire was estimated to be approximately 5 minutes and it was administered to people between the ages of 15 and 70. This age group covers a wide range of potential consumers, with 2 types of dietary preferences: meat Consumers and non-meat consumers. The first subgroup includes individuals who regularly consume meat or animal products as part of their diet. The second group is constituted by individuals who do not consume meat but adhere to a plant-based diet. The questionnaire was applied to a global audience allowing for a broader and more diverse view of the perception of plant-based advertising without being limited to specific geographic locations. The survey was online for a period of 8 days from the 11th to the 19th of November, 2023. The questionnaire was developed in English, to increase the potential for reaching a broader audience. It is available in *Appendix 1*.

3.2 Measurement Scales

Perceptions (health, environmental, and ethical) after exposure to advertising were defined as independent variables in the study, and consumption intention was defined as the dependent variable. Concepts were presented to participants, who were asked to score their perceptions based on advertising using a 7-point Likert scale from 1 = "strongly disagree" to 7 = "strongly agree". In order to develop an accurate survey instrument using appropriate scale measures, references were obtained from the existing literature where the different perceptions had been studied. The first section of the survey was developed to measure perceptions based on the scales previously used

by (Kumar et al., (2023) , (Kim et al., (2013) and (Bi et al., (2023) . Consumption intention was measured based on the scale from (Zhu et al., (2013). The measurement scales were slightly modified in wording to adapt them to the context of the study of plant-based products. The detailed items of the scales used to measure these variables are presented in *Table 1*.

***Table 1**: Scales used to measure the variables.*

Independent Variables	**Items**	**Source**
Environmentally conscious	I. Plant-based products are good for the ecological environment.	(Bi et al., 2023)
	II. Plant-based products can help reduce environmental pollution.	
	III. Plant-based products are conducive to sustainable development.	
	IV. Plant-based products as portrayed in advertising contribute to social development.	
Ethically driven	I. Plant-based products demonstrate a strong commitment to moral values.	(Kumar et al., 2023)
	II. Plant-based products consistently adhere to ethical and legal standards.	
	III. Plant-based products are socially responsible.	
	IV. Plant-based products avoid damaging behaviors at all costs (such as contributing to climate change, cruel practices towards animals, and unfair labor standards).	
	V. Plant-based products are carefully produced, considering the potential positive or negative consequences on society.	
Health-focused	I. Plant-based products provide a nutritionally balanced diet.	(H. J. Kim et al., 2013).
	II. Plant-based products use fresh and natural or organic ingredients.	
	III. Plant-based products use a healthy production method.	
	IV. Plant-based products help control my weight.	
Dependent Variables	**Items**	**Source**

Consumption intention	I.	I plan to buy plant-based food.	(Zhu et al., 2013)
	II.	I plan to buy plant-based food next month	
	III.	I will buy plant-based food to take care of my health	
	IV.	I am willing to pay more for plant-based food because it provides higher life quality	
	V.	I am willing to buy plant-based food to avoid illness	
	VI.	I am willing to buy plant-based food to reduce environmental damage	
	VII.	I am willing to buy plant-based food as a responsible consumer	

3.3 Questionnaire Design

Participants were exposed to a single stimulus involving the viewing of six advertisements. Each type of perception (claims or symbols associated with health, ethical or environmental perceptions) was represented by two different advertisements and each of these advertisements contained a different product from different brands in order to minimize the influence of brand loyalty on participants' responses. This helps to get a fairer, more objective view of how different advertising messages affect perceptions, without preference for a particular brand distorting the results. Each advertisement contained a phrase or message alluding to each perception without directly mentioning the words "health", "environment" or "ethics". The aim was to encourage more natural and authentic responses from participants and to assess how participants interpret and perceive the messages without the presence of certain words directly influencing their responses.

The survey began with an introductory part setting out the study's objective. The first section aimed to outline the profiles of the participants, identify their food consumption choices (meat or non-meat) and also, measure their familiarity and whether they have had previous experience with plant-based products. Subsequently, the survey delved into participants' perceptions of plant-based products, focusing on environmental, ethical, and health considerations, based on exposure to specific advertising images. In addition, participants were asked about their intentions to consume plant-based products. Finally, in the last section, demographic data such as age, gender, income, and education were collected to better understand the profile of the participants.

Illustration 1: Advertisements related to environmental perceptions/claims

Illustration 2: Advertisements related to ethical perceptions/claims:

Illustration 3: Advertisements related to health perceptions/claims:

4 DATA ANALYSIS

This chapter presents all the aspects related to the processing and interpretation of the data collected with the questionnaire presented in the methodology section.

4.1 Descriptive Statistical Analysis

The collected data were subjected to analysis using the SPSS tool. The sample for this study consisted of 314 individuals, of whom 209 completed the questionnaire. After excluding outliers and those who reported problems with image viewing, a pool of 206 surveys were obtained for analysis.

Within these 206 responses, 90 participants identified themselves as meat consumers, representing 44% of all respondents. On the other hand, 116 participants indicated that they do not consume meat, making up the remaining 56% of the sample. These results provide a broad picture of the preferences and behaviors within the study population concerning meat consumption. By achieving a similar number of responses from both types of consumers, the study is better positioned to identify patterns and trends and allows for more meaningful and accurate comparisons. This is because a balance in sample size ensures that the differences observed between groups are more representative of the actual characteristics of each group. It also improves the reliability of conclusions by more clearly highlighting genuine differences in perceptions and consumption intention between the two consumer segments.

4.1.1 Demographics

***Table 2**: Demographics Analysis*

		Are you consumer of meat sources?					
		No		Yes		Total	
		Freq	%	Freq	%	Freq	%
Education	High school	26	22.4%	7	7.8%	33	16.0%
	Bachelors degree	53	45.7%	45	50.0%	98	47.6%
	Masters degree	29	25.0%	33	36.7%	62	30.1%
	PhD	3	2.6%	4	4.4%	7	3.4%
	Prefer not to answer	5	4.3%	1	1.1%	6	2.9%
Age	15 - 25	37	31.9%	26	28.9%	63	30.6%
	26 - 35	57	49.1%	53	58.9%	110	53.4%
	36 - 45	13	11.2%	6	6.7%	19	9.2%
	46 - 55	3	2.6%	3	3.3%	6	2.9%
	56+	4	3.4%	2	2.2%	6	2.9%
	Prefere not to say	2	1.7%	0	0.0%	2	1.0%
Gender	Female	53	45.7%	47	52.2%	100	48.5%
	Male	54	46.6%	43	47.8%	97	47.1%
	Non-binary / third	4	3.4%	0	0.0%	4	1.9%
	Prefer not to say	5	4.3%	0	0.0%	5	2.4%
Income	Under €1000	12	10.3%	8	8.9%	20	9.7%
	€1000-2000	24	20.7%	35	38.9%	59	28.6%
	€2001-3000	17	14.7%	19	21.1%	36	17.5%
	€3001-4000	18	15.5%	10	11.1%	28	13.6%
	€4001-5000	17	14.7%	4	4.4%	21	10.2%
	€5001 and over	28	24.1%	14	15.6%	42	20.4%
Total		**116**	**56%**	**90**	**44%**	**206**	**100%**

As shown in *Table 2* above, the "crosstabs" tool was used to analyze the relationship between two non-metric variables. This analysis allowed us to examine how the dependent variable, in this case meat consumption, varies between different subgroups, considering aspects such as age, income, gender and educational level. This approach gives us the ability to explore in detail how meat consumption preferences may differ or be associated with different demographic characteristics, providing a more complete picture of patterns and trends in the population studied.

For example, when examining the education variable, we observe that the category with the highest representation is "bachelor's degree", with a total of 98 respondents, equivalent to 47.6% of the sample. In relation to meat consumption, it is noteworthy that 50% of those who responded affirmatively about their meat consumption have a university degree, while 45.7% of those who indicated that they do not consume meat also have a bachelor's degree. These findings highlight the significant presence of college-educated individuals in both groups, providing valuable insight into the association between educational level and meat consumption preferences in our sample.

