



“Faculty of Social Sciences”  
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Postgraduate Dissertation  
“Assessing the Impact of Sustainability Labels on Consumer Food  
Purchasing Decisions: Evidence from the Greek Market.”

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Patras, Greece, May 2026

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# “Assessing the Impact of Sustainability Labels on Consumer Food Purchasing Decisions: Evidence from the Greek Market.”

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*“To my beloved family”*

## **Abstract**

Over the last decade, sustainability has become an important point worldwide in food production. Many studies indicate that industrial food production has a significant impact on the environment. As part of their sustainability strategies, companies are trying to communicate their environmental responsibility and prove that their products are produced sustainably; hence, various product labels are used, such as “carbon neutral” or “GMO-free”. However, the real influence of these labels in the Greek market is uncertain. Especially in an environment where the high inflation rates are keeping customers' price sensitivity high.

The scope of this study is to investigate the level of awareness, understanding and trust of the Greek customers when it comes to sustainability labels. The study has also investigated if the Greek consumers are willing to pay more for a product with a sustainable label on it and how much this willingness to pay is affected from the understanding and the trust of the labels. The study apply quantitative research through an online questionnaire, analyzing responses across demographic groups to identify patterns and correlations between consumer attitudes, environmental awareness, and purchasing intentions.

This topic is contributing both in the academic environment and in the practical business environment. The results offer an insight to food manufacturers, retailers and policymakers. By understanding how consumers are responding to sustainability labels, stakeholders can design a more effective marketing, pricing and awareness strategy.

## **Keywords**

Sustainability, Food labels, Food industry, Carbon neutral, Consumer behavior, Willingness to pay.

## Περίληψη

Την τελευταία δεκαετία, η βιωσιμότητα έχει αναδειχθεί σε κεντρικό ζήτημα στη βιομηχανία τροφίμων. Πολλές μελέτες δείχνουν ότι η βιομηχανική παραγωγή τροφίμων έχει σημαντική περιβαλλοντική επίπτωση. Στο πλαίσιο των στρατηγικών για την υιοθέτηση πρακτικών βιωσιμότητας, οι επιχειρήσεις προσπαθούν να επικοινωνήσουν την περιβαλλοντική τους υπευθυνότητα και να αποδείξουν ότι τα προϊόντα τους παράγονται με βιώσιμο τρόπο, γι' αυτό και χρησιμοποιούνται διάφορες επισημάνσεις / ετικέτες προϊόντων, όπως “Carbon neutral” ή “GMO – free”. Ωστόσο, η πραγματική επιρροή αυτών των επισημάνσεων στην ελληνική αγορά παραμένει αβέβαιη, ιδιαίτερα σε ένα περιβάλλον όπου τα υψηλά ποσοστά πληθωρισμού διατηρούν υψηλή την ευαισθησία των καταναλωτών ως προς την τιμή.

Σκοπός τη παρούσας μελέτης είναι να διερευνήσει το επίπεδο ενημέρωσης, κατανόησης και εμπιστοσύνης των Ελλήνων καταναλωτών σε σχέση με τις ετικέτες βιωσιμότητας. Η μελέτη εξετάζει επίσης κατά πόσο οι Έλληνες καταναλωτές είναι διατεθειμένοι να πληρώσουν περισσότερο για ένα προϊόν που φέρει ετικέτα βιωσιμότητας και σε ποιο βαθμό αυτή η διάθεση για επιπλέον πληρωμή επηρεάζεται από την κατανόηση και την εμπιστοσύνη προς τις συγκεκριμένες ετικέτες. Η έρευνα βασίζεται σε ποσοτική μεθοδολογία μέσω διαδικτυακού ερωτηματολογίου, αναλύοντας απαντήσεις από διαφορετικές δημογραφικές ομάδες, με στόχο τον εντοπισμό συσχετίσεων μεταξύ της κατανόησης και της εμπιστοσύνης στις ετικέτες και των αγοραστικών προθέσεων.

Το συγκεκριμένο θέμα συμβάλλει τόσο στο ακαδημαϊκό περιβάλλον όσο και στο πρακτικό επιχειρηματικό πεδίο. Τα αποτελέσματα θα προσφέρουν χρήσιμες πληροφορίες σε βιομηχανίες τροφίμων, λιανοπωλητές και φορείς πιστοποίησης. Κατανοώντας τον τρόπο με τον οποίο οι καταναλωτές ανταποκρίνονται στις ετικέτες βιωσιμότητας, οι εμπλεκόμενοι φορείς μπορούν να σχεδιάσουν πιο αποτελεσματικές στρατηγικές marketing, τιμολόγησης και ενημέρωσης.

### Λέξεις – Κλειδιά

Βιωσιμότητα, Ετικέτες τροφίμων, Βιομηχανία τροφίμων, Carbon neutral, Συμπεριφορά καταναλωτή, Willingness to pay.

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## List of Abbreviations & Acronyms

|          |                                 |
|----------|---------------------------------|
| GMO      | Genetically Modified Organisms  |
| LCA      | Life Cycle Assessment           |
| ASC      | Aquaculture Stewardship Council |
| MSC      | Marine Stewardship Council      |
| WTP      | Willingness to pay              |
| $\chi^2$ | chi-square test                 |
| $\alpha$ | level of significance           |
| df       | degrees of freedom              |
| RQ       | research question               |

# 1. Introduction

## 1.1 Topic of interest

Due to the impact of the environmental change, sustainability has become a priority the last decade, influencing companies, governments and consumer behavior.

The food sector is trying to follow and to adopt more sustainable practices during the production and the distribution of food products. To promote this effort companies are using sustainability labels. Some examples that the current thesis has investigated, are: “Carbon Neutral”, “BIOHELLAS”, “GMO Free” and “Fair trade”. The last 15 years the presence of the above labels has increased and indicate the environmental responsibility and the ethical production practices.

On the other hand, it’s not clear if these labels are affecting the consumer purchasing decision, especially within the Greek market, where the economic considerations are prevailed over the environmental awareness.

This thesis explores if Greek consumers understand and trust the sustainability labels and whether they are willing to pay more for such products.

## 1.2 Dissertation objectives

- Evaluate consumer’s awareness and understanding of sustainability labels. The labels that are investigated are the **Carbon Trust**, **BIO-HELLAS**, **GMO Free** and **Fair Trade**.
- Investigate how much customers trust these labels.
- Analyze the impact of sustainability labeling on consumers’ willingness to pay and purchasing decisions.
- Explore if demographics are affecting the perception and the trust of the sustainability labels.
- Provide details for food manufacturers, retailers, and policymakers on how to communicate sustainability information.

## 1.3 General Methodology & Approach

The present study investigates the level of awareness, understanding, and trust of Greek customers regarding sustainability labels. It also examines whether Greek consumers will pay a premium for a product carrying a sustainability label and the extent to which willingness to pay is influenced by understanding and trusting the labels. The study uses quantitative research via an online questionnaire, which analyzes the data by demographic groups to identify patterns and correlations of attitudes toward the environment with purchasing intentions.

This is of interest to both the academic world and the business practical world. It informs food manufacturers, retailers, and policymakers about consumer reactions to sustainability labeling, which will, in turn, help them devise an effective marketing, pricing, and awareness strategy.

## 1.4 Significance of the study

Understanding how consumers respond to sustainability labels holds great significance for multiple stakeholders:

- Businesses: Provides details on how the customers perceive sustainability labels, hence they can differentiate their products.
- Policymakers: Offers guidance for a more effective way of designing the regulatory framework.
- Academics: Contributes to the consumer's behavior and sustainability marketing literature.
- Greek consumers: Purchasing decisions in Greece are influenced mainly by price, so this study is trying to understand how to increase the sustainability awareness.

## 1.5 Main limitations

This dissertation is subject to certain limitations.

Usually, data collection via online surveys introduces sampling bias, as it primarily targets consumers who have internet access and interest in sustainability topics.

Additionally, the final sample size (n=202) it is relatively low.

## 1.6 Thesis structure

The dissertation is organized into four chapters.

- **Chapter 1** introduces the research topic, objectives, and significance.
- **Chapter 2** presents a comprehensive literature review and examples from the international environment. It also presents the theoretical foundation of customer's perception of sustainability labels and their willingness to pay more for sustainably produced products. This chapter also describes the main regulatory framework related with the food labelling in EU and finally, it presents the main sustainability labels that are investigated.
- **Chapter 3** outlines the research methodology, including survey design, data collection, and analytical methods.
- **Chapter 4** presents and interprets the quantitative results. The analysis examines the effect of price on consumers' willingness to purchase sustainably labeled products.

## 2 Literature review and international experience

### 2.1 Theoretical Foundations

The theoretical frame of the current study are the **stakeholder theory**, the **signaling theory** and various consumer behavior models such as the **theory of planned behavior**. These theories describes how individuals interpret information, form attitudes, and ultimately make purchasing decisions.

#### Stakeholder theory (Freeman, 1984)

According to the stakeholder theory, businesses should act in the best interests of various stakeholder groups, such as communities, customers, and the environment. According to this theory business success depends on creating value for all stakeholders rather than maximizing profit.

Sustainability labels in food products are aligned with this theory since they communicate that a company recognizes its environmental responsibilities. Companies that are using labels such as “carbon neutral” or “GMO-free” are making a statement that they are aligned with the need for products that are environmentally friendly.

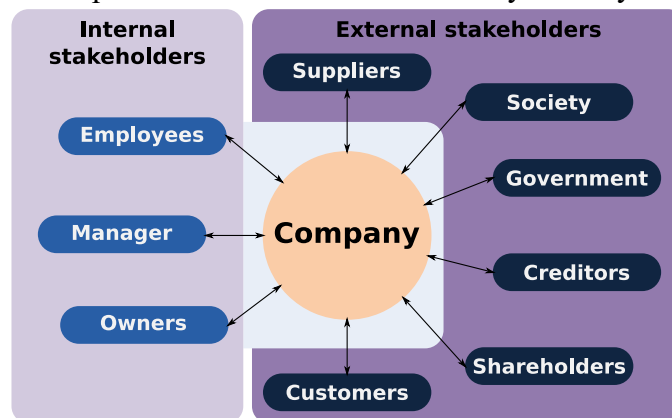


Figure 1 Stakeholder theory

#### Signaling theory (Spence, 1973)

The signaling theory, developed by Michael Spence, explains how, under information asymmetry, individuals use signals (in this case the sustainability labels) to provides information about themselves to another party, in that case consumers. There is an information asymmetry between consumers and food producing companies. Producers know far more details about the production and the environmental impact than the consumers. The third-party sustainability labels serve as a signal that reduce uncertainty by assuring consumers that certain environmental or ethical standards have been met.

#### Theory of planned behavior

The theory of planned behavior (TPB) is the psychological theory that links beliefs to behavior. This theory was developed from Icek Ajzen in 1991 and the main idea is that every person’s behavior is determined from his intention to perform it. The main three components of this theory are attitude, subjective norm and perceived behavioral control.

The main scope of the current dissertation thesis is to examine:

- The understanding of the sustainability labels
- The consumer’s trust to these labels
- The purchase due to a label
- The willingness to pay more for a product with a sustainability label

In this study the **attitude** can be linked with the trust index. The trust is the main variable that determines the positive impact of the sustainability labels for the consumers. **The perceived behavioral control** is linked with the variables understanding, income and willingness to pay. The results of these variables set the value of the perceived control. **The subjective norm** examines how the society perceives a specific behavior. The current study is linked with this pillar with the first section of the questionnaire that examines the demographics of the consumers.

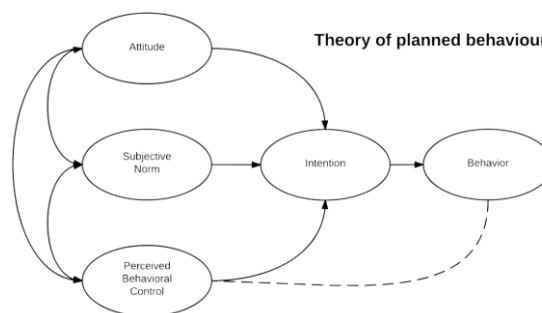


Figure 2 Theory of planned behavior

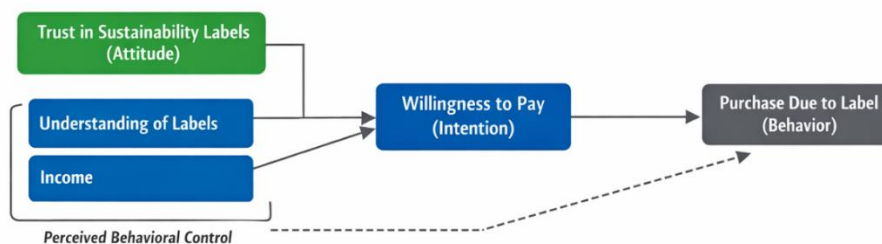


Figure 3 Link of the Theory of planned behavior with the study

## 2.2 Sustainability in food production

Sustainability has become a priority the last fifteen years for the big industries. The food industry follows since the environmental impact of the industrial food production is increased. The food needs to be processed, transported and distributed; each step of this procedure creates greenhouse gases that contribute to climate change. Apart from the greenhouse emissions the food sector also contributes to increased water consumption and packaging waste. As a result, the food industry faces a pressure to reduce the environmental impact and comply with the new regulations.

The industrial food production can be categorized as follows: Agriculture and land use, Industrial processes, Packaging, Distribution and Management of food waste.

According to the “Food and Agriculture Organization of the United Nations” **Agrifood systems** account for about one-third of total anthropogenic greenhouse gas emissions. Many companies are now investing in various practices in order enhance biodiversity and reduce carbon emissions.

Sustainability also extends to the **industrial production stage**. Energy-efficient technologies such as heat recovery systems, renewable energy sources, and optimized processing equipment are adopted by food manufacturers. These advancements help reduce energy consumption, lower carbon emissions, and improve operational efficiency.

**Packaging** has emerged as one of the most critical areas for sustainable transformation. Many companies are trying to reduce the plastic materials in the food containers they are using and are adopting materials that can be recycled. The main target is to reduce food packaging waste. The food packaging waste statistics are indicating that when we are producing and throw away the food containers we are contributing to the issue of climate degradation.

## 2.3 EU legislation

Over the last fifteen years, the European Union has developed a stricter regulatory framework to highlight the sustainability, transparency, and consumer protection in the food sector. This evolution in the regulatory framework is reflecting the increased environmental concerns, demand for food safety, and traceability in food production. This chapter presents the main and most important EU regulations related to food production.

### 2.3.1 Historical progression

The last fifteen years EU has been developing a regulatory framework oriented to sustainable food production. Previous laws, such as Council Regulation (EC) No 834/2007 on organic production and labelling, set the groundwork for the sustainability-oriented food regulation. Gaps and irregularities appeared over time, particularly as the organic industry grew. On May 30, 2018, the European Parliament and Council passed Regulation (EU) 2018/848 on organic production and labeling of organic products, a comprehensive legal act that replaced the previous regulation in order to modernize and strengthen standards. [Legislation.gov.uk+2Agriculture and rural development+2](#)

With effect from January 1, 2022, the new regulation aims to prevent fraud while boosting consumer trust, strengthen control and certification systems, and harmonize organic production regulations across all EU member states. Regulation (EU) 2015/2283 on Novel Foods, for instance, was adopted by the EU in 2015 and updated the regulations governing the approval and market entry of novel or previously unutilized food items. [Agriculture and rural development+1](#)

To improve transparency, the validity of scientific evaluations, and the governance of the European Food Safety Authority (EFSA), changes to the general legal framework governing food chain risk assessment were implemented in 2019. [Food Safety](#)

Furthermore, in order to support resource efficiency, sustainable farming, biodiversity, and lower emissions, the EU connects its agricultural, environmental, and climate goals with food production through its broad policies, most notably the Green Deal and the Farm to Fork Strategy. [European Commission+1](#)

### 2.3.2 Key laws on sustainability-related food labelling

#### **Regulation (EU) 2018/848 on Organic Production and Labelling.**

This is the main EU law that controls food processing, labeling, and organic farming. The EU organic logo can only be used on goods that adhere to these regulations.

[Legislation.gov.uk+2](#)[Legislation.gov.uk+2](#)

#### **Novel Food Regulation (EU) 2015/2283**

This regulation frames the approval and marketing of new or previously unused food products. Although this legislation is not fully related with “sustainability-label legislation,” it describes a framework on how sustainable or alternative-protein foods can legally enter the EU food market.

[Food Safety](#)

#### **General Food Law & Transparency of Risk Assessment (2019 reform)**

With the 2019 amendments, the “General Food Law & Transparency of Risk Assessment” the EU aims to increase the transparency in the food chain by strengthening the reliability, objectivity and independence of the studies used by European Food Safety Authority (EFSA), and revisiting the governance of EFSA in order to ensure its long-term sustainability.

[Food Safety+1](#)

#### **Labelling and Standards Regulation (food-safety framework)**

Further to the above organic-specific laws, the EU has developed a regulatory framework for the labelling of packaged food. All food products should display accurate and non-misleading information regarding the ingredients, nutritional content, allergens, and other claims (e.g. “GMO-free,” “vegan,” “vegetarian,” “organic”).

[European Commission+1](#)

## 2.4 International experience

This chapter presents some examples from big food companies worldwide that have adopted sustainable practices in the food production and packaging. Since sustainability has become a priority, the major industry players have implemented specific strategies to minimize packaging waste and increase recycling. The pressures from the regulatory framework with the increased consumers awareness on the sustainability are pushing to this direction, indicating that sustainability is a process that companies cannot ignore.

### Tetra Pak

Tetra Pak is one of the key global players in the food packaging solutions. Tetra Pak has adopted various sustainability strategies to reduce the carbon footprint of the packages. The life cycle assessment catalogue (LCA) presented on Tetra Pak’s website gives us a collection studies that are evaluating the beverages carton packaging impact across different product categories and areas. Tetra Pak is publishing LCA studies since the 1980s in order to better understand, communicate and improve the environmental performance of the packaging solutions. In continuations of these studies Tetra Pak has adopted the “Go nature. Go carton” initiative to promote low-carbon produced carton and to support the transparent sustainability communication to customers. The “carbon trust” label that is investigated in the current thesis is adopted in all Tetra Pak packages.



Figure 4 Tetra Pak carton package

It’s important also to mention that company has also developed the world’s first fully renewable beverage carton made entirely of plat-based materials.

### Nestlé

Nestlé is one of the biggest food manufacturers in the world and has also adopted sustainability initiatives in the packaging strategy. The main vision as stated in their website is “None of our packaging ends up in landfills or as litter”. To achieve this goal Nestlé adopted a strategy that includes less use of virgin plastic, improved recyclability and development of alternative materials.



Figure 5 Nestle package example

This strategy can be described as the five-pillar packaging strategy:

- Less packaging – Reduce
- Less packaging – Reuse and refill
- Better packaging – Redesign
- Better system – Recycle

- Better system – Rethinking behaviors

The current thesis focuses in the fifth pillar: “Rethinking behaviors”. Nestlé is working to standardize the communication for all products to ensure that consumers will understand how to dispose the packages. This work includes *environmental claims* for packaging to indicate the environmental aspect of the packages, this is performed with the use statements, symbols or graphics on the packages.

## Unilever

Unilever and the food department (Unilever foods) in also focusing on the sustainability impact of its products. New and better packaging materials are introduced and the term circulation is adopted in the majority of the products. A key step to the sustainability strategy was on 2021, during this year Unilever introduced the carbon footprint label on its products for the first time. Unilever introduced the idea of “carbon-neutral or carbon-friendly” aisles in the supermarkets, just like the “vegetarian aisles” to help consumers make greener choices.



Figure 6 Super Market Carbon-Neutral areas

## Foundation Earth initiative

It is important to mention the *Foundation Earth* initiative for the environmental labelling in food products. This is a pilot project that is already implemented in various food products. Foundation earth is an independent and non-profit organization that works on introducing the environmental impact labels on food products. These labels are helping businesses build a more resilient and environmentally sustainable food system while giving consumers the tools they need to make sustainable buying choices.

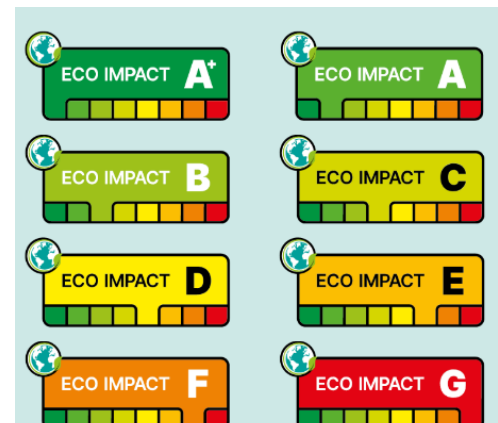


Figure 7 Eco impact labels

This system evaluates the sustainability impact of a food product with a A+ to G scale and takes into account various sustainability variables such as: carbon footprint, water use, water pollution, biodiversity loss, land use and resource use. This system is already adopted from various retailers UK such as the “Abel & Cole” and the “Meatless Farm”.

## 2.5 Sustainability labels

The following paragraphs presents a short description of the labels that the current study examines. A short presentation follows indicating some additional sustainable related labels that are not consider in this thesis.

### 2.5.1 Carbon Trust

The Carbon Trust label verification was introduced in 2007 by the Carbon Trust foundation in UK. Carbon Trust foundation is a non-profit and independent organization founded by the UK government back in 2001. The unique purpose of the Carbon Trust is to drive and promote the decarbonization for businesses, governments and financial institutions.

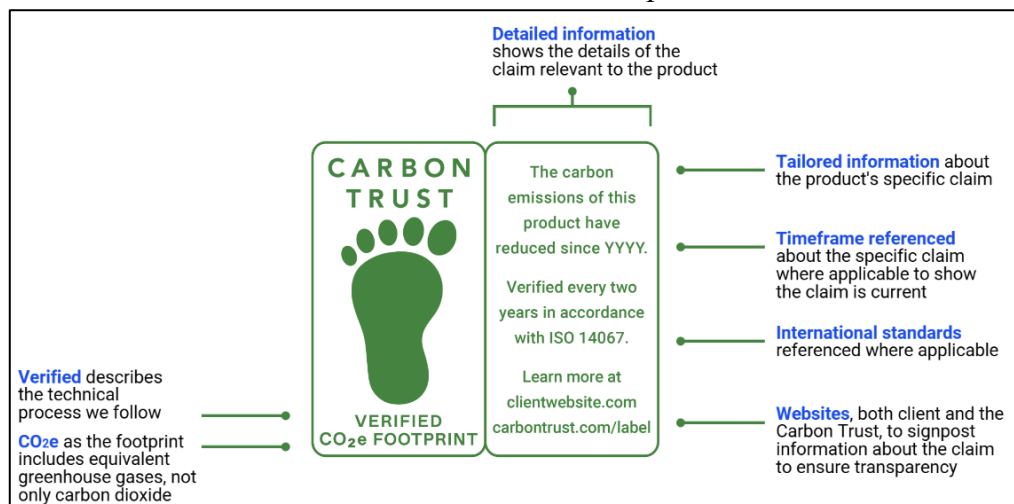
In 2007 Carbon Trust launched the world’s first carbon footprint label. The life cycle carbon footprint measures the total greenhouse gas emissions generated



**Figure 8 Carbon Trust Label**

by a product, from the extraction of raw materials to the life end and it is measured in carbon dioxide equivalents (CO<sub>2</sub>e). The carbon trust label primarily indicates that the product’s carbon footprint is measured and verified and additionally it shows that the footprint is reducing year-on-year, and that the company has committed to achieve footprint reduction. This verification is based on the Life Cycle Assessment in accordance with the standards PAS 2050 or ISO 1400678. The emphasis on continuous improvement distinguishes the Carbon Trust label from purely descriptive environmental claims.

#### Carbon Trust Label description:



**Figure 9 Carbon trust label description**

### 2.5.2 BIO Hellas – “Euro leaf”

The BIO Hellas and ‘Euro-leaf’ labels are related with the organic agriculture and the organic food production within the European Union.

BIO Hellas is an approved Inspection and Certification Body for Organic Products, founded in 2001. It operates in accordance

with European Union regulations on organic farming and is officially recognized by the Greek Ministry of Rural Development and Food. BIO Hellas certifies that a product has been produced using organic methods and can be characterized as “organic”.

The BIO Hellas logo usually is accompanied with the “Euro – leaf” logo. The EU organic logo or “Euro – leaf” logo was introduced on 2010 and became mandatory for all the organic pre-packaged products produced in the EU in 2012. In addition to the pre-packaged organic produced and sold products, the “Euro-leaf” can be also optionally used by:

- Imported products that comply with the EU regulations for the organic production
- Non-pre-packaged products
- EU organic products exported to third country markets and
- As part of education campaigns to educate consumers about the organic production.

The above logos were introduced in the Greek market and in the EU in general, to reflect the increasing demand of the consumers of organic products. The organic production was heavily increased the last 20 years but the lack of a general framework and standard created mistrust. These logos were adopted to resolve this issue and to clearly communicate to consumers which product can be considered as organic. In practical term, a product with the BIO Hellas certification and the Euro-leaf logo is produced, processed and handled according to organic principles throughout the supply chain. This includes soil management, biodiversity protection, crop rotation, and environmentally friendly farming techniques.



**Figure 10 BIOHELLAS & Euro-leaf logo**



**Figure 11 BIOHELLAS & Euro-leaf logo example**

### 2.5.3 GMO Free

The “GMO Free” label refers to products that are produced without the use of genetically modified organisms at any stage of the production process. In addition, with the “Euro-leaf” or the “Carbon trust” logo, the “GMO free” is not an obligation from the producer or the supplier, it is a voluntary certification provided from various certification and inspection companies. Some examples are the “Non-GMO project” in USA or the “TUV” in Austria.



**Figure 12 GMO Label**

The production of food products with Genetically Modified Organisms (GMO) started during the 1990s. On 2003 the regulation (EC) No 1829/2003 on genetically modified food and feed was adopted and then all the producers that were using GMO were obliged to have a label indicating the use of GMO.

However, since the early 2000s various private companies and certification bodies emerged and provide the GMO-free certification to communicate to customer the non-GMO use. In practical terms the “GMO-free” label is a voluntary marketing claim.

It is important to mention that the use of the “Euro-leaf” logo in reality certifies that the product is also GMO free, the EU agriculture production doesn’t allow the use of GMO according the Regulation (EU) 2018/848 on Organic Production.

#### 2.5.4 Fair Trade

The Fair-Trade label is one of the oldest sustainability certifications in food industry. The Fair-Trade label was introduced in 1988 in Netherlands. The first product to receive this certification was a coffee brand imported from Mexico and the label was “Max Havelaar Fairtrade Label”. The purpose of this label is to certify that the producers in developing countries are receiving a fair price for their products. It’s a label that targets on social equity, ethical trading practices and on the protections of the producers.



Figure 13 Fair Trade Label

In the 1990s many national “fair trade” labels were introduced in Europe. In order to develop a unique strategy and standards, on 1997 the “Fairtrade International” was established. It is a non-profit and product-oriented group aimed to support the lives of farmers and workers through fair trade.

The “Fair-Trade” certification is given from the independent certification body “FLOCERT”. Producers are audited from the certification body and the main criteria for the certification are:

- Social standards, such as fair wages, safe working conditions, prohibition of forced and child labor, and democratic organization of producer groups.
- Environmental standards, such as restrictions on hazardous agrochemicals and sustainable farming practices.

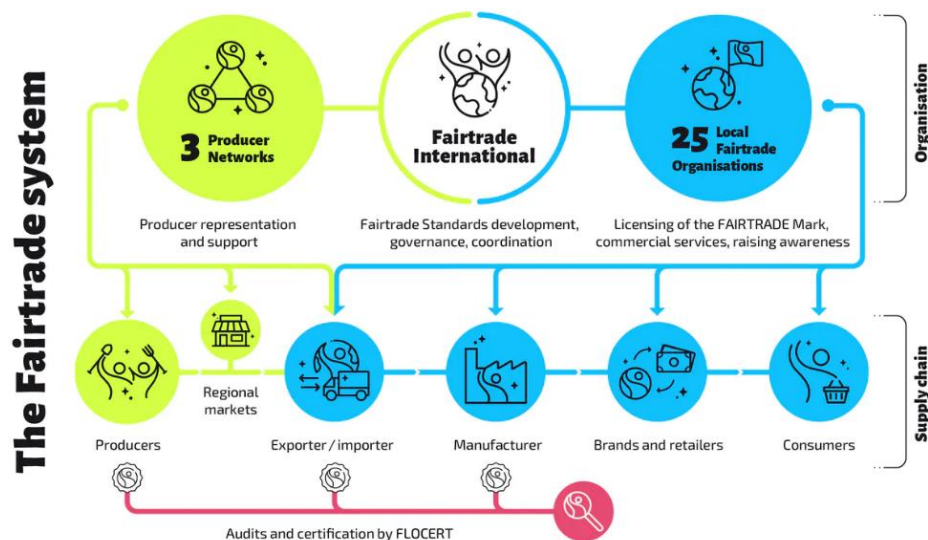


Figure 14 The Fairtrade system

The here below table summarize the labels that are investigated in the current study and describes the presence of these labels in the Greek market:

| Sustainability Label                                                                                                              | Presence in the Greek Food Market |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| <b>Carbon Trust</b><br>                          | Limited / Indirect                |
| <b>BIO Hellas – EU Organic (“Euro-leaf”)</b><br> | Widespread                        |
| <b>GMO Free</b><br>                             | Moderate / Selective              |
| <b>Fair Trade</b><br>                          | Moderate                          |

**Table 1 Sustainability labels investigated**

### 2.5.5 Other Labels

Further to the sustainability labels examined in this study, a wide range of other certifications and labels are used in the agri-food and consumer goods industry to communicate environmental, social, and ethical characteristics. These labels typically focus on specific aspects of sustainability or particular stages of the production.

The following table is presenting some additional sustainability related labels on food products that are not included in the current. These labels were excluded from the study since they are represented in the Greek market or their appearance is rare and as a result the consumers awareness would be limited. The table also includes the “Vegan” label since it is very common and easily recognized from the consumers, however this label is mainly related with nutrition habits and not with sustainability practices from the producers, hence it was not considered in the study.

| Sustainability Label                                                                                                           | Presence in the Greek Food Market | Typical Product Categories / Remarks                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Vegan free</b><br>                        | Widespread                        | Certifies that the product doesn't contain animal origin ingredients and no animal derivatives or animal testing was used during production                                      |
| <b>Rainforest alliance</b><br>              | Widespread                        | Certifies that the raw materials are produced from farms that implement sustainable farming practices and biodiversity protection. Can be seen in coffee, chocolate and bananas. |
| <b>Forest Stewardship Council (FSC)</b><br> | Widespread                        | This label certifies that the paper or the wood used for the package is produced in forests where the biodiversity, workers' rights and local communities are protected.         |
| <b>Marine Stewardship Council (MSC)</b><br> | Moderate                          | This label declares that the sea food products are coming from fisheries that protect the marine ecosystem and their production has adopted sustainable practices.               |
| <b>Aquaculture Stewardship Council (ASC)</b>                                                                                   | Moderate                          | The ASC label certifies that the aquaculture is using sustainable and environmental responsible                                                                                  |

|                                                                                   |         |                                                                                                                                                        |
|-----------------------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |         | practices. Can be seen mainly on imported products                                                                                                     |
|  | Limited | Present mainly for the food producers and not for the consumers. Certifies that the company uses standards that are reducing the environmental impact. |

**Table 2 Other sustainability labels**

The growing variety of sustainability labels in the food industry indicates the need of the industry to communicate the sustainable practices and convince the consumers of their credibility. Furthermore, this variety also illustrates the diversity and the complexity of sustainability communication. This study focuses on four labels that cover different aspects of the sustainability. Through a questionnaire, which will be presented in the next chapter, customer’s trust, awareness and willingness to pay are evaluated.

### 3. Methodology

#### 3.1 Research questions

The objective of this research is to examine the influence of sustainability labels on consumer food purchasing decisions in the Greek market. The study focuses in four variables: consumers' awareness, understanding, trust in sustainability labels, and willingness to pay a price premium for products with a sustainability label. The above data were collected through an online structured questionnaire.