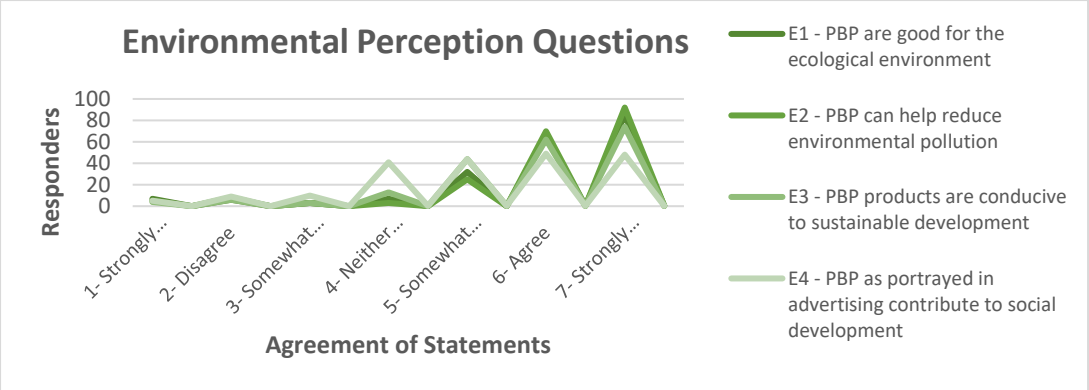
Furthermore, it is notable that the majority of respondents are in the 26 - 35 age range, comprising 53.4% of the sample, followed by the 15 - 25 age group, which accounts for 30.6%. In terms of meat consumption, a difference is observed in the 26 - 35 age group, where 58.9% of respondents who consume meat belong to this age range, while 49.1% of non-meat consumers are also in this age group. These data highlight the relevance of demographics in the dynamics of meat consumption, especially among respondents aged 26-35 years. Whereas in the 15 - 25 age group, the difference in meat consumption or non-consumption is not as wide, ranging from 28.9% to 31.9%, respectively.

In relation to gender, we note that 100 women, equivalent to 48.5%, and 97 men, constituting 47.1%, participated in the survey, achieving a close balance between the two genders. However, when exploring meat consumption preferences in the two groups, we found that among the meat eaters, women had a higher percentage of responses, reaching 52.2%. In contrast, in the group of non-meat eaters, the majority are men, representing 46.6%. This finding highlights the differences in meat consumption preferences between the genders in our sample.

4.1.2 Perceptions

Table 3: *Frequency analysis related to the environmental perception questions.*

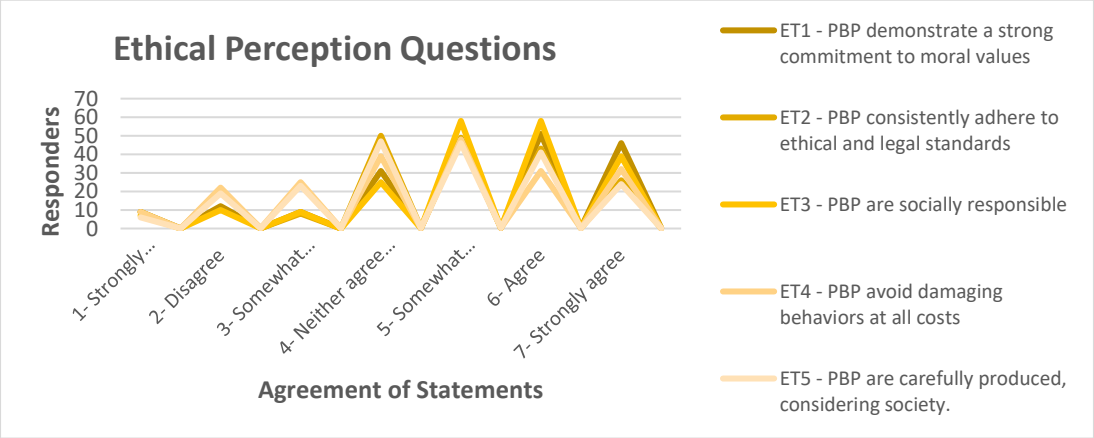
Environmental Perception Questions	1- Strongly disagree		2- Disagree		3- Somewhat disagree		4- Neither agree nor disagree		5- Somewhat agree		6- Agree		7- Strongly agree		Total
E1 - PBP are good for the ecological environment	7	3.4%	6	2.9%	3	1%	7	3.4%	32	16%	66	32.0%	85	41.3%	206
E2 - PBP can help reduce environmental pollution	5	2.4%	8	3.9%	3	1%	3	1.5%	25	12%	70	34.0%	92	44.7%	206
E3 - PBP products are conducive to sustainable development	4	1.9%	6	2.9%	3	1%	13	6.3%	44	21%	62	30.1%	74	35.9%	206
E4 - PBP as portrayed in advertising contribute to social development	5	2.4%	9	4.4%	10	5%	41	19.9%	44	21%	49	23.8%	48	23.3%	206
	21	10.2%	29	14.1%	19	9%	64	31.1%	145	70%	247	119.9%	299	145.1%	824



Breaking down the responses for each type of perception, the first section of the questionnaire focused attention on environmental perceptions, which is composed of 4 statements. This analysis shows that the strongest point is found in the "Strongly Agree" responses for all 4 statements, followed by the "Agree" responses. This pattern reveals a strong tendency towards positive environmental perception, suggesting strong support for the idea that these plant-based foods can be linked to positive environmental awareness. See *Table 3* for responses and their respective graphs.

Table 4: *Frequency analysis related to the ethical perception questions.*

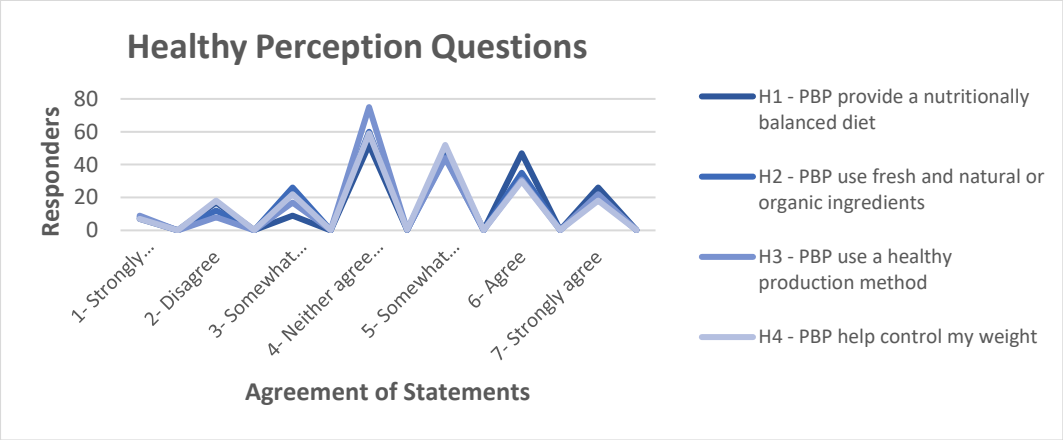
Ethical Perception Questions	1- Strongly disagree		2- Disagree		3- Somewhat disagree		4- Neither agree nor disagree		5- Somewhat agree		6- Agree		7- Strongly agree		Total
ET1 - PBP demonstrate a strong commitment to moral values	9	4.4%	12	5.8%	9	4%	31	15.0%	48	23%	51	24.8%	46	22.3%	206
ET2 - PBP consistently adhere to ethical and legal standards	9	4.4%	21	10.2%	8	4%	50	24.3%	49	24%	43	20.9%	26	12.6%	206
ET3 - PBP are socially responsible	7	3.4%	10	4.9%	9	4%	25	12.1%	58	28%	58	28.2%	39	18.9%	206
ET4 - PBP avoid damaging behaviors at all costs	9	4.4%	22	10.7%	25	12%	39	18.9%	48	23%	31	15.0%	32	15.5%	206
ET5 - PBP are carefully produced, considering society.	6	2.9%	19	9.2%	23	11%	47	22.8%	46	22%	41	19.9%	24	11.7%	206
	31	15.0%	72	35.0%	65	32%	161	78.2%	201	98%	173	84.0%	121	58.7%	824



Further, when breaking down the responses in the ethical perception, it can be seen that for its 4 statements, the responses are predominantly in the range of "Neither Agree nor Disagree" to "Agree". Although this distribution does not show such a pronounced accumulation as in the environmental perception, it does reflect a certain degree of positivism suggesting at least a moderate agreement in terms of ethics relating to plant-based products. See *Table 4* for responses and their respective graphs.

***Table 5**:Frequency analysis related to the healthy perception questions.*

Healthy Perception Questions	1- Strongly disagree		2- Disagree		3- Somewhat disagree		4- Neither agree nor disagree		5- Somewhat agree		6- Agree		7- Strongly agree		Total
H1 - PBP provide a nutritionally balanced diet	7	3.4%	17	8.3%	9	4%	52	25.2%	48	23%	47	22.8%	26	12.6%	206
H2 - PBP use fresh and natural or organic ingredients	8	3.9%	12	5.8%	26	13%	60	29.1%	45	22%	35	17.0%	20	9.7%	206
H3 - PBP use a healthy production method	9	4.4%	8	3.9%	17	8%	75	36.4%	44	21%	31	15.0%	22	10.7%	206
H4 - PBP help control my weight	7	3.4%	18	8.7%	22	11%	59	28.6%	52	25%	30	14.6%	18	8.7%	206
	31	15.0%	55	26.7%	74	36%	246	119.4%	189	92%	143	69.4%	86	41.7%	824



Continuing with the breakdown of perceptions, for the health aspect, a pattern emerges that is totally unlike the environmental and ethical perceptions: the perception of plant-based products as being healthy tends towards neutrality. In this case, the majority of respondents is in the "Neither Agree nor Disagree" category, followed by some responses in the "Somewhat Agree" and "Agree" categories. See *Table 5* for responses and their respective graphs.

4.1.3 Demographics*Perceptions

***Table 6**:Interaction between Perceptions and Gender*

ANOVA Table - Gender			
	Mean	F	Sig.
Environmental_Perception * Gender	**4.997**	**3.481**	**0.017**
Ethical_Perception * Gender	3.919	2.178	0.092
Healthy_Perception * Gender	0.939	0.593	0.620
Consumption Intention Mean * Gender	2.248	1.125	0.340

Looking for the relationship and the role played by the different demographic factors in the perceptions of plant-based products, we observe in *table 6* that only for environmental perception, the gender is statistically significant with a p-value of 0.017. This indicates that there is an

interaction between Environmental Perception and Gender, while for other perceptions there is no statistically significant difference between males and females.

***Table 7**: Interaction between Perceptions and Education level*

ANOVA Table - Education Level			
	Mean	F	Sig.
Environmental_Perception * Education Level	1.961	1.326	0.261
Ethical_Perception * Education Level	2.154	1.181	0.320
Healthy_Perception * Education Level	0.863	0.544	0.704
Consumption Intention Mean * Education Level	**7.857**	**4.167**	**0.003**

Table 7 shows that there is no significance in any of the perceptions in relation to the level of education, but there is significance in the intention to consume, which leads to the suggestion that the level of education may influence people's willingness to consume plant-based products with a p-value of 0.003.

***Table 8:** Interaction between Perceptions and Age*

ANOVA Table - Age			
	Mean	F	Sig.
Environmental_Perception * Age	2.736	1.878	0.100
Ethical_Perception * Age	**5.283**	**3.029**	**0.012**
Healthy_Perception * Age	1.497	0.950	0.450
Consumption Intention Mean * Age	2.852	1.440	0.212

On the other hand, table 8 shows the relationship between the different groups of age and perceptions. Only ethical perception is found to have a significant p-value, which leads us to suggest that there are variations in how different age groups perceive plant-based products ethically with a p-value (0.012).

***Table 9**: Interaction between Perceptions and Age*

ANOVA Table - Income			
	Mean	F	Sig.
Environmental_Perception * Income	2.465	1.685	0.140
Ethical_Perception * Income	**4.495**	**2.549**	**0.029**
Healthy_Perception * Income	2.578	1.665	0.145
Consumption Intention Mean * Income	2.720	1.371	0.237

Finally, the relationship between perceptions and income was sought, and what is observed in Table 9 is that, like Age, the perception of plant-based products as being an ethical alternative can vary according to income level, while income does not show any relationship with the other perceptions.

4.1.4 Type of consumer*Perceptions

***Table 10**: Descriptive analysis related to the type of consumer.*

Are you a consumer of meat from animal source?		N	Mean	Std. Deviation	Std. Error Mean
Environmental_perception	No	116	5.91	1.098	0.102
	Yes	90	5.41	1.314	0.139
Ethical_perception	No	116	5.00	1.315	0.122
	Yes	90	4.57	1.371	0.144
Health_perception	No	116	4.44	1.191	0.111
	Yes	90	4.70	1.324	0.140
Consumption_Intention	No	116	5.1847	1.08976	0.10118
	Yes	90	3.7476	1.37875	0.14533

Examining *Table 10* above reveals the averages for each perception, as well as the average consumption intention, segmented according to the two types of consumers.

Focusing on the first environmental perception, it is interesting to note that both meat eaters and non-meat eaters have relatively similar perceptions of plant-based foods. In particular, on a scale from 1 to 7, meat eaters show an average of 5.41, indicating a moderate environmental evaluation of plant-based foods. On the other hand, non-meat eaters show a slightly higher average of 5.91 on the same scale, suggesting a somewhat more favorable perception of the environmental sustainability of such foods.

The second dimension, focusing on ethics, shows a slight decrease compared to environmental perceptions. Individuals who choose not to consume meat give plant-based products an average rating of 5 regarding their perception of these products as having ethical benefits, in contrast to those who include meat in their diet, who assign a slightly lower value, on average (4.57), to the same perception. This suggests that ethical benefits perceptions of plant-based products are slightly different between meat and non-meat consumers, with a bias towards more positive perceptions among those who choose not to consume meat.

In the last perception examined, related to health, a curious fact is observed, as it is the only perception in which meat eaters show a higher perception of plant-based products than non-meat eaters (although the difference is minor). Meat eaters give a score of 4.7 to the perceived health benefits of plant-based products, while non-meat eaters give a slightly lower score of 4.4.

It is interesting to note that, despite this difference, among all the perceptions, health stands out as the least notable. Its overall rating was lower.

To address the consumption intention of both consumer segments in relation to plant-based products, a marked disparity between them stands out. Non-meat eaters show a higher purchase intention, with a score of 5.1, reflecting a moderately positive attitude towards these products. In contrast, meat consumers exhibit a less favorable purchase intention towards plant-based products, with a score of 3.7 (slightly negative intention), on a scale of 1 to 7.

Table 11: *Interaction between Environmental Perception and type of consumer*

ANOVA Table - Type of consumer			
	Mean	F	Sig.
Environmental_Perception * Type of consumer	**12.556**	**8.759**	**0.003**
Ethical_Perception * Type of consumer	**9.077**	**5.057**	**0.026**
Healthy_Perception * Type of consumer	3.435	2.196	0.140
Consumption Intention Mean * Type of consumer	**104.668**	**69.834**	**0.000**

As described above, slight differences in means between meat eaters and non-meat eaters were observed in environmental perception, ethical perception, and consumption intention. These differences were validated by p-values, which were found to be significant and can be seen in *Table 11*. These results suggest that consumer type significantly influences environmental perceptions, ethical perception, and willingness to consume plant-based products.