Based on the objectives of the study, the following research questions are formulated to guide the quantitative investigation:

- RQ1** To what extent do Greek consumers recognize and understand sustainability labels on food products?
- RQ2** How much do consumers trust sustainability labels related to environmental and ethical food production?
- RQ3** Does the level of understanding and trust in sustainability labels influence consumers' purchasing decisions?
- RQ4** Are Greek consumers willing to pay a price premium for food products carrying sustainability labels?
- RQ5** How do demographic factors (such as income, education, and age) affect consumers' understanding of sustainability labels and their willingness to pay more for sustainable food products?

#### 3.2 Quantative research method

The questionnaire data are analyzed with the **quantative research methodology**. Quantitative research enables statistical analysis to identify behavioral trends and statistical correlations; hence it is considered appropriate for this study.

The collected data are analyzed using descriptive statistics and inferential statistics to explore the relationship between the variables. The statistical analyses applied in this study are **logistic regression**, **multiple linear regression**, **chi-square tests** and analysis of variance (ANOVA). As an advanced element the study also applies **composite index creation** for the development of cleaner regression models, **mediation analysis** to evaluate if certain variables affect the willingness to pay and **cluster analysis** for the consumer segmentation. Finally, cluster analysis is further examined with **moderation analysis** for specific variables.

### 3.3 Survey design

Data collection: responses were collected over a period of 65 days (from 15/11/2025 to 19/01/2026). The questionnaire was designed in **Microsoft Forms**, the online format ensured anonymity, and allows the automated data export into spreadsheet. The software used is **Microsoft Excel**.

The questionnaire was designed based on review of the academic literature and it focuses in four variables: consumers’ awareness and understanding, trust in sustainability labels, and the willingness to pay (WTP). It also examines the demographics of the responses and the consumer’s purchasing habits. Most attitudinal questions were measured using five-point Likert scales to facilitate quantitative analysis.

The survey consists of five main sections, which are presented in the following tables.

## Section A Demographics

**Table 3 Section A Demographics**

| Question # | Question           | Available answers                                                         | Question type                                 | Linked research question |
|------------|--------------------|---------------------------------------------------------------------------|-----------------------------------------------|--------------------------|
| 1          | Gender             | - Male<br>- Female<br>- Other<br>- Prefer not to say                      | Closed-ended, multiple choice (single answer) | RQ5                      |
| 2          | Age                | - 18-25<br>- 26-35<br>- 36-45<br>- 56+                                    | Closed-ended, multiple choice (ordinal)       | RQ5                      |
| 3          | Education level    | - High School<br>- Bachelor's<br>- Master's<br>- PhD<br>- Other           | Closed-ended, multiple choice (ordinal)       | RQ5                      |
| 4          | Monthly net income | - <900€<br>- 900–1500€<br>- 1500–2500€<br>- >2500€<br>- Prefer not to say | Closed-ended, multiple choice (ordinal)       | RQ5                      |
| 5          | Place of residence | - Urban<br>- Semi-urban<br>- Rural                                        | Closed-ended, multiple choice (nominal)       | RQ5                      |

## Section B Purchasing Habits

Section B focuses on respondents’ general food purchasing habits and the importance they assign to sustainability during food purchases.

**Table 4 Section B Purchasing Habits**

| Question # | Question                                                                                                   | Available answers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Question type                                            | Linked research question                   |
|------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------|
| 6          | How often do you buy food products from supermarkets or grocery stores?                                    | <ul style="list-style-type: none"> <li>- Daily</li> <li>- 2–3 times/week</li> <li>- Once/week</li> <li>- Rarely</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Closed-ended, multiple choice (ordinal)                  | General, indicating the purchasing habits. |
| 7          | When buying food and drink products, how often do you look for the following information on the packaging? | <ul style="list-style-type: none"> <li>- Price</li> <li>- Best before/use by date</li> <li>- Quantity/size of product</li> <li>- Brand</li> <li>- Ingredients list</li> <li>- Nutritional benefits (e.g. low fat, reduced salt)</li> <li>- Cooking instructions</li> <li>- Nutrition information</li> <li>- Country of origin</li> <li>- Portion information</li> <li>- Health benefits (e.g. lowers cholesterol, good for bones)</li> <li>- Health logo/symbol (such as “Good for you” logo)</li> <li>- Organic status</li> <li>- Environmental impact (e.g. production, transport)</li> <li>- Ethical impact (e.g. working conditions, fairtrade)</li> <li>- Allergy information</li> </ul> | Closed-ended, multiple choice (multiple answers allowed) | General, indicating the purchasing habits. |
| 8          | How important is sustainability in your food purchasing decisions?                                         | <ul style="list-style-type: none"> <li>- Not at all</li> <li>- Slightly</li> <li>- Moderately</li> <li>- Very</li> <li>- Extremely</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Likert scale (5-point, ordinal)                          | RQ3                                        |

## Section C Understanding of Sustainability Labels

Section C assesses awareness, understanding, and trust in specific sustainability labels, namely Carbon Trust, BIOHELLAS (Euro-leaf), GMO Free, and Fair Trade.

**Table 5 Section C Understanding of Sustainability Labels**

| Question # | Question                                                                                                                                                   | Available answers                                                   | Question type                               | Linked research question |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------|--------------------------|
| 9          | Have you noticed the "Carbon Trust" label?<br>                            | - Yes<br>- No<br>- Not sure                                         | Closed-ended, dichotomous (Yes/No/Not sure) | RQ1                      |
| 10         | Have you noticed the "GMO Free" label?<br>                              | - Yes<br>- No<br>- Not sure                                         | Closed-ended, dichotomous (Yes/No/Not sure) | RQ1                      |
| 11         | Have you noticed the "BIOHELLAS" label?<br>                             | - Yes<br>- No<br>- Not sure                                         | Closed-ended, dichotomous (Yes/No/Not sure) | RQ1                      |
| 12         | Have you noticed the "Fair Trade" label?<br>                            | - Yes<br>- No<br>- Not sure                                         | Closed-ended, dichotomous (Yes/No/Not sure) | RQ1                      |
| 13         | How well do you understand the meaning of the "Carbon Trust" label?<br> | - Not at all<br>- Slightly<br>- Moderately<br>- Well<br>- Very well | Likert scale (5-point, ordinal)             | RQ1                      |

|    |                                                                                                                                                          |                                                                                                                                               |                                 |     |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----|
| 14 | How well do you understand the meaning of the "GMO Free" label?<br>     | <ul style="list-style-type: none"> <li>- Not at all</li> <li>- Slightly</li> <li>- Moderately</li> <li>- Well</li> <li>- Very well</li> </ul> | Likert scale (5-point, ordinal) | RQ1 |
| 15 | How well do you understand the meaning of the "BIOHELLAS" label?<br>    | <ul style="list-style-type: none"> <li>- Not at all</li> <li>- Slightly</li> <li>- Moderately</li> <li>- Well</li> <li>- Very well</li> </ul> | Likert scale (5-point, ordinal) | RQ1 |
| 16 | How well do you understand the meaning of the "Fair Trade" label?<br> | <ul style="list-style-type: none"> <li>- Not at all</li> <li>- Slightly</li> <li>- Moderately</li> <li>- Well</li> <li>- Very well</li> </ul> | Likert scale (5-point, ordinal) | RQ1 |
| 17 | How much do you trust the information provided by these labels?                                                                                          | <ul style="list-style-type: none"> <li>- Not at all</li> <li>- Slightly</li> <li>- Moderately</li> <li>- Well</li> <li>- Very well</li> </ul> | Likert scale (5-point, ordinal) | RQ2 |
| 18 | Do you believe that these labels accurately reflect the sustainability or safety of the product?                                                         | <ul style="list-style-type: none"> <li>- Yes</li> <li>- No</li> <li>- Not sure</li> </ul>                                                     | Closed-ended, multiple choice   | RQ2 |

## Section D Purchasing Behavior & Willingness to Pay

Section D examines purchasing behavior and willingness to pay for products carrying sustainability labels

**Table 6 Section D Purchasing Behavior & Willingness to Pay**

| Question # | Question                                                                                                                                                        | Available answers                                                       | Question type                           | Linked research question |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------|--------------------------|
| 19         | Have you ever purchased a product specifically because of its sustainability label?                                                                             | - Yes<br>- No                                                           | Closed-ended, dichotomous (Yes/No)      | RQ3<br>RQ4               |
| 20         | Would you be willing to pay more for a product with a sustainability label?                                                                                     | - No<br>- Yes, up to 5%<br>- 5-10%<br>- 10-20%<br>- >20%                | Closed-ended, multiple choice (ordinal) | RQ3<br>RQ4               |
| 21         | What level of price increase do you consider acceptable for a "Carbon Neutral», «GMO Free", "BIOHELLAS" or "Fair Trade" product compared to a conventional one? | - None<br>- Small<br>- Moderate<br>- High                               | Closed-ended, multiple choice (ordinal) | RQ3<br>RQ4               |
| 22         | If two products have the same price, how likely are you to choose the one with a sustainability label?                                                          | - Very unlikely<br>- Unlikely<br>- Neutral<br>- Likely<br>- Very Likely | Likert scale (5-point, ordinal)         | RQ3<br>RQ4               |

## Section E Final Opinions

Section E captures respondents’ overall perceptions and attitudes toward sustainability labels.

**Table 7 Section E Final Opinions**

| Question # | Question                                                                                | Available answers                                                                                                                                                                                      | Question type                                            | Linked research question |
|------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------|
| 23         | Which factors would make you trust a sustainability label more? (Multiple choice)       | <ul style="list-style-type: none"> <li>- Recognized certification body</li> <li>- Awareness campaigns</li> <li>- Company transparency</li> <li>- Legislation &amp; control</li> <li>- Other</li> </ul> | Closed-ended, multiple choice (multiple answers allowed) | N/A                      |
| 24         | Do you believe that such labels contribute to more responsible consumer behavior?       | <ul style="list-style-type: none"> <li>- Yes</li> <li>- No</li> <li>- Not sure</li> </ul>                                                                                                              | Closed-ended, multiple choice (Yes/No/Not sure)          | N/A                      |
| 25         | Would you like to be better informed about sustainability labels and company practices? | <ul style="list-style-type: none"> <li>- Yes</li> <li>- No</li> </ul>                                                                                                                                  | Closed-ended, dichotomous (Yes/No)                       | N/A                      |

### 3.4 Target population and sample

The target population of this research consists of adult consumers in Greece who are regularly involved in food purchasing decisions for themselves or their households. There were no restrictions regarding gender, educational background, place of residence or income level, in order to capture as many consumers profiles as possible.

The **sampling strategy** is non- probabilistic (i.e., selecting the items or individuals without knowing their probabilities of selection (Berenson, Levine, Szabat, & Stephan, 2012)) which is commonly used in consumer behavior studies. This approach was also considered appropriate given the time constraints of the research and the objective of gathering replies from a broad variety of consumers with different levels of sustainability awareness and sensitivity.

The targeted sample size was approximately 200 to 300 respondents, which is sufficient for basic statistical testing (correlation, regression analysis or ANOVA). The final sample size is **202 participants** and it was collected over a period of 65 days.

**Distribution:** The survey link was shared via professional networking platforms such as **LinkedIn**, through **instant messaging applications**, through **Facebook posts** and via **email distribution lists provided by the university**. The questionnaire was also shared in **specific social media groups related with food, sustainability, and environmental awareness**, in order to reach respondents with an interest in the research topic.

Due to the non-random sampling method, the sample cannot be considered fully representative of the entire Greek population. However, it provides valuable empirical evidence and supports the main objectives of the dissertation.

**Data Privacy:** Upon conclusion of the study, all stored data will be deleted.

### 3.5 Limitation and challenges

Despite the careful design and implementation of this research, several limitations and challenges should be acknowledged when interpreting the findings.

**Sampling bias:** The first limitation is related with the distribution method used for sharing the questionnaire. The questionnaire was distributed mainly through online channels focused on food sustainability and environmental issues. Hence, most of the replies may come from people that are positively placed towards sustainability and this may introduce the possibility of self-selection bias. As a result, the received data may overestimate levels of label awareness, understanding, trust, and willingness to pay.

**Sample size:** An important limitation is also the final sample size. Even if the final size of the sample ( $n = 202$ ) is considered enough for the application of the statistical techniques, a larger sample would present improved results. However, because of academic deadlines, the data collection period was specific, and after achieving more than 200 responses the survey was closed.

**Self-reporting data:** Furthermore, the study is based on self-reported data, this may be subject to response bias. Consumers might reply with a positive environmental attitude or willingness to pay for sustainable products due to social desirability effects, instead of representing actual purchasing behavior.

## 4. Empirical Evidence and Findings

### 4.1 Data analysis and findings

#### Section A – Demographics

##### 1. Gender

| Gender             | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| Man                | 124        | 61,39%         | 61,39%         | 61,39%       |
| Prefer not to say  | 4          | 1,98%          | 1,98%          | 63,37%       |
| Woman              | 74         | 36,63%         | 36,63%         | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 8 Gender

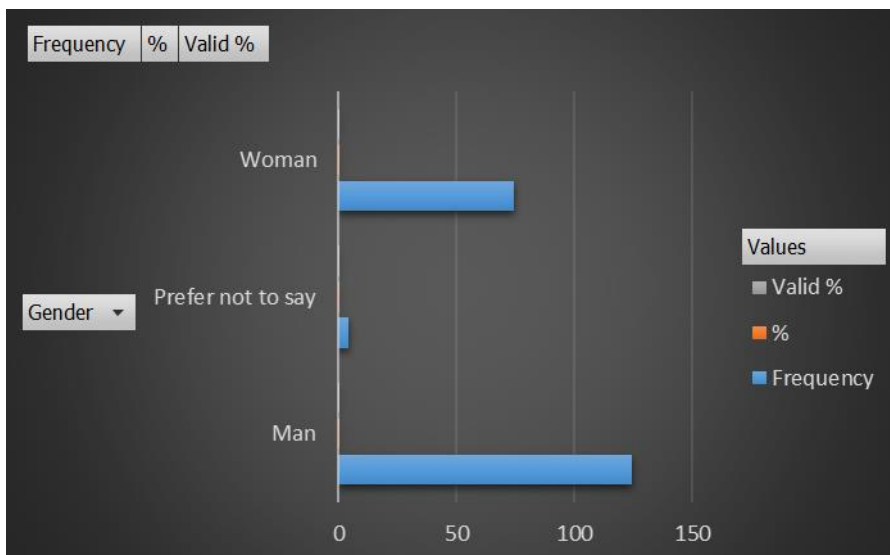


Figure 15 Gender

The gender distribution of the respondents indicates a higher participation of men (124 respondents), followed by women (74 respondents), while a very small proportion of participants preferred not to say (4 respondents). This indicates a sample represented mainly by males.

## 2. Age

| Age                | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| 18-25              | 2          | 0,99%          | 0,99%          | 0,99%        |
| 26-35              | 32         | 15,84%         | 15,84%         | 16,83%       |
| 36-45              | 136        | 67,33%         | 67,33%         | 84,16%       |
| 46-55              | 26         | 12,87%         | 12,87%         | 97,03%       |
| 56+                | 6          | 2,97%          | 2,97%          | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 9 Age

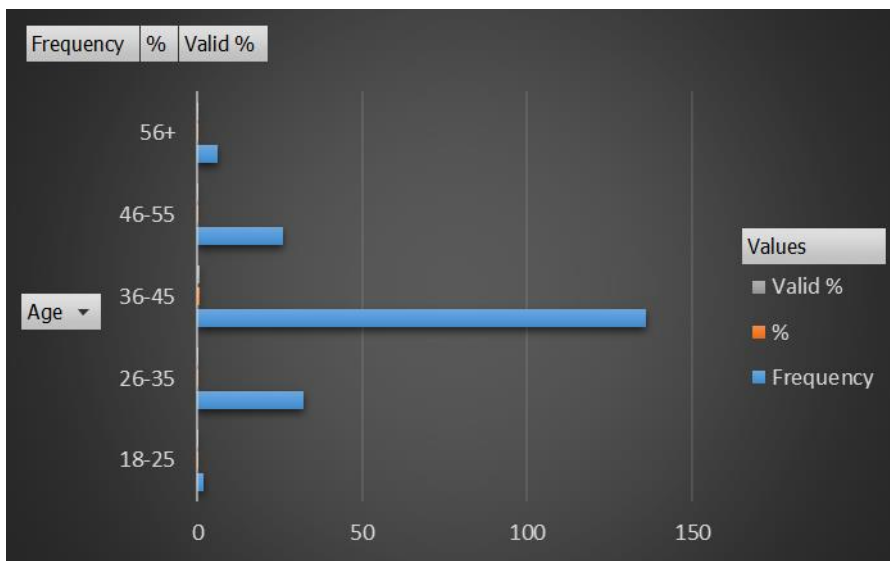


Figure 15 Age

The age distribution of the respondents shows a strong concentration in the 36–45 age group (136 respondents). This is followed by the 26–35 age group (32 respondents) and the 46–55 group (26 respondents), while very limited participation is observed among younger respondents aged 18–25 (2 respondents) and older participants aged 56 and above (6 respondents).

**Education level and income** were further analyzed to examine their potential relationship with consumers’ willingness to pay for products with a sustainable label. The statistical methods used are ANOVA to identify statistically significant differences in willingness to pay across the respective demographic groups and Multiple linear regression to identify which factors most strongly drive the WTP.

The results of this study will be presented in Section D – Purchasing Behavior & Willingness to Pay. The results are linked with the research question no 5:

*How do demographic factors (such as income, education, and age) affect consumers’ understanding of sustainability labels and their willingness to pay more for sustainable food products?*

### 3. Education Level

| Education level    | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| Bachelor’s         | 35         | 17,33%         | 17,33%         | 17,33%       |
| High School        | 4          | 1,98%          | 1,98%          | 19,31%       |
| Master’s           | 156        | 77,23%         | 77,23%         | 96,53%       |
| PhD                | 7          | 3,47%          | 3,47%          | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 10 Education Level

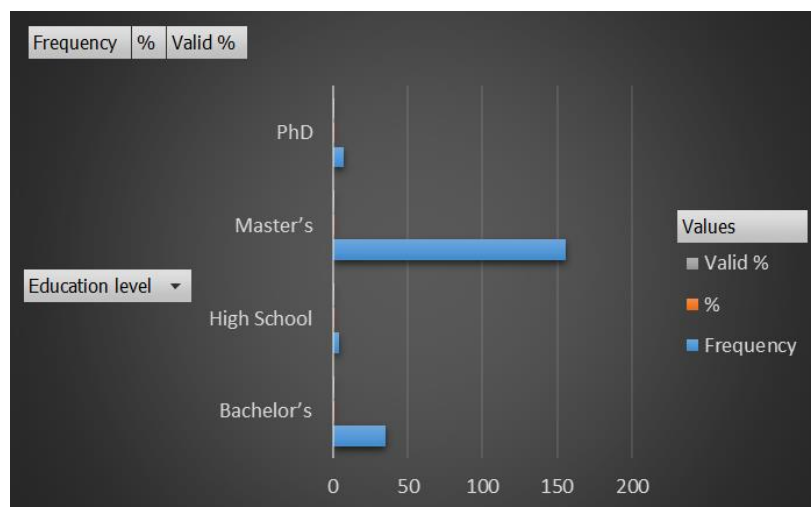


Figure 16 Education level

Most of the replies indicate that the majority holds a Master’s degree (156 respondents) and Bachelor’s degree represents a smaller but still significant share of the sample (35 respondents). Replies with PhD (7 respondents) or High School (4 respondents) are very limited. This distribution indicates a highly educated sample, which may influence attitudes toward sustainability and willingness to pay. Education level will be further examined using linear and logistic regression.

#### 4. Monthly net Income

| Monthly net income | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| < 900 €            | 9          | 4,46%          | 4,46%          | 4,46%        |
| > 2500 €           | 46         | 22,77%         | 22,77%         | 27,23%       |
| 1500–2500 €        | 105        | 51,98%         | 51,98%         | 79,21%       |
| 900–1500 €         | 42         | 20,79%         | 20,79%         | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 11 Monthly net income

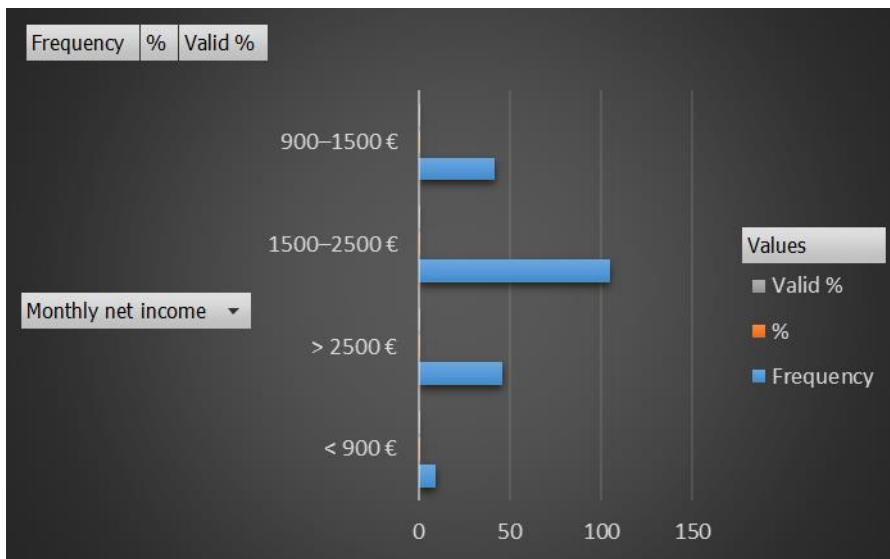


Figure 17 Monthly net income

Monthly net income replies indicate a sample that falls within the middle to upper income categories. Most of the replies indicate a monthly net income between €1,500 and €2,500 (105 respondents) and then it follows the more than €2,500 replies (46 respondents). Lower income groups are less represented, with 42 respondents earning between €900 and €1,500 and only 9 respondents reporting an income below €900. This indicates a financially stable sample.

## 5. Place of residence

| Place of residence | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| Rural              | 12         | 5,94%          | 5,94%          | 5,94%        |
| Semi-urban         | 29         | 14,36%         | 14,36%         | 20,30%       |
| Urban              | 161        | 79,70%         | 79,70%         | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 12 Place of residence

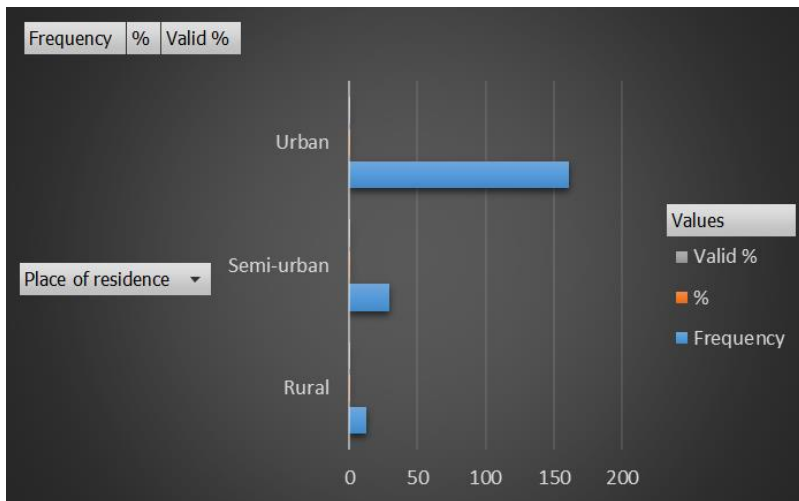


Figure 18 Place of residence

The place of residence distribution reveals a strong dominance of urban respondents, with the vast majority living in urban areas (161 respondents), followed by Semi-urban areas (29 respondents). Rural residents are represented with only 12 responses. This indicates that the results represent the consumers' perspective in an urban area where the access to sustainability labeled products is higher.

## Section B – Purchasing habits

### 6. How often do you buy food products from supermarkets or grocery stores?

Table 13 Purchase habits

| How often do you buy food products from supermarkets or grocery stores | Frequency  | %              | Valid %        | Cumulative % |
|------------------------------------------------------------------------|------------|----------------|----------------|--------------|
| 2 - 3 times per week                                                   | 138        | 68,32%         | 68,32%         | 68,32%       |
| Daily                                                                  | 15         | 7,43%          | 7,43%          | 75,74%       |
| once per week                                                          | 46         | 22,77%         | 22,77%         | 98,51%       |
| Rarely                                                                 | 3          | 1,49%          | 1,49%          | 100,00%      |
| <b>Grand Total</b>                                                     | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

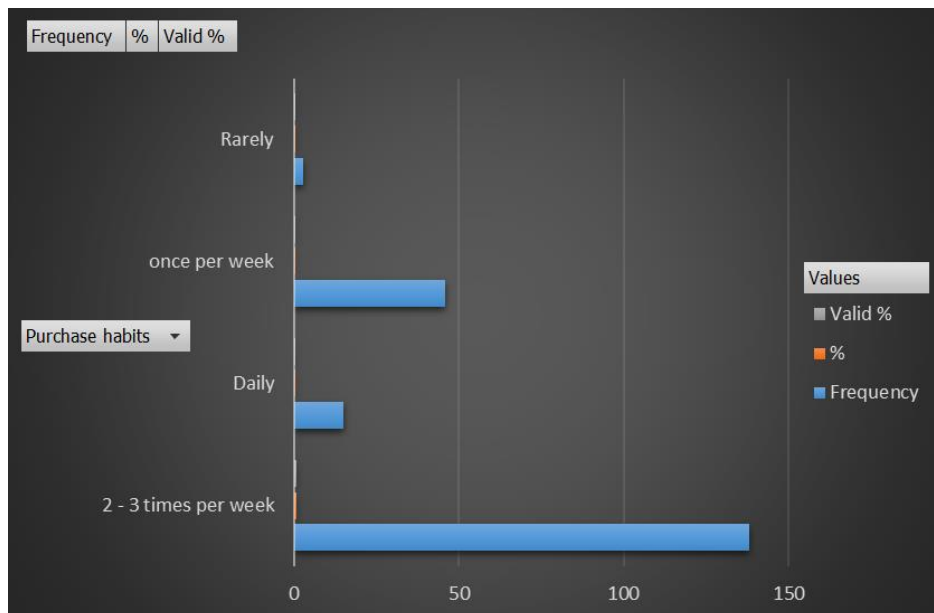


Figure 19 Purchase habits

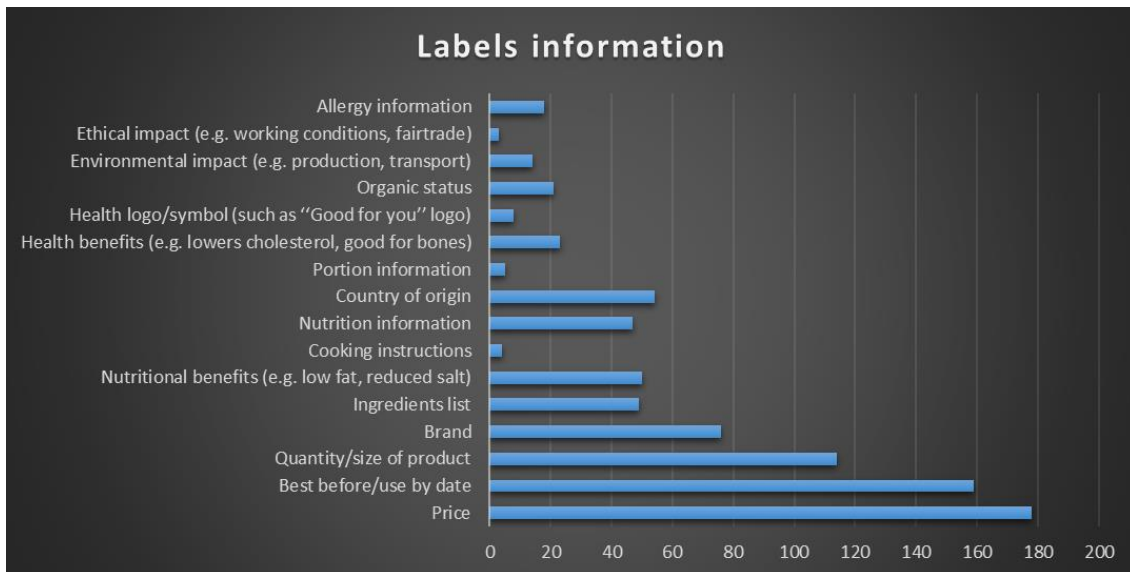
The results indicate that the majority of respondents purchase food products from supermarkets or grocery stores on a frequent basis. Most participants replied shopping 2 to 3 times per week (138 respondents), followed by once per week (46 respondents). A smaller proportion of consumers shop daily (15 respondents) and very few report purchasing food products rarely (3 respondents). This distribution suggests that the sample consists of regular food shoppers with continuous exposure to food purchasing decisions.

Although this question, along with the following one, is not directly linked to the study's research questions, it provides essential contextual information on consumers' purchasing habits.

**7. When buying food and drink products, how often do you look for the following information on the packaging?**

| <b>Labels information</b>                                 | <b>Frequency</b> | <b>%</b>       | <b>Valid %</b> | <b>Cumulative %</b> |
|-----------------------------------------------------------|------------------|----------------|----------------|---------------------|
| Price                                                     | 178              | 21,63%         | 21,63%         | 21,63%              |
| Best before/use by date                                   | 159              | 19,32%         | 19,32%         | 40,95%              |
| Quantity/size of product                                  | 114              | 13,85%         | 13,85%         | 54,80%              |
| Brand                                                     | 76               | 9,23%          | 9,23%          | 64,03%              |
| Ingredients list                                          | 49               | 5,95%          | 5,95%          | 69,99%              |
| Nutritional benefits (e.g. low fat, reduced salt)         | 50               | 6,08%          | 6,08%          | 76,06%              |
| Cooking instructions                                      | 4                | 0,49%          | 0,49%          | 76,55%              |
| Nutrition information                                     | 47               | 5,71%          | 5,71%          | 82,26%              |
| Country of origin                                         | 54               | 6,56%          | 6,56%          | 88,82%              |
| Portion information                                       | 5                | 0,61%          | 0,61%          | 89,43%              |
| Health benefits (e.g. lowers cholesterol, good for bones) | 23               | 2,79%          | 2,79%          | 92,22%              |
| Health logo/symbol (such as “Good for you” logo)          | 8                | 0,97%          | 0,97%          | 93,20%              |
| Organic status                                            | 21               | 2,55%          | 2,55%          | 95,75%              |
| Environmental impact (e.g. production, transport)         | 14               | 1,70%          | 1,70%          | 97,45%              |
| Ethical impact (e.g. working conditions, fairtrade)       | 3                | 0,36%          | 0,36%          | 97,81%              |
| Allergy information                                       | 18               | 2,19%          | 2,19%          | 100,00%             |
| <b>Grand Total</b>                                        | <b>823</b>       | <b>100,00%</b> | <b>100,00%</b> |                     |

**Table 14 Labels information**



**Figure 20 Labels information**

The findings indicate that consumers focus on basic and functional information when purchasing food and drink products. Price is the most frequent reply (178 respondents), followed by best before/use by date (159) and quantity or size of the product (114). Brand also plays a significant role (76 respondents). On the other hand, information related to health, nutrition, and sustainability is consulted significantly less often.