4.2 Measures Reliability

Table 12*: Values of the Cronbach's Alphas*

Cronbach's Alpha	
Environmental Perecption	0.867
Ethical Perceptions	0.895
Helathy Perecption	0.857
Consumption Intention	0.927

To assess the reliability of the measures used in our study, the Cronbach's alpha coefficients were calculated for each construct: perceptions and intention to consume. *Table 12* shows the different scores achieved, all of which were above 0.85. These results demonstrate a high internal consistency and reliability of the measures, generating more confidence to the hypotheses testing procedure, and thus providing stable and precise estimates of the variables under study.

4.3 Hypotheses Testing

Model 1 – Linear Regression

A full model regression analysis that considers all input variables was conducted to test the hypotheses, examining the three perceptions as independent variables, consumption intention as the dependent variable, and the type of consumer (meat eater and non-meat eater) as a moderator. *(**Appendix 2** – outputs of SPSS)*

Table 13: *Model Summary - Results of linear Regression (Model 1&2)*

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,458[a]	0.210	0.198	1.2668	
2	,635[b]	0.403	0.382	1.1128	1.558

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	86.275	3	28.758	17.921	<,001[b]
	Residual	324.151	202	1.605		
	Total	410.426	205			
2	Regression	165.256	7	23.608	19.066	<,001[c]
	Residual	245.170	198	1.238		
	Total	410.426	205			

a. Dependent Variable: Consumption Intention Mean

b. Predictors: (Constant), Healthy_Perception, Environmental_Perception, Ethical_Perception

c. Predictors: (Constant), Healthy_Perception, Environmental_Perception, Ethical_Perception, Environemnatl Percepcion _ Meat Consumer , Healthy perception _ Meat consumer, Meat eaters or Non-meat eaters?, Ethical Percepction _ Meat consumer

Initially, a regression analysis was run with only the perceptions and consumption intention without considering the moderating effects of the type of consumer. The results of this analysis (*model 1)* indicate that the model is significantly different from 1 suggesting that at least one of the variables environmental, ethical, or health perceptions has a significant impact on consumption intention. The p-value is < 0.001, indicating that the overall model is statistically significant. A moderate correlation was observed with a value of (R) 0.635, indicating the strength and direction of the relationship between independent variables and the dependent variable. However, on the other hand, the R-squared coefficient is 21%, representing the variability in consumption intention explained by the three perceptions. This index is not genuinely high, which suggests that environmental, health, and ethical perceptions only partially clarify the consumption intention

(there might be other factors that significantly influence the consumption intention and that have not been considered in this study). *(Table 13)*

***Table 14**: Coefficients- Linear Regression*

Coefficients[a]						
Model		Unstandardized Coefficients		Sig.	Collinearity Statistics	
		B	Std. Error		Tolerance	VIF
1	**(Constant)**	**1.611**	**0.445**	**0.000**		
	Environmental_Perception	0.515	0.103	0.000	0.493	2.028
	Ethical_Perception	0.051	0.098	0.604	0.441	2.269
	Healthy_Perception	-0.051	0.086	0.552	0.668	1.497
2	**(Constant)**	**3.310**	**0.598**	**0.000**		
	Environmental_Perception	0.259	0.121	0.034	0.277	3.610
	Ethical_Perception	0.042	0.114	0.713	0.256	3.906
	Healthy_Perception	0.031	0.106	0.773	0.340	2.943
	Non-meat eaters or Meat eaters	-2.650	0.791	0.001	0.039	25.627
	Environemnatl Percepcion _ Meat Consumer	0.267	0.193	0.169	0.020	49.535
	Ethical Percepction _ Meat consumer	-0.146	0.179	0.417	0.031	31.894
	Healthy perception _ Meat consumer	0.122	0.160	0.447	0.038	26.463

a. Dependent Variable: Consumption Intention Mean

Regarding the relationship between the different perceptions and consumption intention, it was found that among Environmental, Ethical, and Healthy perceptions, only environmental perception shows a significant p-value of <0.001 and a positive relationship with consumption intention, as reflected in the B coefficient of 0.515. This means that a 1-unit increase in environmental perception is associated with a 0.515-unit increase in consumption intention. *(Table 14)*

Next, a more comprehensive analysis was conducted by including the type of consumer as a moderator (meat consumers - non-meat consumers) where the full model would be observed. Up to this point, it had been found that environmental perception showed a positive and significant relationship with consumption intention. However, the question remained whether the inclusion of the moderator would maintain this relationship and if environmental perception would remain the main predictor of a positive disposition towards consumption, or whether other perceptions would also show positive and significant effects.

Furthermore, it was investigated whether the involvement of the moderator in the relationships between the different perceptions and consumption intention generated a significant influence, especially for non-meat consumers.

To summarize, the first three hypotheses aimed to assess the effect of the independent variables (the perceptions of plant-based foods as being Environmental Conscious, Ethically Driven and Health Focused) on the dependent variable (Consumption Intention), specifying that these three variables led to a positive effect on the dependent variable. We concluded that H1, related to environmental perceptions, was supported by the statistical significance and the positive direction of the coefficient. However, H2 and H3, related to ethical and healthy perceptions, respectively, were not supported as the p-values are not significant.

H1: Environmental benefits perception of plant-based products (derived from exposure to advertising) lead to a positive consumption intention of those products ***(Validated)***

H2: Ethical benefits perception of plant-based products (derived from exposure to advertising) lead to a positive consumption intention of those products ***(Not validated)***

H3: Health benefits perception of plant-based products (derived from exposure to advertising) lead to a positive consumption intention. ***(Not validated)***

Subsequently, for hypotheses 4, 5 and 6, we aimed to assess if there was a moderating effect of the type of consumer on the interactions between the independent and moderator variables. We also wanted to assess if H2 and H3 would be validated by adding the type of consumer as moderator.

To address this, a new linear regression including the moderator was carried out to build the full model *(Model 2)*. In addition, interactions between the moderator and each of the independent variables were added to analyze the joint effect of each perception together with consumer type on consumption intention.

The proposed model was found to be also statistically significant, indicated by a p-value < 0.001, again suggesting that at least one of the three perceptions has an impact on consumption intention. When adding the moderator and looking at the summary of Model 2, it was noted that the coefficient (R-squared) increased to 40% compared to "only" 21% in the previous model, suggesting that it more effectively explains the variability in consumption intention when including additional variables. On the other hand, in this model, the Standard Error decreased from 1.266 to 1.112 compared to the other model, indicating a better fit to the data. *(Table 13)*.

To validate the hypotheses, *Table 14* of coefficients was analyzed. In Model 2, it is observed that, like with model 1, among environmental, ethical, and health perceptions, only environmental

perception shows a significant p-value (<0.034) and a positive relationship with consumption intention, as reflected by the coefficient of 0.259. This means a 1-unit increase in environmental perception is associated with a 0.259-unit increase in consumption intention. However, it is important to note that the values associated with consumption intention have decreased (The B coefficient was 0.515 in Model 1). This decrease suggests that, by incorporating the type of consumer into the model, the consumption intention driven by environmental perceptions of plant-based products may be lower compared to the scenario where no moderator is present. This could indicate that the presence of the moderator variable modifies the influence of environmental perception on purchase intention.

On the other hand, although more variables were added to the model which made the model more relevant, and the variables explained more of the model, ethical and health perceptions did not show significance, because all p-values are below 0.05, meaning that having a positive perception of the ethical or health benefits of plant-based products does not become relevant for the product's consumption intention.