## 8. How important is sustainability in your food purchasing decisions?

| Sustainability importance | Frequency  | %              | Valid %        | Cumulative % |
|---------------------------|------------|----------------|----------------|--------------|
| Extremely                 | 4          | 1,98%          | 1,99%          | 1,99%        |
| Moderately                | 105        | 51,98%         | 52,24%         | 54,23%       |
| Not at all                | 11         | 5,45%          | 5,47%          | 59,70%       |
| Slightly                  | 46         | 22,77%         | 22,89%         | 82,59%       |
| Very                      | 35         | 17,33%         | 17,41%         | 100,00%      |
| (blank)                   | 1          | 0,50%          | -              | -            |
| <b>Grand Total</b>        | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 15 Importance of sustainability labels

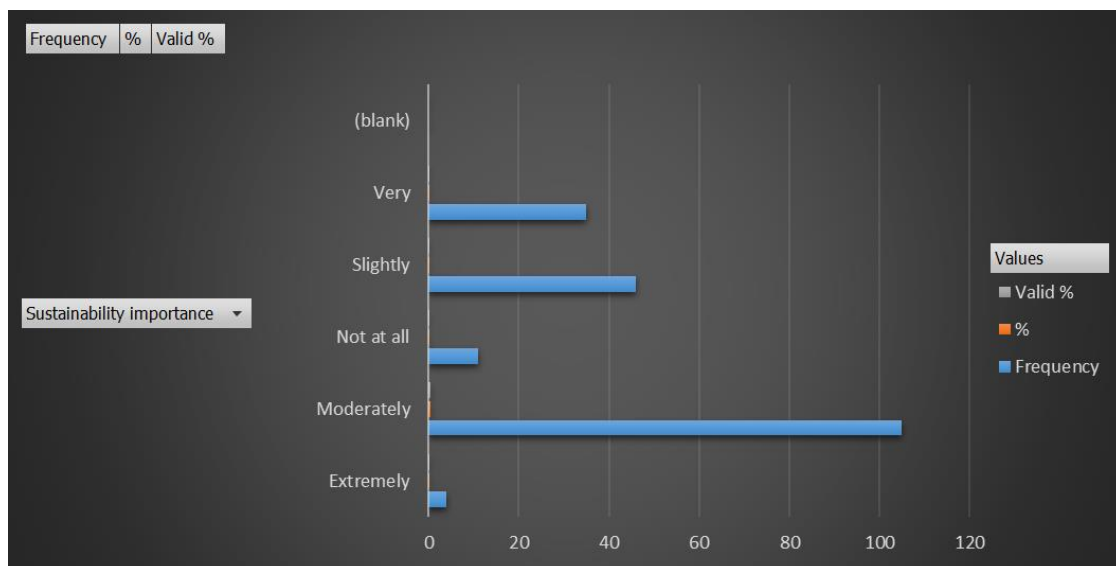


Figure 21 Sustainability labels importance

The majority of respondents consider sustainability as moderately important (105 respondents), followed by those who consider it slightly important (46) or very important (35). A small proportion of respondents view sustainability as extremely important (4), and 11 respondents suggest that it is not important at all. The results indicate that sustainability plays a relevant, but not dominant, role in consumers' food purchasing decisions and that it acts as a secondary decision-making factor.

Overall, Section B provides valuable insights into consumer's food purchasing habits and decision-making priorities. While price and practical information remain the main factors for the final decision, sustainability is considered as moderately important by most consumers. These findings indicate the existence of an intention-behavior gap, suggesting that positive attitudes toward sustainability do not always mean that customers will proceed to a purchase. Section C focuses on consumer's awareness, understanding, and

trust in sustainability labels, aiming to examine whether these factors can enhance the role of sustainability in actual purchasing decisions and directly address the research questions:

- RQ1** To what extent do Greek consumers recognize and understand sustainability labels on food products?
- RQ2** How much do consumers trust sustainability labels related to environmental and ethical food production?
- RQ3** Does the level of understanding and trust in sustainability labels influence consumers' purchasing decisions?

## Section C – Understanding of Sustainability Labels

### 9. Have you noticed the “Carbon Trust” label?



Figure 22 Carbon trust label

| Carbon Trust       | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| No                 | 94         | 46,53%         | 46,53%         | 46,53%       |
| Not sure           | 29         | 14,36%         | 14,36%         | 60,89%       |
| Yes                | 79         | 39,11%         | 39,11%         | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 16 Carbon Trust label awareness

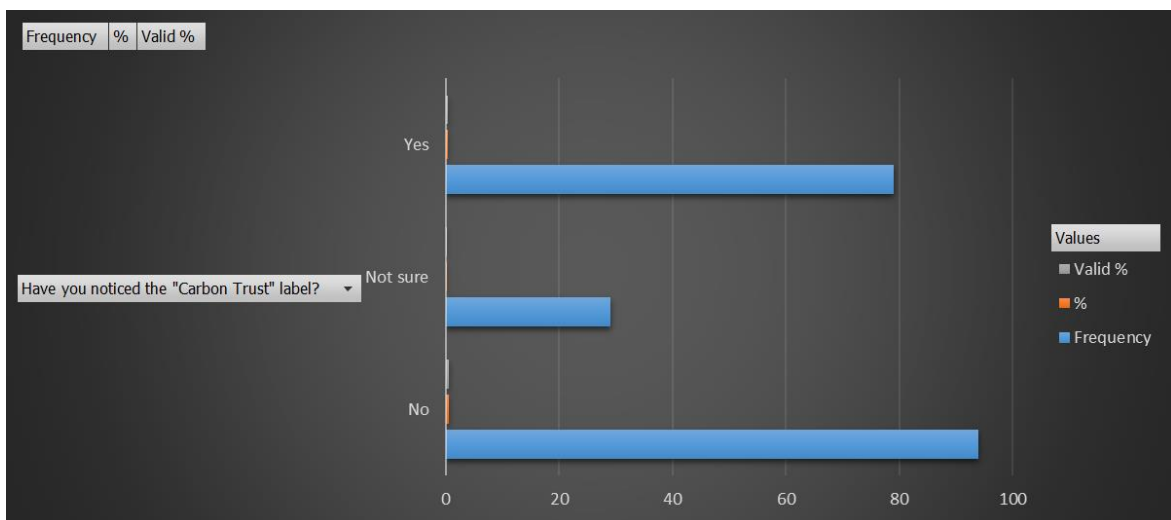


Figure 23 Carbon Trust label awareness

The results reveal a low level of consumer recognition of the “Carbon Trust” label. Less than half of the respondents report having noticed the label (79 respondents), while the majority of the consumers replied that they have not noticed it (94 respondents) or are unsure (29 respondents). This distribution suggests limited visibility and/or limited consumer familiarity with this label within the Greek food market.

## 10. Have you noticed the “GMO Free” label?



Figure 24 GMO Free label

| GMO Free           | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| No                 | 42         | 20,79%         | 20,79%         | 20,79%       |
| Not sure           | 14         | 6,93%          | 6,93%          | 27,72%       |
| Yes                | 146        | 72,28%         | 72,28%         | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 17 GMO Free label awareness

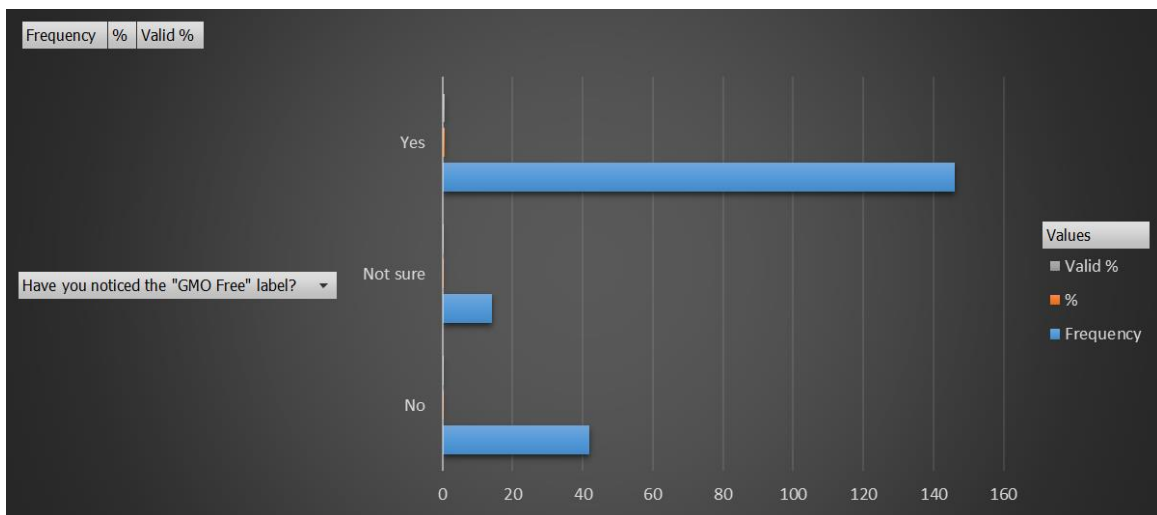


Figure 25 GMO Free label awareness

The findings indicate a high level of consumer recognition of the “GMO Free” label. A clear majority of respondents report having noticed the label (146 respondents), while relatively few indicate that they have not noticed it (42) or are unsure (14). This suggests that the “GMO Free” label is significantly more visible and familiar to Greek consumers compared to other sustainability-related certifications. This label indicates that the food product is free from genetically modified ingredients. Therefore, consumers are more sensitive to it compared to labels such as “Carbon Trust”, which are related with sustainable production of the package.

## 11. Have you noticed the “BIOHELLAS” label?



Figure 26 BIOHELLAS label

| BIOHELLAS          | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| No                 | 25         | 12,38%         | 12,44%         | 12,44%       |
| Not sure           | 7          | 3,47%          | 3,48%          | 15,92%       |
| Yes                | 169        | 83,66%         | 84,08%         | 100,00%      |
| (blank)            | 1          | 0,50%          | -              | -            |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 18 BIOHELLAS label awareness

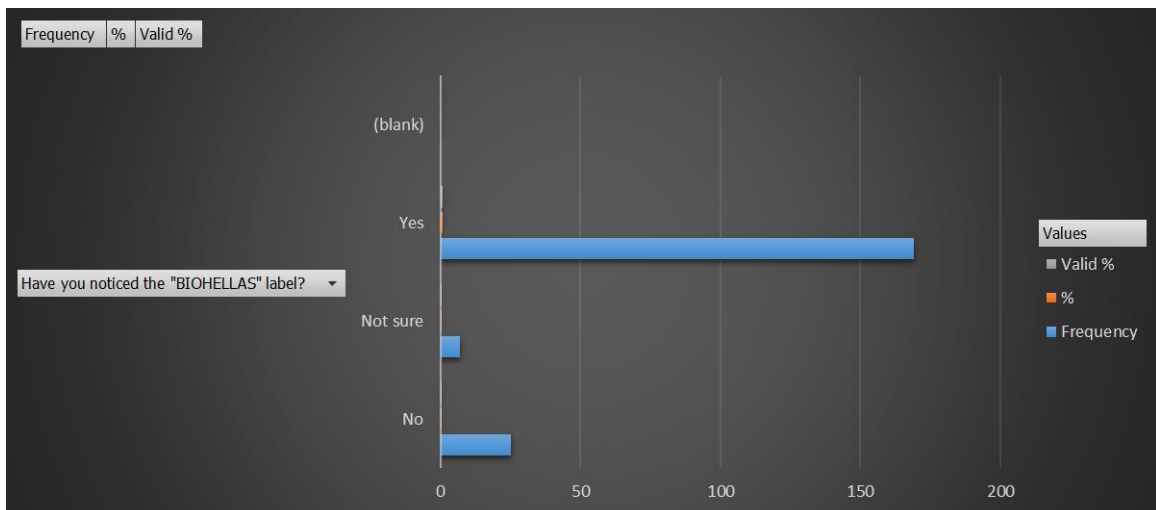


Figure 27 BIOHELLAS label awareness

The results indicate a very high level of consumer recognition of the “BIOHELLAS” label. The vast majority of respondents report having noticed the label (169 respondents), while only a small number indicate that they have not noticed it (25) or are unsure (7). This strong recognition can be explained by the fact that this label is in the Greek market many years and has built an institutional credibility within the Greek food market, mainly in relation to organic products. The low level of uncertainty suggests that consumers not only recognize the label visually but are also relatively confident in identifying its meaning.

## 12. Have you noticed the “Fair trade” label?



Figure 28 Fair trade logo

| Fair Trade         | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| No                 | 121        | 59,90%         | 59,90%         | 59,90%       |
| Not sure           | 26         | 12,87%         | 12,87%         | 72,77%       |
| Yes                | 55         | 27,23%         | 27,23%         | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 19 Fair trade label awareness

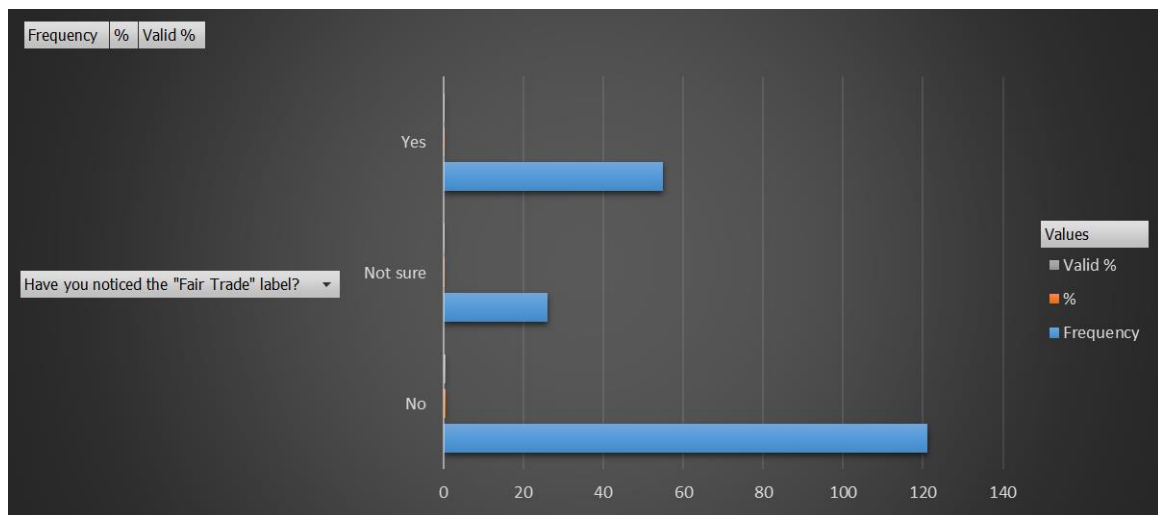


Figure 29 Fair trade label awareness

The results indicate a relatively low level of consumer recognition of the “Fair Trade” label. Most of the replies report that they have not noticed the label (121 respondents) and a smaller proportion indicate having noticed it (55 respondents) or being not sure (26). Despite the label’s international appearance, its recognition in the Greek market is low. This may be explained by the fact that the label’s presence in widely consumed products is limited.

### 13. How well do you understand the meaning of the "Carbon Trust" label?

| Carbon trust understanding | Frequency  | %              | Valid %        | Cumulative % |
|----------------------------|------------|----------------|----------------|--------------|
| Moderately                 | 57         | 28,22%         | 28,22%         | 28,22%       |
| Not at all                 | 25         | 12,38%         | 12,38%         | 40,59%       |
| Slightly                   | 37         | 18,32%         | 18,32%         | 58,91%       |
| Very well                  | 18         | 8,91%          | 8,91%          | 67,82%       |
| Well                       | 65         | 32,18%         | 32,18%         | 100,00%      |
| <b>Grand Total</b>         | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 20 Carbon trust label understanding

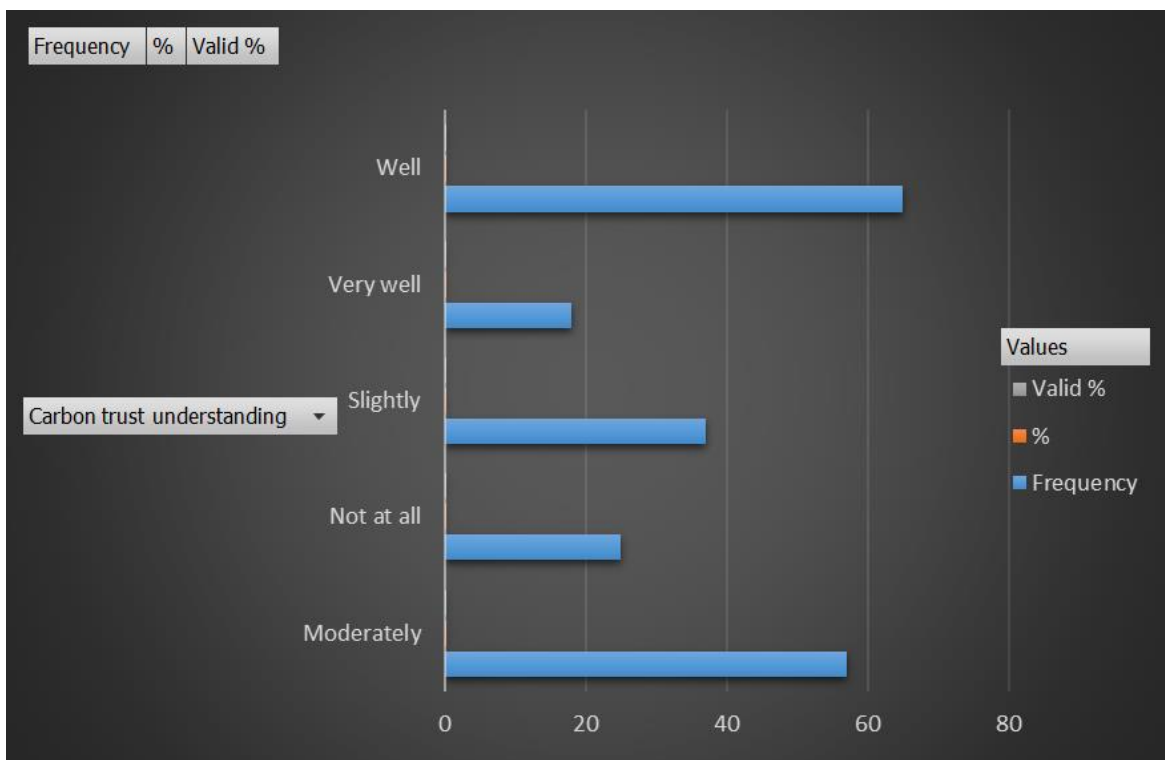


Figure 30 Carbon trust label understanding

The results indicate a moderate level of understanding of the “Carbon Trust” label between respondents. Most consumers report that they understand the label well (65 respondents), very well (18 respondents) or moderately (57 respondents). However, an important proportion of replies suggest limited understanding, with 37 reporting slight understanding and 25 indicating no understanding at all.