Regarding the validation of the hypotheses in Model 2 (the full model with the moderator variable), H1 related to environmental perceptions was supported by the statistical significance and the positive direction of the coefficient. However, H2 and H3, related to ethical and health perceptions, respectively, were not supported as the p-values are not significant, meaning that the latter 2 perceptions are not (statically) significantly related with the intention to consume plant-based products.

H1: Environmental benefits perception of plant-based products (derived from exposure to advertising) lead to a positive consumption intention of those products ***(Validated)***

H2: Perceptions of plant-based products as being ethically beneficial (after exposure to advertising) lead to a positive consumption intention of those products. ***(Not validated)***

H3: Perceptions of plant-based products as being healthy (after exposure to advertising) lead to a positive consumption intention of those products. ***(Not validated)***

Regarding the study's evaluation of the other hypotheses, the moderator is coded as a dummy variable, where 0 represents the non-meat consumer and 1 represents the meat consumer. From this, it can be seen in *Table 14* that the moderator, namely the type of consumer is significant, with

a p-value of (< 0.001), indicating that there is a significant difference in the consumption intention of plant-based products between non-meat eaters and meat eaters. The coefficient that generates this relationship is -2.650 with meat eaters, this negative value indicates that meat eaters tend to have a lower purchase intention than non-meat eaters.

After knowing the moderating effect is significant, the interactions between each perception and the moderator were determined in order to identify whether the perceptions affect the intention to consume plant-based products for these 2 particular groups. The interactions created were the following: Environmental Perception _ Meat Consumer, Ethical Perception _ Meat Consumer, Health Perception _ Meat Consumer).

The analysis revealed that none of the interactions between perceptions with the moderator were significant (all values have a p-value above 0.05) which leads us to conclude that the relationship between environmental, ethical, and health perceptions and consumption intention is independent of whether someone consumes meat or not, invalidating hypotheses 4, 5 and 6.

Although the full linear regression model produced valuable insights such as the relationship between the variables, multicollinearity was detected, as there are tolerance values (<0.4) and VIF values (>2.5) meaning that some variables may be highly correlated, and some variables were included that may not be necessary to explain consumption intention such as ethical and health perception, which were shown to be non-explanatory variables for consumption intention. To improve the accuracy of the model and to select the most relevant and explanatory variables, it was decided to apply the Stepwise method for the selection of the variables, as this method allows the automatic selection of influential variables by eliminating those that do not have a significant contribution.

Table 15: *Coefficients- Linear Regression (Stepwise)*

Coefficients[a]

Model		Unstandardized Coefficients		Sig.	Collinearity Statistics	
		B	Std. Error		Tolerance	VIF
1	(Constant)	2.653	0.399	**0.000**		
	Non-meat eaters or Meat eaters	-1.224	0.160	0.000	0.959	1.043
	Environmental_Perception	0.428	0.065	0.000	0.959	1.043

a. Dependent Variable: Consumption Intention Mean

The new model effectively eliminated the multicollinearity it previously had. It also excluded the ethical and health perceptions, thereby eliminating the interactions between the perceptions and the moderator. This further supports the conclusion that consumer type has no relevance among the relationships between the three perceptions and consumption intention. Additionally, this new model confirms the earlier findings, indicating that consumer type, specifically meat consumers, has a negative effect on consumption intention. Furthermore, it highlights that environmental perceptions positively influence consumption intention.

H4: Consumer type moderates environmental perceptions' impact on plant-based consumption intention so that it is stronger for non-meat eaters. ***(Not validated).***

H5: Consumer type moderates ethical perceptions' impact on plant-based consumption intention so that it is stronger for non-meat eaters. ***(Not validated).***

H6: Consumer type moderates health perceptions' impact on plant-based consumption intention so that it is stronger for non-meat eaters. ***(Not validated).***

5 DISCUSSION

The findings obtained in our study were compared with results obtained in previous studies to enrich the research conclusions. Differences and similarities in results were sought to identify significant contributions.

One of the key findings of our study is the positive and significant relationship found between environmental perceptions (derived from advertising) and the intention to consume plant-based products, which is consistent with findings found in previous literature, namely Corrin & Papadopoulos (2017) and Mandliya et al. (2020). Indeed, previous research, as Mandliya et al., (2020) had already observed that positive environmental perceptions about products positively influence the propensity to buy those products that support environment preservation.

Moreover, comparing our study with the previous research entitled "Can Green Advertising Increase Consumers' purchase intention of Electric Vehicles? An Experimental Study from China", interesting similarities can be observed. Both studies show that having a higher environmental perception is associated with an increase in purchase or consumption intention. Although the products studied are different, this trend reflects the growing importance of the environmental factor in consumer decisions. Bi et al. (2023) also suggest that the positive influence of the environmental aspect on consumers intention to adopt environmentally friendly products persists in diverse contexts. Also, when considering the study "Green food consumption intention, behaviors and influencing factors among Chinese Consumers "Zhu et al., (2013), a relevant similarity is established with the present study on plant-based products. Consistent with our findings, the results of that study highlight the importance of environmental value in driving green food consumption intention. These similarities in the conclusions of both studies reinforce once again, the idea that the value attributed to the environmental aspect plays a key role in the consumption decision.

On the other hand, there is a disparity in the findings of our study regarding the relationship with perceived ethics and the findings of the previous study "Role of customer perceived brand ethicality in inducing engagement in online brand communities" Kumar et al., (2023).While that study suggests that perceived brand ethics can have a favorable impact on consumer responses, in our study, ethical perception did not show a clear significance on the willingness to consume plant-

based products. As the descriptive statistics figures for ethical perceptions in *(Table 4)* show, it does reflect a moderate agreement, with not very high values in terms of ethics relating to plant-based products (after exposure to advertising). This may be because these advertisements relating to ethical perceptions of plant-based foods were not as "obvious" and noticeable as the environmental claims in the advertisements shown, which were clearer. Perhaps if the advertisements were shown in more detail about the ethical "benefits" or were intended to "inspire" ethical perceptions of plant-based products but not in such an abstract way, the results on ethical perceptions of plant-based products would have been "stronger", which could have led to different results, possibly generating a significant positive relationship between ethical perceptions of plant-based products and intention to consume them. It is also noteworthy that both studies included a moderator variable; in this case, Kumar et al., (2023), the moderator was "skepticism", and, as in the plant-based products study, the moderating effects were not relevant. In our study, no significant differences were found between the type of consumers (the moderator in our study) concerning ethical perceptions.

Regarding perceived healthiness, it is possible to establish a comparison with the previous study "Does perceived restaurant food healthiness matter? Its influence on value, satisfaction, and revisit intentions in restaurant operations in South Kora, "Kim et al., (2013). In that restaurant context study, perceived food healthiness showed a significant positive impact on perceived value. However, in our study, focusing on plant-based products, perceived healthiness of plant-based foods did not show to have an influence on consumption intention. Furthermore, given the type of advertising shown, the health claims were more related to the “fat” of the meat product and the nutritional content of the product, than to other more relevant health claims such as being "less carcinogenic" or not having hormones and other artificial additives, or being shown as a more "natural" product, which could have led to different results, which is considered one of the reasons why health perceptions are not as strong and have not been shown to have a positive relationship with the intention to consume plant-based products.

6 CONCLUSION

In this last chapter, a brief summary of the key findings observed in the previous chapters will be made. In doing so, we seek to address the three research questions that were posed at the outset of the study. In addition, the limitations of our research will be presented, as well as the potential contributions generated by the study. Finally, suggestions for future research will be offered.

6.1 Key findings and Research Questions

One of the most relevant findings of our study was the positive and significant relationship between environmental perception and consumption intention, after exposure to a sample advertisement of plant-based products. It was also found that there was no moderating effect of the hypothesized moderator variable (the consumer type), meaning that the relationships between the three different perceptions and consumption intention of plant-based products do not vary significantly between meat and non-meat consumers. In addition, the two types of consumers, meat eaters and non-meat eaters, as an independent variable shows differences in their consumption intentions, indicating that non-meat eaters have a higher consumption intention of plant-based products.

Below, we address the 3 research questions that were raised initially in the study and provide a more detailed understanding of the results.

*RQ1: How do non-meat consumers and meat consumers differ in their **perceptions** of plant-based food based on exposure to advertising?*

It was found that meat eaters and non-meat eaters differed in their environmental and ethical perceptions of plant-based products, while in terms of health perception, there were no significant differences. Concerning the environmental and ethical perceptions, these perceptions were positive for both groups but more positive for non-meat eaters. Therefore, advertising plant-based products that address environmental and ethical issues may be effective, especially for non-meat eaters. (Table 11).

*RQ2: What roles do demographic factors such as age, gender, and income play in consumer **perceptions** of plant-based food after an advertising exposure in both groups?*

As shown by the statistical analyses, demographic factors play an important role in consumer perceptions of plant-based food advertising and there are significant differences according to demographics. However, not all demographic factors (age, gender, educational level, and income) were significant for all perceptions (Environmental, ethical and health).

In the case of the environmental perceptions of plant-based products, a significant gender difference was observed. This implies that men have a significantly different environmental perception compared to women. (Table 6). Showing that women have a more favorable environmental perception of plant-based products than men after being exposed to them by advertising (Appendix 3).

As for the ethical perception of plant-based products, a significant difference was observed as a function of age (Table 8) and income (Table 9). This indicates that the perception of plant-based products as being ethical varies between different age groups and also between different income levels. This difference can manifest itself between two or more age groups and also between income groups. In terms of age, the group with the highest ethical perception of plant-based products is the 15-25 age group, which is the youngest age group of all, while in terms of income, the group with the highest ethical perception of plant-based products after an advertising sample are those with the lowest income, that is the group under 1000eur (Appendix 3).

Regarding the perception of plant-based products as being health-beneficial, demographic factors were not relevant, suggesting that for age, gender, income and educational level, the perception of the health benefits of plant-based products does not show significant differences.

In addition, educational level was not a significant factor in any of the perceptions. (Table 7)

*RQ3: Are there specific **messaging strategies or themes** in plant-based food advertising that resonate differently with non-meat consumers and meat consumers to have higher consumption intention?*

Among the three perceptions studied (environmental, ethical and health), the environmental messages stood out as the most influential in generating a higher intention to consume plant-based products. This may be because among the advertisements shown, the environmental perceptions were the most obvious and prominent, while the other images of the ethical and healthy perceptions were not so literal and could have different interpretations. The difficulty in finding suitable representations for each perception during the image search, combined with the added complexity of being tied to a single language in the questionnaire, is the reason for these challenges.

However, when exploring the impact of the message on consumption intention, considering the type of consumer as a moderator, it was found that the relationship between these variables was independent of the type of consumer. In other words, there is no significant difference between the advertising message and consumption intention as a function of consumer type.

This finding leads us to conclude that, at least with the perceptions studied, it is not possible to identify a specific messaging strategy that differentiates consumption intention between meat and non-meat consumers.

6.2 Contributions, Limitations and Future Research

One of the most distinctive contributions of this study for scientific knowledge lies in the variables examined. For the first time, environmental, ethical and health perceptions were addressed together in the context of plant-based products. This study distinguishes itself by not limiting to simply evaluating adoption intention of the products but also delves into the evaluation of the perceptions of the product after exposure to advertising. This contribution is very relevant for the market since, by knowing the most influential perceptions at the time of a purchase intention, the different companies that are expecting to promote their plant-based products could opt to show their benefits in a more environmental way than ethically or healthily, since this perception is the one that influences the purchase intention.

In addition, the study proposed an innovative model where are shown the interrelationships between three perceptions of plant-based products after exposure to advertising and their influence on consumption intention, all moderated by the type of consumer, omnivore or not. This allows marketing strategies to be targeted according to the type of consumer, thus improving perceptions specifically for each group, knowing for each group which perception is more relevant and which

is not for this type of product. It is recognized that environmental and ethical perceptions differ between meat eaters and consumers of plant-based products. In both cases, vegetarians show a more favorable ethical and environmental perception towards plant-based products. Regarding healthy perception, a joint strategy can be developed for both types of consumers, as no significant differences are found in the way they perceive the health benefits of plant-based products in advertising.

On the other hand, in terms of practical contributions, we highlight the fact that the environmental benefits associated with plant-based food consumptions is particularly influential and can guide more effective advertising strategies. This provides specific information to the plant-based products industry on the issues that might resonate most with consumers and, therefore, drive consumer intent.

As well as highlighting the main contributions, we acknowledge some limitations of our study.

One limitation identified in this study is related to the images of advertisements used in the questionnaire, which could introduce biases in the participants' responses. In the images related to the ethical perception, their messages and wording were not as obvious as those of the other perceptions; their messages were more abstract, which may have had an influence in the participants' interpretation and, ultimately, their responses. Also, in the images related to health perception were more related to the “fat” of the meat product and the nutritional content of the product, than to other more relevant health claims such as being "less carcinogenic" or not having hormones and other artificial additives, or being shown as a more "natural". This also slightly deviates the initial interpretation that the image conveyed and does not allow it to be fully perceived as a healthy product.

Additionally, it was observed that in the environmental perception, the two advertising images showed the same product (hamburgers) and in the other perceptions, the products were of different categories. This difference could introduce a possible bias based on the product preferences shown in the advertising.

The most significant limitation of this study lies in the evaluation of the impact of the perceptual variables (environmental, ethical and health) on the variable of interest, consumption intention. Although key perceptions about plant-based products were explored, there are other variables that

were not addressed in this study that may influence consumption intention, for example, price, lifestyle, variety of products, religion, and others. By introducing other variables in the model, the R-squared coefficient could increase, indicating a higher explanation power of the model to explain the variability in consumption intention. Additionally, the identification of a more relevant moderator could further enrich the study could be age or gender. This emphasizes the need for future research that addresses these limitations, namely by including other possible influential variables relevant to the relationship and dynamics between perceptions of plant-based products and their consumption intention. This may help to strengthen the validity of the results in the broader context of the herbal products market.

Also, as a suggestion, it would be interesting to see how people would behave when analyzing the variables in another type of advertisement, such as a video for example, where the focus of the variables is more pronounced, recognized, and obvious.

Other suggestions that would be useful to the study would be to conduct a qualitative study based on personal interviews and focus groups to go deeper into consumer trends, to find more variables that may be more relevant in this type of product.

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Appendix 1

Questionnaire

Start of Block: Default Question Block

Introduction Dear participant,

Thank you for being part of my research study.

I am Susana Ortiz, a master's student at the Catholic University of Lisbon. The primary objective of this study is to delve into the consumer perception regarding a specific product category in the context of advertising.

Your participation in this questionnaire is important in order to obtain valuable information for my research. Completing the questionnaire will take approximately 5 minutes of your time. It is important to note that all responses will be treated anonymously and confidentially.

If you have any doubts or questions, please do not hesitate to contact me at s-socorrea@ucp.pt

Thank you for your time!

End of Block: Default Question Block

Start of Block: Type of consumer

Q1 Are you a consumer of meat from animal sources?

- No (1)
- Yes (2)

Q2 Have you tried plant-based products?

“Plant-based products" mean food items derived from plants without any animal ingredients, offering alternatives to traditional animal-based products. Examples include plant-based milk, meat substitutes, tofu, and other items made exclusively from plant sources.