#### 14. How well do you understand the meaning of the "GMO Free" label?

| GMO Free understanding | Frequency  | %              | Valid %        | Cumulative % |
|------------------------|------------|----------------|----------------|--------------|
| Moderately             | 32         | 15,84%         | 15,84%         | 15,84%       |
| Not at all             | 38         | 18,81%         | 18,81%         | 34,65%       |
| Slightly               | 17         | 8,42%          | 8,42%          | 43,07%       |
| Very well              | 19         | 9,41%          | 9,41%          | 52,48%       |
| Well                   | 96         | 47,52%         | 47,52%         | 100,00%      |
| <b>Grand Total</b>     | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 21 GMO Free label understanding

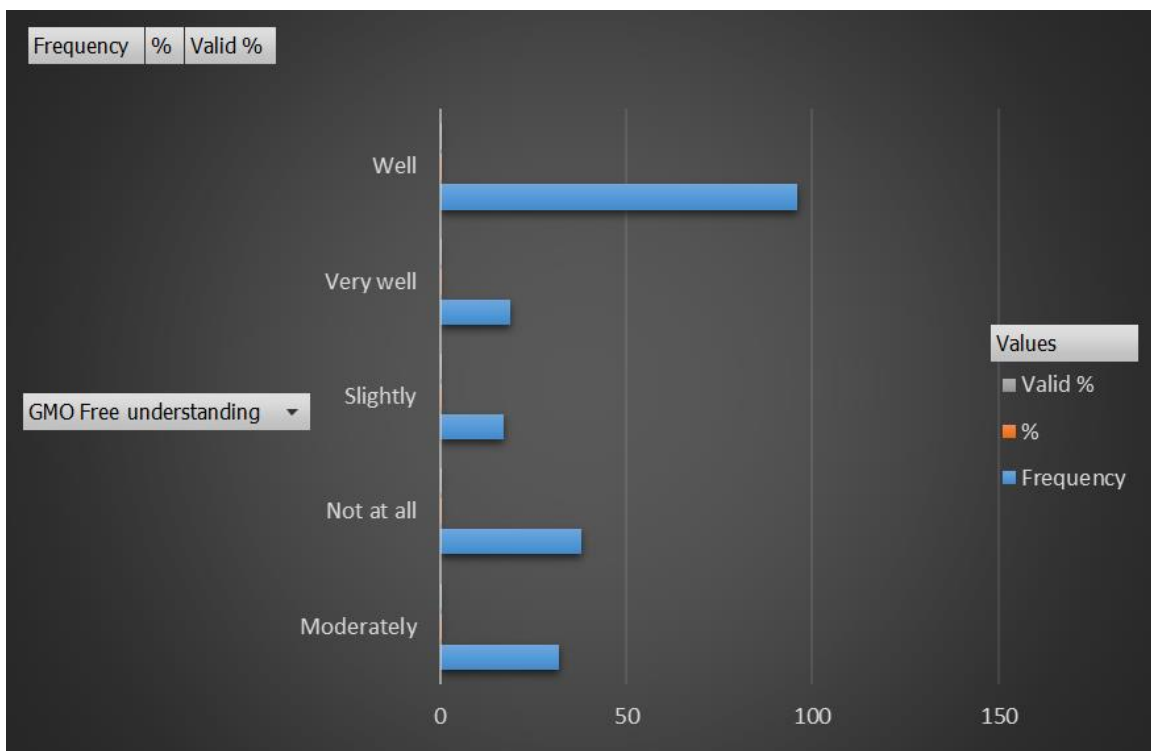


Figure 31 GMO Free label understanding

Most of the consumers replied that the label is well understand (96 respondents) or very well (19 respondents). A smaller sample replied a moderate understanding (32 respondents) and a smaller proportion of the sample replied limited or no understanding (17 slightly and 38 not at all). The findings indicate that the meaning of the “GMO Free” label is clear and easily interpretable for most consumers.

### 15. How well do you understand the meaning of the "BIOHELLAS" label?

| BIOHELLAS understanding | Frequency  | %              | Valid %        | Cumulative % |
|-------------------------|------------|----------------|----------------|--------------|
| Moderately              | 38         | 18,81%         | 18,81%         | 18,81%       |
| Not at all              | 14         | 6,93%          | 6,93%          | 25,74%       |
| Slightly                | 28         | 13,86%         | 13,86%         | 39,60%       |
| Very well               | 31         | 15,35%         | 15,35%         | 54,95%       |
| Well                    | 91         | 45,05%         | 45,05%         | 100,00%      |
| <b>Grand Total</b>      | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 22 BIOHELLAS label understanding

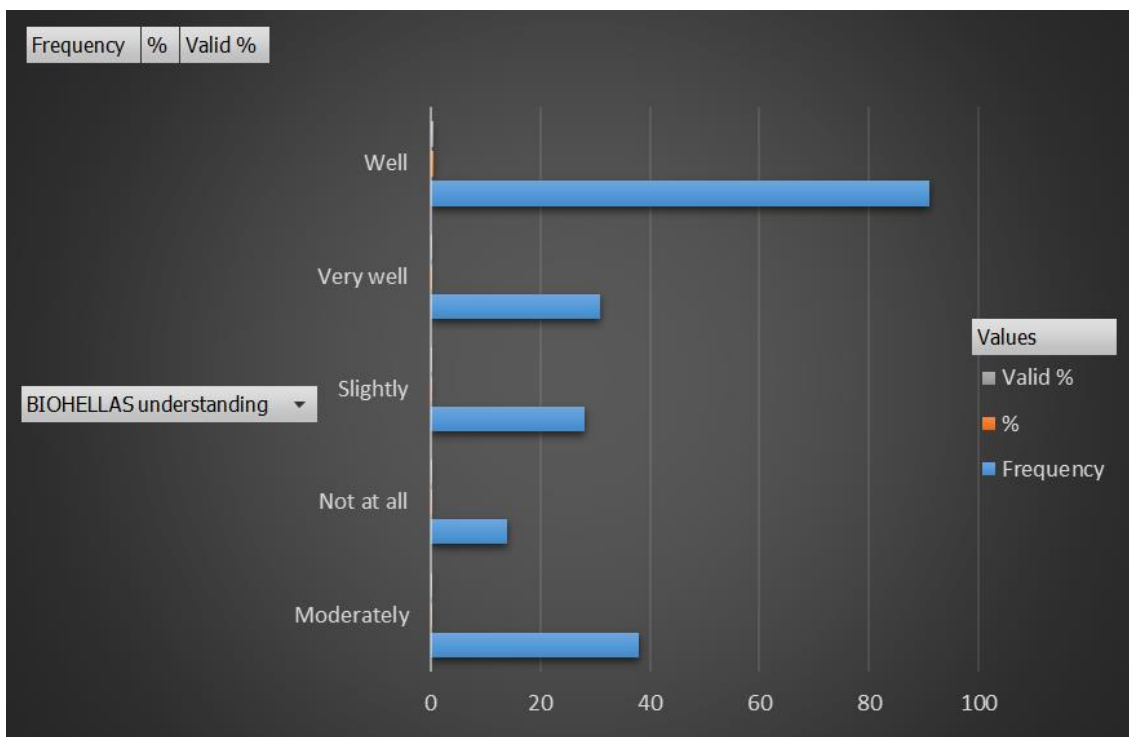


Figure 32 BIOHELLAS label understanding

Similar to the “GMO Free” label, the results of the “BIOHELLAS” label indicate a high level of consumer understanding, suggesting that the meaning of the “BIOHELLAS” label is clear to the majority of consumers. Most respondents report understanding the label well and very well (91 and 31 respondents). A smaller proportion indicate moderate understanding (38) and a very limited number of replies report slight (28) or no understanding at all (14).

## 16. How well do you understand the meaning of the "Fair Trade" label?

| Fairtrade understanding | Frequency  | %              | Valid %        | Cumulative % |
|-------------------------|------------|----------------|----------------|--------------|
| Moderately              | 40         | 19,80%         | 19,80%         | 19,80%       |
| Not at all              | 67         | 33,17%         | 33,17%         | 52,97%       |
| Slightly                | 43         | 21,29%         | 21,29%         | 74,26%       |
| Very well               | 12         | 5,94%          | 5,94%          | 80,20%       |
| Well                    | 40         | 19,80%         | 19,80%         | 100,00%      |
| <b>Grand Total</b>      | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 23 Fairtrade label understanding

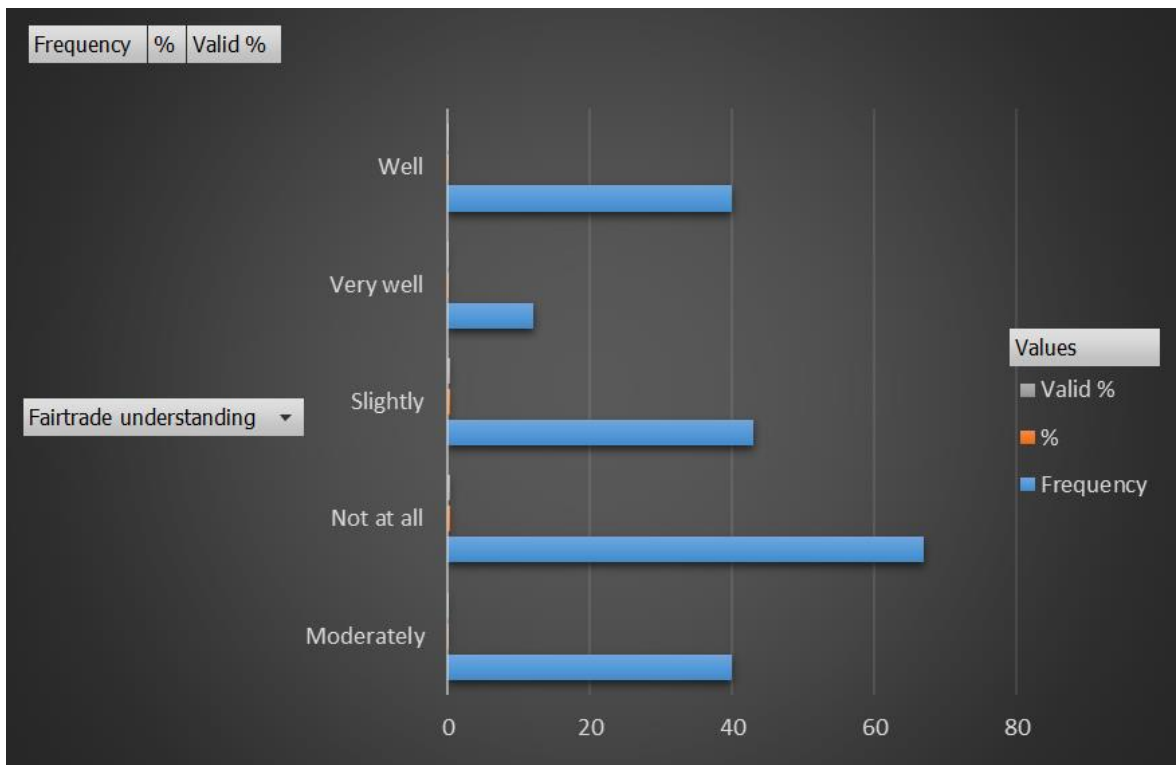


Figure 33 Fairtrade label understanding

The level of understanding of the “Fair trade” label is low. Most of the replies are Not at all or slightly. The label has a strong ethical orientation and international recognition but its presence in the Greek market is limited, hence it is not clearly understood from Greek consumers.

In relation to the first research question number 1 (**RQ1**): *To what extent do Greek consumers recognize and understand sustainability labels on food products?* the above findings are summarized in the paragraph below:

#### **“Carbon Trust” label**

The awareness findings indicate that the majority of the Greek consumers are not aware of the “Carbon Trust” Label. These results highlight a gap between the increasing availability of sustainability certification and consumer’s ability to recognize them. On the other hand, the level of understanding of this label is relatively high, as 83 responses were “well” and “very well”. This suggests that the “Carbon Trust” message is clear and easy for customer to understand. However, a clear message and a good level of understanding do not guarantee that consumers will recognize the label or actively seek it. For labels that are not directly related to ingredients or pricing, consumers education is important in order to influence the purchasing decisions.

#### **“GMO Free” label**

The “GMO free” label demonstrates a very high level of awareness among Greek consumers. While the more technical labels, such as the “Carbon Trust”, show limited recognition, the more straightforward and directly connected with the product ingredients “GMO free” label achieves higher awareness. This is consistent with the findings on understanding, where the “GMO-free” label also scores highly. Labels that are directly related to product attributes—such as ingredients or price—and have an immediate impact on consumers are generally easier to understand and more likely to be recognized than labels referring to indirect or secondary characteristics, such as sustainable packaging.

#### **“BIO Hellas – Euro leaf” label**

The findings for the “BIO Hellas” label confirm that this label is one of the most recognizable labels in the Greek market. The long-term market presence and the clarity of its message facilitate both the recognition and the understanding. The level of understanding is particularly high among Greek consumers, since 122 responses were “well” and “very well”. This further support confirms the argument that the directly related to product attributes labels have an immediate impact on consumers. The “BIO Hellas” label is well established in the Greek consumers perception as a label that certifies that the product is produced using sustainable and organic methods.

#### **“Fair Trade” label**

While the product-related labels such as “BIO Hellas” or “GMO Free” demonstrate high recognition, the “Fair Trade” label which is more ethically oriented, show a low awareness. The limited presence of the “Fair Trade” label in widely consumed products may explain these findings, as it is mainly found in imported products such as coffee, cocoa, and tea. The level of understanding is also low, which can be attributed to the abstract nature of

the message, as well as to Greek consumer’s limited familiarity with such labels and certifications.

The following table summarizes the level of awareness and the level of understanding for each label, in order to build a map of the presence of these labels in the Greek market:

| Sustainability Label                                                                                                                                                                                                  | Awareness | Understanding |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------|
| <b>Carbon Trust</b><br>                                                                                                              | Low       | Medium        |
| <b>BIO Hellas – EU Organic (“Euro-leaf”)</b><br>  | High      | High          |
| <b>GMO Free</b><br>                                                                                                                | High      | High          |
| <b>Fair Trade</b><br>                                                                                                              | Low       | Low           |

**Table 24 Awareness and Understanding of labels**

The following questions 17 and 18 are directly related to the research question no 2 (RQ2): *How much do consumers trust sustainability labels related to environmental and ethical food production?*

In order to further evaluate if the “Trust” is dependent of some specific demographic’s variables, chi-square analysis was performed. The examined variables are the Education level, the Age and the Place of residence. All statistical tests were conducted at a 5% level of significance ( $\alpha = 0.05$ ).

### 17. How much do you trust the information provided by these labels?

| Labels trust       | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| Moderately         | 75         | 37,13%         | 37,50%         | 37,50%       |
| Not at all         | 10         | 4,95%          | 5,00%          | 42,50%       |
| Slightly           | 21         | 10,40%         | 10,50%         | 53,00%       |
| Very well          | 6          | 2,97%          | 3,00%          | 56,00%       |
| Well               | 88         | 43,56%         | 44,00%         | 100,00%      |
| (blank)            | 2          | 0,99%          | -              | -            |
| <b>Grand Total</b> | <b>200</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 25 Labels trust

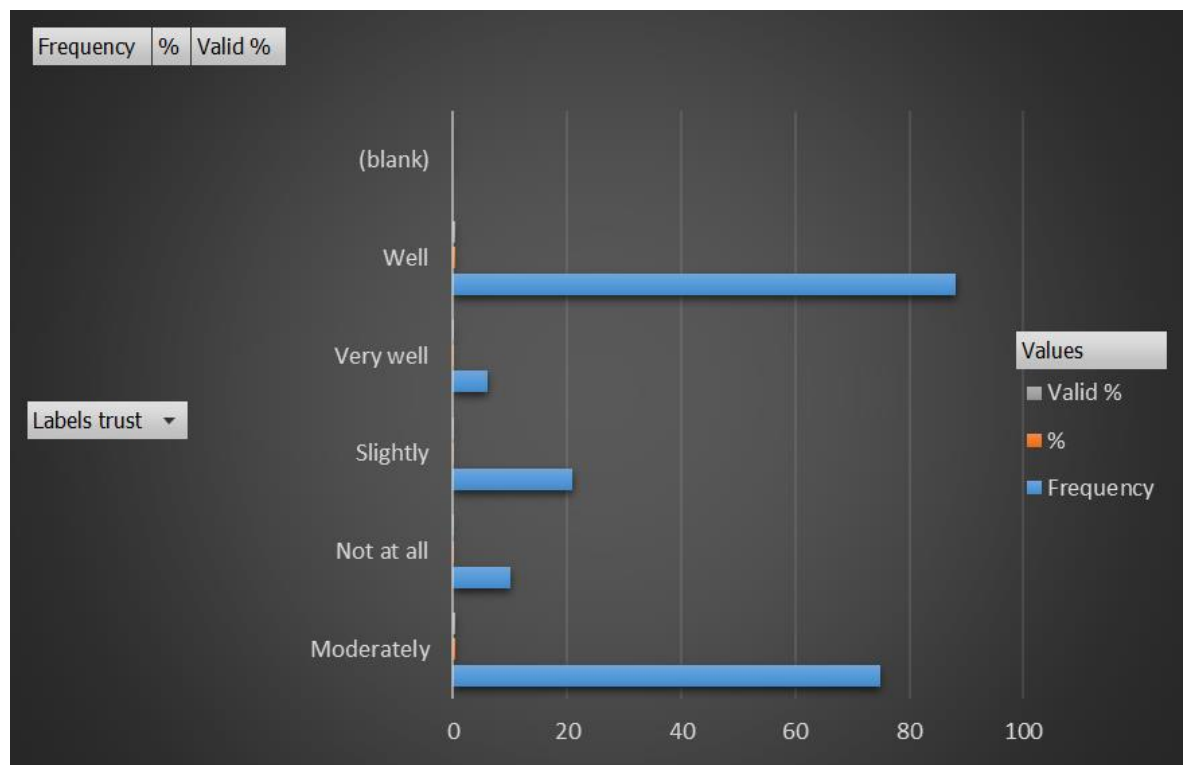


Figure 34 Labels trust

The data indicate a moderate to well trust in sustainability labels among the consumers. The majority of the replies are “Well” (88) and “Moderately” (75), there is also

a limited number of respondents (6) that trust the sustainable “Very well”, increasing the total amount of “Moderately, Well and Very well” to 169. Approximately the 83% of the replies indicate a moderate to well trust level, consumers tend to view the sustainability labels as reasonably credible.

### 18. Do you believe that these labels accurately reflect the sustainability or safety of the product?

| Labels trust       | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| No                 | 23         | 11,39%         | 11,39%         | 11,39%       |
| Not sure           | 82         | 40,59%         | 40,59%         | 51,98%       |
| Yes                | 97         | 48,02%         | 48,02%         | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 26 Labels reflection of the sustainability or safety of the product

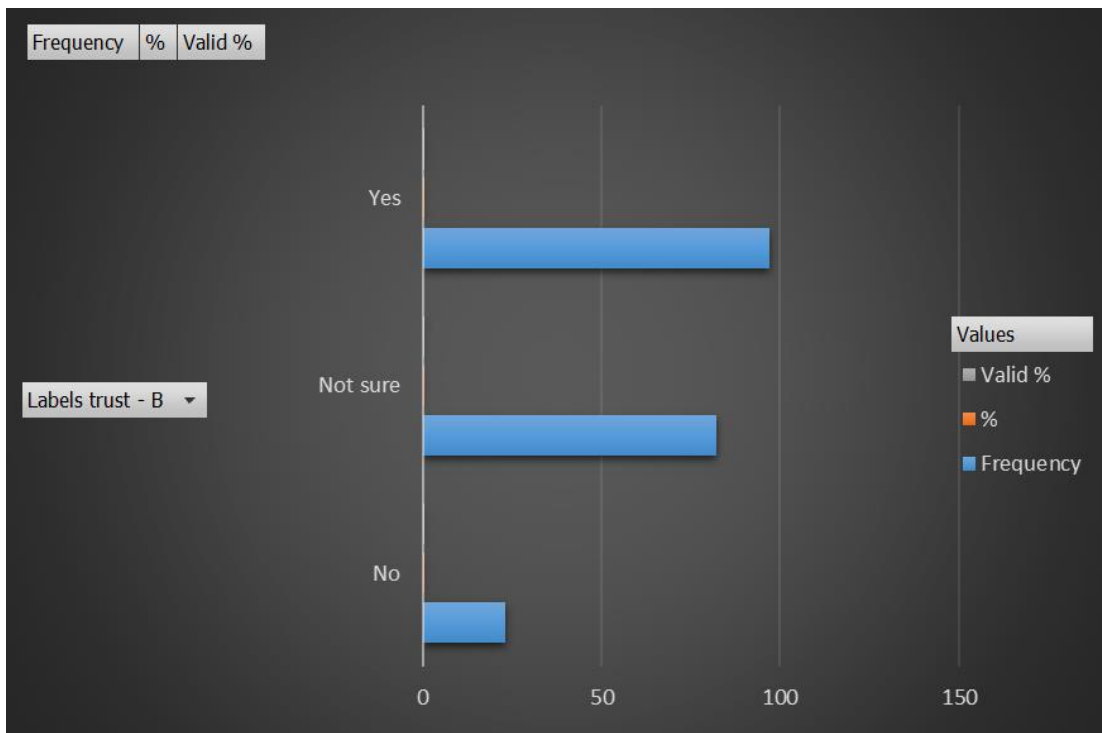


Figure 35 Labels reflection of the sustainability or safety of the product

The results indicate a positive perception regarding the accuracy of sustainability and safety labels on food products. When asked if these labels are accurately reflecting the sustainability safety of the product, nearly half of the respondents believe that these labels accurately reflect the sustainability or safety of the product (97 respondents), while a considerable proportion remain uncertain (82). A smaller group replied negatively, stating that the labels do not accurately reflect product sustainability or safety (23). This distribution suggests that although trust in sustainability labels exists, it is not absolute and is often accompanied by uncertainty.

## Chi-square analysis – $\chi^2$

Chi-square analysis is adopted to examine if there is any relation between the demographics and the level of trust. However, it is important to mention that in the expected frequencies table more than 20% of the cells had frequencies less than five (5). Hence the results may be unreliable. A larger and more evenly distributed sample is suggested for future research.

### 1. Education level and trust

A chi-square test of independence was conducted to examine the relationship between respondents' education level and their level of trust in sustainability labels:

- Chi-square ( $\chi^2$ ) = 32.942
- Degrees of freedom (df) = 12
- p-value = 0.0042
- Cramers V = 0.234, small association

The results indicate a statistically significant association between the two variables, since the p-value is lower than the significance level ( $\alpha = 0.05$ ).

These results provide indicative evidence regarding RQ2, suggesting that **“Trust” is dependent of the “Education level” variable.**

### 2. Age and trust

A chi-square test of independence was conducted to examine the relationship between respondents' age and their level of trust in sustainability labels:

- Chi-square ( $\chi^2$ ) = 10.330
- Degrees of freedom (df) = 16
- p-value = 0.6651
- Cramers V = 0.114, small association

The results indicate that there is **no statistically** significant association between age and trust in sustainability labels, as the p-value is substantially higher than the conventional significance level ( $\alpha = 0.05$ ).

These results provide indicative evidence regarding RQ2, suggesting that **“Trust” is independent of the “Age” variable.**

### 3. Place of residence and trust

A chi-square test of independence was applied to examine the relationship between place of residence and trust in sustainability labels related to environmental and ethical food production.

- Chi-square ( $\chi^2$ ) = 13.529
- Degrees of freedom (df) = 8
- p-value = 0.0949
- Cramers V = 0.184, small association

The results indicate that there is **no statistically** significant association between age and trust in sustainability labels, as the p-value is substantially higher than the conventional significance level ( $\alpha = 0.05$ ).

These results provide indicative evidence regarding RQ2, suggesting that **“Trust” is independent of the “Place of residence” variable.**

#### Composite Index creation

In the following chapters, purchase behavior and willingness to pay are presented. Following the presentation of the data, various statistical models are employed to analyze the data and investigate how awareness and understanding of the sustainability labels influence consumer’s purchasing decisions. In order to develop a more robust regression model, a composite index creation approach was adopted. Responses from the relevant sections were aggregated into the following indexes:

| Questions      | Index         | Cronbach’s Alpha | Questions used |
|----------------|---------------|------------------|----------------|
| 09, 10, 11, 12 | Awareness     | 0.620            | 09, 10, 11, 12 |
| Questions      | Index         | Cronbach’s Alpha | Questions used |
| 13, 14, 15, 16 | Understanding | 0.697            | 13, 14, 15, 16 |
| Questions      | Index         | Cronbach’s Alpha | Questions used |
| 17, 18         | Trust         | 0.824            | 17, 18         |

Cronbach’s Alpha values for the Understanding and Trust index are above or marginally close to the commonly accepted threshold of 0.7, hence there is good/acceptable reliability among the data.

## Section D – Purchasing Behavior & Willingness to Pay

Questions 19 to 22 can be linked directly with the research question no 4 (**RQ4**): *Are Greek consumers willing to pay a price premium for food products carrying sustainability labels?*

Further to the above research question it a statistical analysis is adopted, using the tools described in the previous chapters to examine the relationship between understanding, awareness, trust and demographics with the willingness to pay and the purchase decisions. By the completion of this analysis the study gives feedback to the rest research questions:

Research question no 3 (**RQ3**): *Does the level of understanding and trust in sustainability labels influence consumers’ purchasing decisions?*

Research question no 5 (**RQ5**): *How do demographic factors (such as income, education, and age) affect consumers’ understanding of sustainability labels and their willingness to pay more for sustainable food products?*

### 19. Have you ever purchased a product specifically because of its sustainability label?

| Purchase of sustainability label | Frequency  | %              | Valid %        | Cumulative % |
|----------------------------------|------------|----------------|----------------|--------------|
| No                               | 132        | 65,35%         | 65,67%         | 65,67%       |
| Yes                              | 69         | 34,16%         | 34,33%         | 100,00%      |
| (blank)                          | 1          | 0,50%          | -              | -            |
| <b>Grand Total</b>               | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 27 Purchase of sustainability label

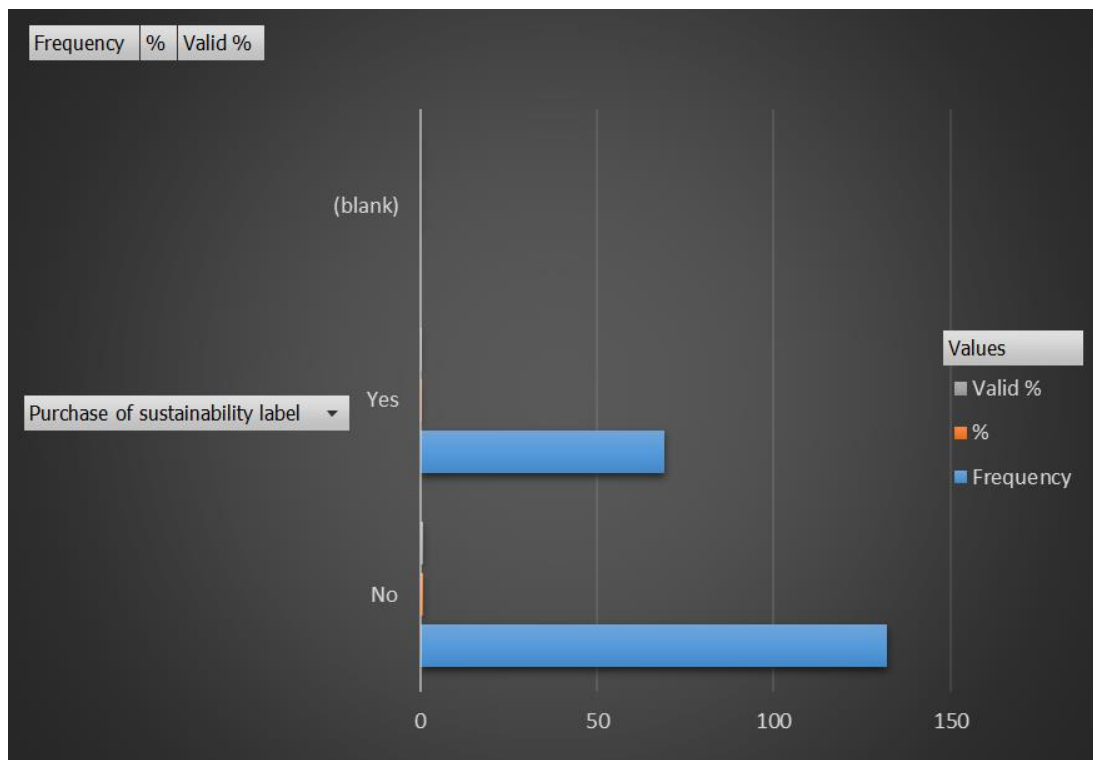


Figure 36 Purchase of sustainability label

The findings indicate that sustainability labels have a limited direct influence on consumers' purchasing decisions. The majority of the responses indicates that they have not purchased a product specifically because of the sustainability label that may have in the package (132 respondents). A small but notable proportion reports that they have done so (69 respondents). These results suggest that consumer's purchase behavior is not affected from the sustainability labels, even if they may recognize them or understand them. This also indicates a gap between the environmental sensitivity that the consumers report and their final decision to purchase a product that is sustainable produced certified.