- No (1)
- Maybe (2)
- Yes (3)

End of Block: Type of consumer

Start of Block: Environmental Questions

Q3 Based exclusively on the ad you have just seen; indicate to which extent you agree or disagree with the following statements…

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Plant-based products are good for the ecological environment (1)	○	○	○	○	○	○	○
Plant-based products can help reduce environmental pollution (2)	○	○	○	○	○	○	○
Plant-based products are conducive to sustainable development (3)	○	○	○	○	○	○	○
Plant-based products as portrayed in advertising contribute to social development. (4)	○	○	○	○	○	○	○

End of Block: Environmental Questions

Start of Block: Ethical questions

Q4 Based exclusively on the ad you have just seen; indicate to which extent you agree or disagree with the following statements…

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Plant-based products demonstrate a strong commitment to moral values (1)	○	○	○	○	○	○	○
Plant-based products consistently adhere to ethical and legal standards (2)	○	○	○	○	○	○	○
Plant-based products are socially responsible (3)	○	○	○	○	○	○	○
Plant-based products avoid damaging behaviors at all costs (such as contributing to climate change, cruel practices towards animals, and unfair labor standards). (4)	○	○	○	○	○	○	○
Plant-based products are carefully produced,	○	○	○	○	○	○	○

considering the potential positive or negative

End of Block: Ethical questions

Start of Block: Health Questions

Q5 Based exclusively on the ad you have just seen; indicate to which extent you agree or disagree with the following statements…

End of Block: Health Questions

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Plant-based products provide a nutritionally balanced diet (1)	○	○	○	○	○	○	○
Plant-based products use fresh and natural or organic ingredients (2)	○	○	○	○	○	○	○
Plant-based products use a healthy production method (5)	○	○	○	○	○	○	○
Plant-based products help control my weight (6)	○	○	○	○	○	○	○

Start of Block: Consumption Intention

Q7 Indicate to which extent you agree or disagree with the following statements...

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly Agree (7)
I plan to buy plant-based food (1)	○	○	○	○	○	○	○
I plan to buy plant-based food next month (2)	○	○	○	○	○	○	○
I will buy plant-based food to take care of my health (3)	○	○	○	○	○	○	○
I am willing to pay more for plant-based food because it provides higher life quality (4)	○	○	○	○	○	○	○
I am willing to buy plant-based food to avoid illness (5)	○	○	○	○	○	○	○
I am willing to buy plant-based food to reduce environmental damage (6)	○	○	○	○	○	○	○
I am willing to buy plant-based food as a responsible consumer (7)	○	○	○	○	○	○	○

End of Block: Consumption Intention

Start of Block: Block 6

- ○ Q8 Which gender Female (1)
- ○ Male (2)
- ○ Non-binary / third gender (3)
- ○ Prefer not to say (4)

Q9 Please indicate your age.

- ○ 15 - 25 (1)
- ○ 26 - 35 (2)
- ○ 36 - 45 (3)
- ○ 46 - 55 (4)
- ○ 56+ (5)
- ○ Prefere not to say (6)

Q10 Please indicate your highest educational level.

- ○ High school (1)
- ○ Bachelors degree (2)
- ○ Masters degree (3)
- ○ PhD (4)
- ○ Prefer not to answer (5)
- ○ None of the above (6)

Q11 Which of the following groups comes closest to your monthly household income?

- Under €1000 (1)
- €1000-2000 (2)
- €2001-3000 (3)
- €3001-4000 (4)
- €4001-5000 (5)
- €5001 and over (6)

Q12 Were all the visuals displayed correctly?

- Yes (1)
- No (2)

End of Block: Block 6

Appendix 2

SPSS Results

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
Consumption Intention Mean	4,557	1,4149	206
Environmental_Perceptio n	5,6942	1,21972	206
Ethical_Perception	4,8117	1,35296	206
Healthy_Perception	4,5534	1,25433	206
Meat eaters or Non-meat eaters?	,44	,497	206
Environemnatl Percepcion _ Meat Consumer	2,3653	2,82774	206
Ethical Percepction _ Meat consumer	1,9981	2,44670	206
Healthy perception _ Meat consumer	2,0534	2,49430	206

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Healthy_Perc eption, Environmenta l_Perception, Ethical_Perce ption[b]	.	Enter
2	Environemnat l Percepcion _ Meat Consumer , Healthy perception _ Meat consumer, Meat eaters or Non-meat eaters?, Ethical Percepction _ Meat consumer[b]	.	Enter

a. Dependent Variable: Consumption Intention Mean

b. All requested variables entered.

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,458[a]	,210	,198	1,2668	
2	,635[b]	,403	,382	1,1128	1,558

a. Predictors: (Constant), Healthy_Perception, Environmental_Perception, Ethical_Perception

b. Predictors: (Constant), Healthy_Perception, Environmental_Perception, Ethical_Perception, Environemnatl Percepcion _ Meat Consumer , Healthy perception _ Meat consumer, Meat eaters or Non-meat eaters?, Ethical Percepction _ Meat consumer

c. Dependent Variable: Consumption Intention Mean

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	86,275	3	28,758	17,921	<,001[b]
	Residual	324,151	202	1,605		
	Total	410,426	205			
2	Regression	165,256	7	23,608	19,066	<,001[c]
	Residual	245,170	198	1,238		
	Total	410,426	205			

a. Dependent Variable: Consumption Intention Mean

b. Predictors: (Constant), Healthy_Perception, Environmental_Perception, Ethical_Perception

c. Predictors: (Constant), Healthy_Perception, Environmental_Perception, Ethical_Perception, Environemnatl Percepcion _ Meat Consumer , Healthy perception _ Meat consumer, Meat eaters or Non-meat eaters?, Ethical Percepction _ Meat consumer

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1,611	,445		3,622	<,001		
	Environmental_Perception	,515	,103	,444	4,989	<,001	,493	2,028
	Ethical_Perception	,051	,098	,049	,519	,604	,441	2,269
	Healthy_Perception	-,051	,086	-,046	-,596	,552	,668	1,497
2	(Constant)	3,310	,598		5,535	<,001		
	Environmental_Perception	,259	,121	,223	2,137	,034	,277	3,610
	Ethical_Perception	,042	,114	,040	,369	,713	,256	3,906
	Healthy_Perception	,031	,106	,027	,289	,773	,340	2,943
	Meat eaters or Non-meat eaters?	-2,650	,791	-,931	-3,349	<,001	,039	25,627
	Environemnatl Percepcion _ Meat Consumer	,267	,193	,533	1,379	,169	,020	49,535
	Ethical Percepction _ Meat consumer	-,146	,179	-,252	-,813	,417	,031	31,894
	Healthy perception _ Meat consumer	,122	,160	,215	,761	,447	,038	26,463

a. Dependent Variable: Consumption Intention Mean

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Meat eaters or Non-meat eaters?	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	Environmental_Perception	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: Consumption Intention Mean

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,505[a]	,255	,251	1,2243	
2	,621[b]	,386	,380	1,1144	1,586

a. Predictors: (Constant), Meat eaters or Non-meat eaters?

b. Predictors: (Constant), Meat eaters or Non-meat eaters?, Environmental_Perception

c. Dependent Variable: Consumption Intention Mean

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	104,668	1	104,668	69,834	<,001[b]
	Residual	305,758	204	1,499		
	Total	410,426	205			
2	Regression	158,322	2	79,161	63,742	<,001[c]
	Residual	252,104	203	1,242		
	Total	410,426	205			

a. Dependent Variable: Consumption Intention Mean

b. Predictors: (Constant), Meat eaters or Non-meat eaters?

c. Predictors: (Constant), Meat eaters or Non-meat eaters?, Environmental_Perception

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	5,185	,114		45,612	<,001		
	Meat eaters or Non-meat eaters?	-1,437	,172	-,505	-8,357	<,001	1,000	1,000
2	(Constant)	2,653	,399		6,650	<,001		
	Meat eaters or Non-meat eaters?	-1,224	,160	-,430	-7,656	<,001	,959	1,043
	Environmental_Perception	,428	,065	,369	6,573	<,001	,959	1,043

a. Dependent Variable: Consumption Intention Mean

Appendix 3

Perception*Demographics

Oneway

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Environmental_Perception	Female	100	5,7925	1,12088	,11209	5,5701	6,0149	1,75	7,00
	Male	97	5,6211	1,19030	,12086	5,3812	5,8610	1,00	7,00
	Non-binary / third gender	4	4,0625	3,00260	1,50130	-,7153	8,8403	1,00	7,00
	Prefer not to say	5	6,4500	,79844	,35707	5,4586	7,4414	5,25	7,00
	Total	206	5,6942	1,21972	,08498	5,5266	5,8617	1,00	7,00
Ethical_Perception	Female	100	4,9720	1,28110	,12811	4,7178	5,2262	1,40	7,00
	Male	97	4,6330	1,39334	,14147	4,3522	4,9138	1,00	7,00
	Non-binary / third gender	4	4,0500	1,74642	,87321	1,2710	6,8290	1,60	5,40
	Prefer not to say	5	5,6800	1,17132	,52383	4,2256	7,1344	4,40	7,00
	Total	206	4,8117	1,35296	,09427	4,6258	4,9975	1,00	7,00
Healthy_Perception	Female	100	4,6175	1,22755	,12276	4,3739	4,8611	1,00	7,00
	Male	97	4,4897	1,28691	,13067	4,2303	4,7491	1,00	7,00
	Non-binary / third gender	4	4,0000	1,42887	,71443	1,7264	6,2736	2,00	5,25
	Prefer not to say	5	4,9500	1,16458	,52082	3,5040	6,3960	4,25	7,00
	Total	206	4,5534	1,25433	,08739	4,3811	4,7257	1,00	7,00

Oneway

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Environmental_Perception	15 - 25	63	5,8690	1,17592	,14815	5,5729	6,1652	1,00	7,00
	26 - 35	110	5,6636	1,20703	,11509	5,4355	5,8917	1,75	7,00
	36 - 45	19	5,4868	1,34751	,30914	4,8374	6,1363	1,00	7,00
	46 - 55	6	5,7500	,70711	,28868	5,0079	6,4921	4,50	6,50
	56+	6	4,5833	1,52206	,62138	2,9860	6,1806	2,00	6,00
	Prefere not to say	2	7,0000	,00000	,00000	7,0000	7,0000	7,00	7,00
	Total	206	5,6942	1,21972	,08498	5,5266	5,8617	1,00	7,00
Ethical_Perception	15 - 25	63	5,0730	1,20499	,15181	4,7695	5,3765	1,00	7,00
	26 - 35	110	4,8364	1,30579	,12450	4,5896	5,0831	1,40	7,00
	36 - 45	19	4,0842	1,70921	,39212	3,2604	4,9080	1,00	7,00
	46 - 55	6	4,9333	1,03280	,42164	3,8495	6,0172	3,40	6,20
	56+	6	3,5000	1,52709	,62343	1,8974	5,1026	1,60	5,80
	Prefere not to say	2	5,7000	1,83848	1,30000	-10,8181	22,2181	4,40	7,00
	Total	206	4,8117	1,35296	,09427	4,6258	4,9975	1,00	7,00
Healthy_Perception	15 - 25	63	4,5675	1,15022	,14491	4,2778	4,8571	1,00	7,00
	26 - 35	110	4,5955	1,29039	,12303	4,3516	4,8393	1,00	7,00
	36 - 45	19	4,2237	1,14532	,26276	3,6717	4,7757	1,75	6,25
	46 - 55	6	4,9167	1,31972	,53877	3,5317	6,3016	3,00	6,75
	56+	6	3,9583	1,75654	,71710	2,1150	5,8017	2,00	6,25
	Prefere not to say	2	5,6250	1,94454	1,37500	-11,8460	23,0960	4,25	7,00
	Total	206	4,5534	1,25433	,08739	4,3811	4,7257	1,00	7,00

Oneway

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Environmental_Perception	Under €1000	20	6,0625	,73840	,16511	5,7169	6,4081	4,75	7,00
	€1000-2000	59	5,7542	1,33220	,17344	5,4071	6,1014	1,00	7,00
	€2001-3000	36	5,6111	1,27957	,21326	5,1782	6,0441	1,75	7,00
	€3001-4000	28	5,8482	,70165	,13260	5,5761	6,1203	4,25	7,00
	€4001-5000	21	5,9405	,68422	,14931	5,6290	6,2519	4,75	7,00
	€5001 and over	42	5,2798	1,55705	,24026	4,7946	5,7650	1,00	7,00
	Total	206	5,6942	1,21972	,08498	5,5266	5,8617	1,00	7,00
Ethical_Perception	Under €1000	20	5,3500	,89413	,19993	4,9315	5,7685	3,80	7,00
	€1000-2000	59	5,1559	1,29512	,16861	4,8184	5,4934	1,80	7,00
	€2001-3000	36	4,4944	1,37860	,22977	4,0280	4,9609	1,40	7,00
	€3001-4000	28	4,8071	1,12148	,21194	4,3723	5,2420	2,00	7,00
	€4001-5000	21	4,4857	1,61688	,35283	3,7497	5,2217	1,00	7,00
	€5001 and over	42	4,5095	1,46117	,22546	4,0542	4,9649	1,00	7,00
	Total	206	4,8117	1,35296	,09427	4,6258	4,9975	1,00	7,00
Healthy_Perception	Under €1000	20	4,6875	1,34721	,30124	4,0570	5,3180	1,50	7,00
	€1000-2000	59	4,7712	1,31985	,17183	4,4272	5,1151	1,00	7,00
	€2001-3000	36	4,2153	1,09406	,18234	3,8451	4,5855	2,00	6,50
	€3001-4000	28	4,8839	1,03968	,19648	4,4808	5,2871	2,00	7,00
	€4001-5000	21	4,3214	1,19933	,26172	3,7755	4,8674	2,25	6,25
	€5001 and over	42	4,3690	1,34599	,20769	3,9496	4,7885	1,00	7,00
	Total	206	4,5534	1,25433	,08739	4,3811	4,7257	1,00	7,00

➔ **Oneway**

Descriptives

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Environmental_Perception	High school	33	5,9015	1,15910	,20177	5,4905	6,3125	1,00	7,00
	Bachelors degree	98	5,7526	1,21656	,12289	5,5086	5,9965	1,00	7,00
	Masters degree	62	5,4435	1,29502	,16447	5,1147	5,7724	1,00	7,00
	PhD	7	5,6071	,60994	,23053	5,0430	6,1712	4,50	6,25
	Prefer not to answer	6	6,2917	1,10019	,44915	5,1371	7,4462	4,75	7,00
	Total	206	5,6942	1,21972	,08498	5,5266	5,8617	1,00	7,00
Ethical_Perception	High school	33	5,0848	1,39466	,24278	4,5903	5,5794	2,00	7,00
	Bachelors degree	98	4,8510	1,33140	,13449	4,5841	5,1179	1,00	7,00
	Masters degree	62	4,5677	1,39563	,17725	4,2133	4,9222	1,00	7,00
	PhD	7	4,6286	,73420	,27750	3,9496	5,3076	4,00	5,80
	Prefer not to answer	6	5,4000	1,44222	,58878	3,8865	6,9135	3,60	7,00
	Total	206	4,8117	1,35296	,09427	4,6258	4,9975	1,00	7,00
Healthy_Perception	High school	33	4,5606	1,22639	,21349	4,1257	4,9955	2,00	7,00
	Bachelors degree	98	4,4464	1,25655	,12693	4,1945	4,6984	1,00	7,00
	Masters degree	62	4,6452	1,29513	,16448	4,3163	4,9741	1,00	7,00
	PhD	7	4,7857	1,19398	,45128	3,6815	5,8900	3,25	6,75
	Prefer not to answer	6	5,0417	1,17704	,48052	3,8064	6,2769	3,75	7,00
	Total	206	4,5534	1,25433	,08739	4,3811	4,7257	1,00	7,00