## 20. Would you be willing to pay more for a product with a sustainability label? (WTP)

| WTP                | Frequency  | %              | Valid %        | Cumulative % |
|--------------------|------------|----------------|----------------|--------------|
| >20%               | 5          | 2,48%          | 2,48%          | 2,48%        |
| 10–20%             | 7          | 3,47%          | 3,47%          | 5,94%        |
| 5–10%              | 33         | 16,34%         | 16,34%         | 22,28%       |
| No                 | 37         | 18,32%         | 18,32%         | 40,59%       |
| Yes, up to 5%      | 120        | 59,41%         | 59,41%         | 100,00%      |
| <b>Grand Total</b> | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 28 WTP

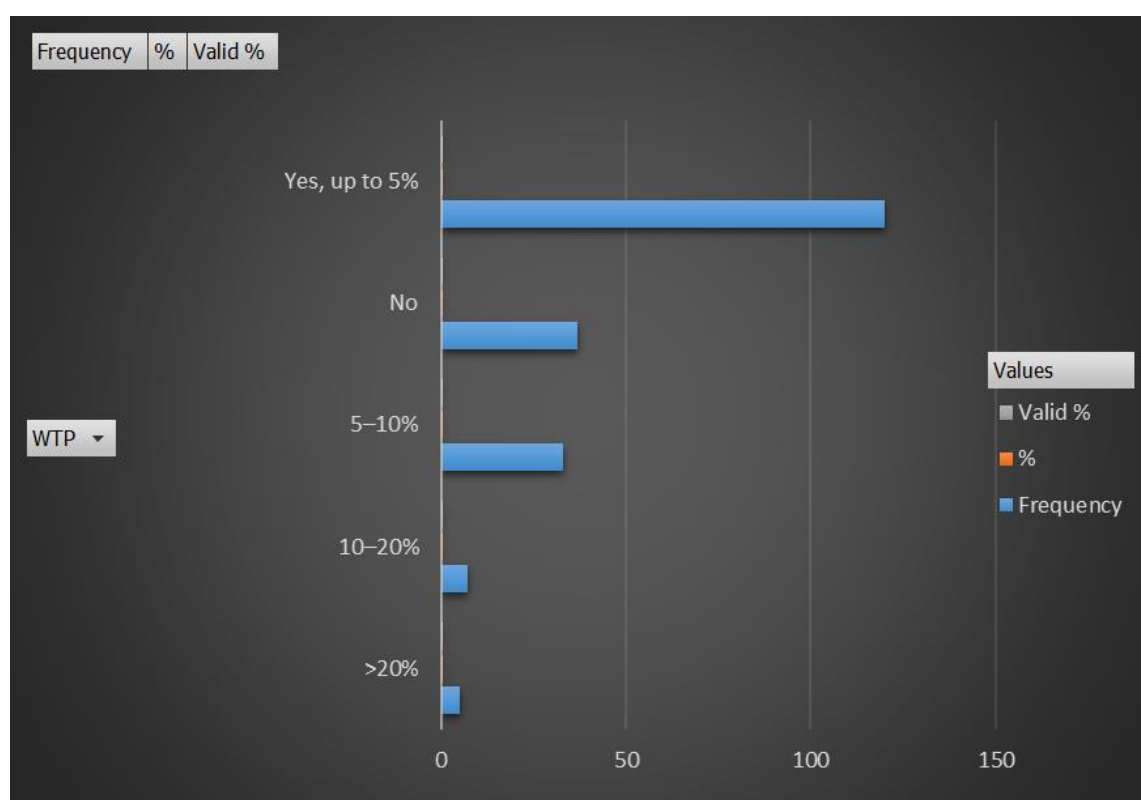


Figure 37 WTP

The results indicate a generally positive but limited willingness to pay a price premium for products carrying sustainability labels. The majority of respondents are willing to pay a small premium of up to 5% (120 respondents), while fewer participants indicate willingness to pay higher premiums of 5–10% (33), 10–20% (7), or more than 20% (5). An important part of the respondents is also reporting that they are not willing to pay any additional amount (37 respondents). These findings suggest that the price sensitivity for Greek consumers is high, however since the majority is willing to pay more up to 5%, there is also a sustainable and environmental sensitivity that must be further investigated.

**21. What level of price increase do you consider acceptable for a "Carbon Neutral", "GMO Free", "BIOHELLAS" or "Fair Trade" product compared to a conventional one?**

| Level of price Increase | Frequency  | %              | Valid %        | Cumulative % |
|-------------------------|------------|----------------|----------------|--------------|
| Moderate                | 36         | 17,82%         | 17,91%         | 17,91%       |
| None                    | 35         | 17,33%         | 17,41%         | 35,32%       |
| Small                   | 130        | 64,36%         | 64,68%         | 100,00%      |
| High                    | 0          | 0,00%          | 0,00%          | 100,00%      |
| (blank)                 | 1          | 0,50%          | -              | -            |
| <b>Grand Total</b>      | <b>201</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 29 Level of price increase

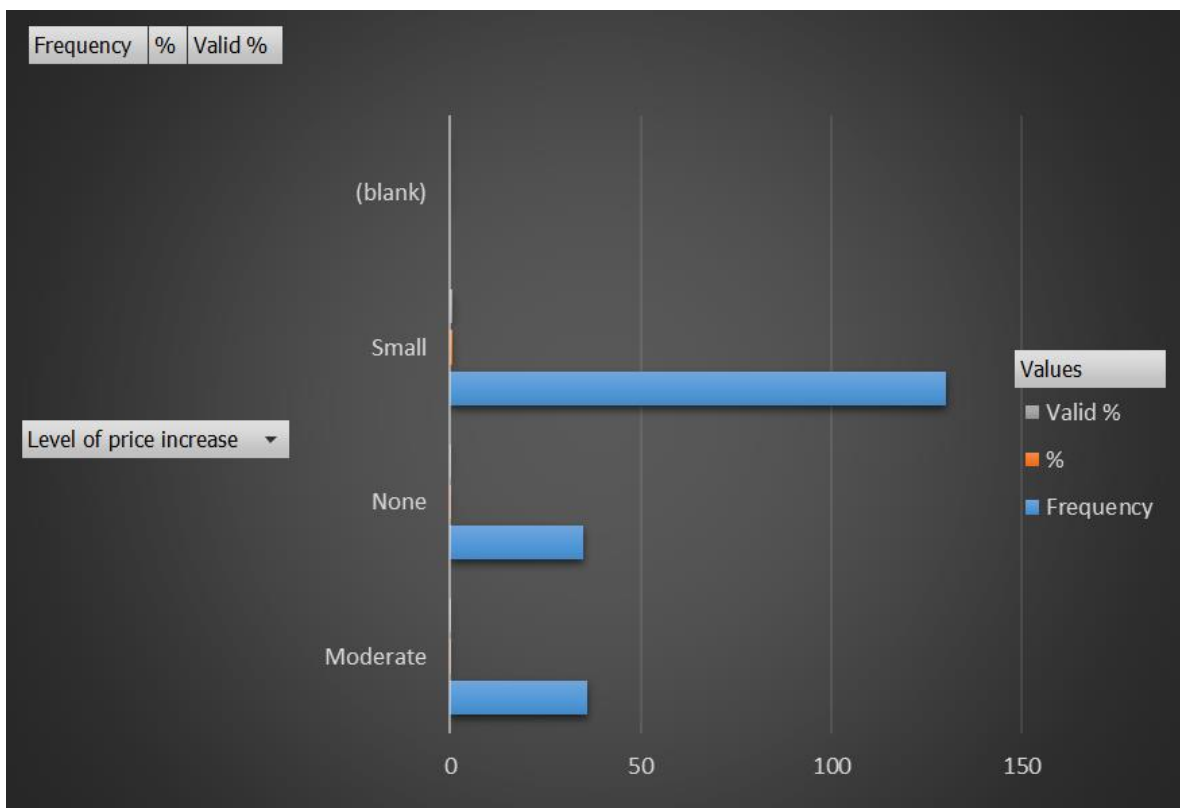


Figure 38 Level of price increase

The results of Question 21 indicate that Greek consumers show a generally cautious but positive stance toward paying a price premium for food products carrying sustainability labels. Most of the respondents (130 out of 201) stated that they consider only a small price increase acceptable and a smaller sample indicated acceptance of a moderate increase (36 respondents). On the other hand, a small proportion (35 replies) reported that no price increase would be acceptable. In relation to Research Question 4, these findings suggest that although Greek consumers show a willingness to pay a premium for sustainability-labelled products, this willingness is clearly limited in the minimum amount.

**22. If two products have the same price, how likely are you to choose the one with a sustainability label?**

| Choice of sustain. Label | Frequency  | %              | Valid %        | Cumulative % |
|--------------------------|------------|----------------|----------------|--------------|
| Likely                   | 68         | 33,66%         | 33,66%         | 33,66%       |
| Neutral                  | 65         | 32,18%         | 32,18%         | 65,84%       |
| Unlikely                 | 8          | 3,96%          | 3,96%          | 69,80%       |
| Very unlikely            | 6          | 2,97%          | 2,97%          | 72,77%       |
| Very likely              | 55         | 27,23%         | 27,23%         | 100,00%      |
| <b>Grand Total</b>       | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 30 Choose of sustainability label

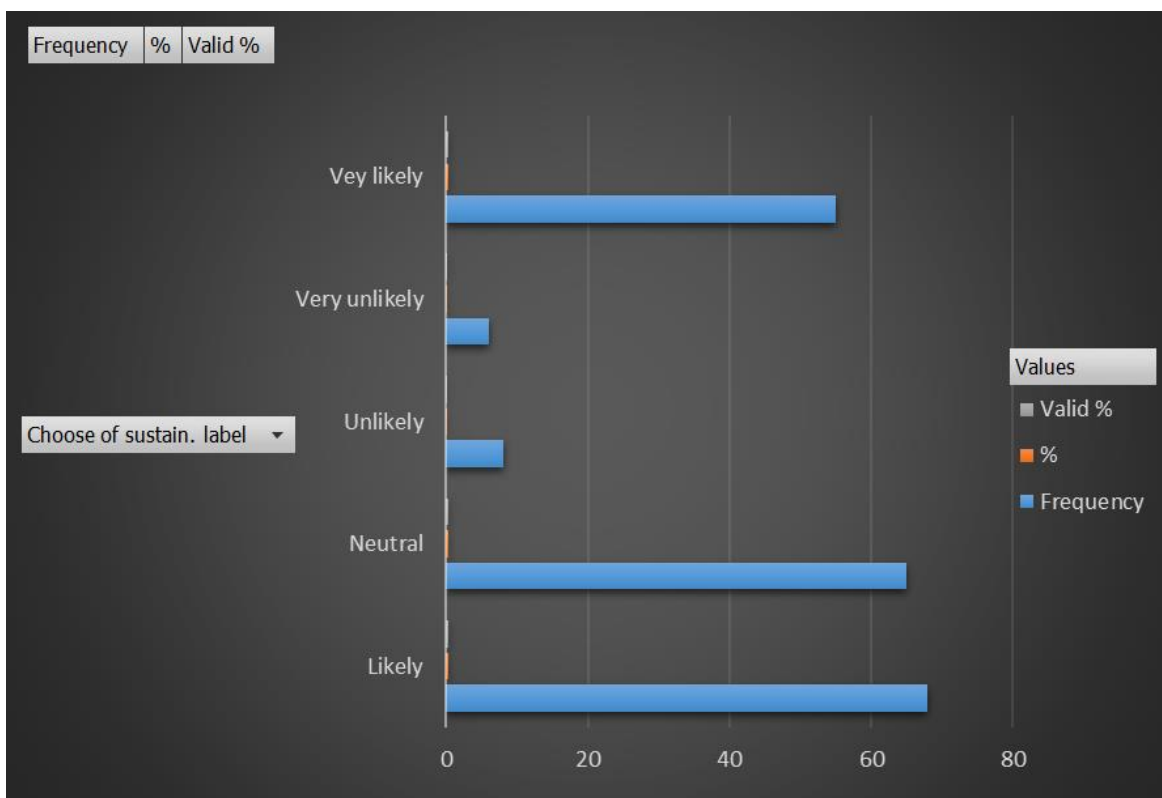


Figure 39 Choose of sustainability label

In Question 22 the majority of Greek consumers reported that they would choose a sustainability labeled product over a product not carrying such a label, when the price is kept constant (55 responses “Very likely” and 68 responses “Likely”). A comparable but smaller share expressed a neutral stance (65) and only a limited number of respondents reported being unlikely or very unlikely to select the labelled product. In relation to Research Question 4, these results suggest that sustainability labels influence positively purchasing decisions when no price premium is involved. This indicates that Greek consumers value sustainability attributes at a conceptual level; however, their willingness to act on this preference is strongly constrained by price considerations.

A presentation of the statistical methods that are applied to further examine and evaluate the willingness to pay (WTP) of Greek consumers follows to the next paragraphs. The research questions driving this analysis are the:

Research question no 3 (**RQ3**): *Does the level of understanding and trust in sustainability labels influence consumers’ purchasing decisions?*

Research question no 5 (**RQ5**): *How do demographic factors (such as income, education, and age) affect consumers’ understanding of sustainability labels and their willingness to pay more for sustainable food products?*

The statistical tools used for this study are:

- **Analysis of Variance (ANOVA)** to examine the influence of the sustainability labels on the purchasing decisions. Specifically, the analysis was applied between the WTP and the understanding of each label (Carbon Trust, GMO Free, BIO Hellas – Euro leaf, Fair Trade).
- **Multiple linear regression** as per below:  
$$\text{WTP} = \text{Trust} + \text{Understanding} + \text{Income} + \text{Education} + \text{Age}$$

The multiple linear regression shows which factor is mainly driving the WTP of the consumers and also examines if the demographics have an important role the consumers’ final decision
- **Logistic regression** allows to model the probability of behavior and gives a direct reply to the research questions number 3 and 4. The model is the following:  
$$\text{Purchase behavior (question 19)} = \text{Trust index} + \text{Understanding index} + \text{Income}.$$
- **Mediation analysis** to evaluate if the understanding index affects the willingness to pay mainly through the trust index.
- **Cluster Analysis (Consumer Segmentation)** to segment respondents into groups based on the trust, understanding, WTP and Sustainability importance.
- **Moderation Analysis (Interaction effect)** to examine the specific characteristics of the groups created in the cluster analysis.

## ANOVA analysis

The analysis explores the relationship between WTP and consumers’ understanding of selected sustainability labels (Carbon Trust, GMO Free, BIOHELLAS, and Fair Trade). This approach allows for a systematic assessment of factors related to **Research Questions 3 and 5**.

Willingness to pay categories were transformed into a continuous variable using midpoint values for each percentage range, following common practice in consumer behavior research:

| WTP Category | Range  | Midpoint |
|--------------|--------|----------|
| No           | 0      | 0        |
| Up to 5%     | 0-5%   | 2.5      |
| 5-10%        | 5-10%  | 7.5      |
| 10-20%       | 10-20% | 15       |
| >20%         | ≥20%   | 25       |

**Table 31 WTP numeric transformation**

Prior to conducting the ANOVA, Levene’s test was also performed for each question to assess the assumption of homogeneity of variances. Randomness, Independence, Normality and Homogeneity are fulfilled for the following variables:

1. **Understanding of label “Carbon Trust” (question 13) and WTP (question 20)**
2. **Trust in the sustainability labels (question 17) and WTP (question 20)**
3. **Level of income (question 04) and WTP (question 20)**
4. **Education level (question 03) and WTP (question 20)**
5. **Place of residence and WTP (question 05) (question 20)**

The results of the ANOVA test for category are presented in the here below paragraphs:

**RQ3:** Does the level of understanding and trust in sustainability labels influence consumers’ purchasing decisions?

### 1. Understanding of label “Carbon Trust” and WTP

The ANOVA results indicate that **there is no statistically significant difference in WTP across the different levels of understanding the “Carbon trust” label**,  $F(4, 197) = 1.00$ ,  $p = 0.407$ . As the p-value exceeds the conventional significance threshold ( $\alpha = 0.05$ ), the null hypothesis cannot be rejected.

These findings indicate that variations in consumers’ self-reported understanding of the label do not translate into statistically significant differences in their willingness to pay a price premium.

## 2. Trust in labels and WTP

**The results indicate that there are no statistically significant differences in mean WTP across the different trust levels** ( $F(4, 197) = 0.696, p = 0.596$ ), since the observed p-value is higher from the significance threshold ( $\alpha = 0,05$ ). The ANOVA results indicate that variations in trust toward sustainability labels do not translate into differences in consumers' willingness to pay a price premium.

Further to the above tests, ANOVA is also applied to evaluate the relationship of specific demographics with the willingness to pay.

**RQ5:** How do demographic factors (such as income, education, and place of residence) affect consumers' understanding of sustainability labels and their willingness to pay more for sustainable food products?

## 3. Income and WTP

**The results indicated no statistically significant differences in mean WTP across income groups** ( $F(3, 198) = 1.557, p = 0.201$ ), as the p-value is higher than the 0.05 significance level. These results indicate that income does not play a significant role in affecting the willingness to pay of the consumers for food products that carry a sustainable label.

## 4. Education level and WTP

**The analysis revealed no statistically significant differences in mean WTP across education levels** ( $F(3, 198) = 0.603, p = 0.614$ ), as the p-value exceeded the 0.05 significance threshold. This finding indicates that education level does not have a statistically significant effect on consumers stated willingness to pay for sustainability-labelled products.

## 5. Place of residence and WTP

Similar to the previous results, **this analysis showed no statistically significant differences in mean WTP across residential categories** ( $F(2, 199) = 0.392, p = 0.676$ ), as the p-value was well above the 0.05 significance threshold. This finding indicates that place of residence does not have a statistically significant effect on consumers' willingness to pay for sustainability-labelled food products.

**It is important to mention that since regression analysis is more flexible to violation of homoscedasticity, it is considered more reliable to test the relationship between variables.** In the next chapters the linear and logistic regression will follow.

## Multiple Linear regression

Multiple linear regression was applied to evaluate which factor most strongly drives the willingness to pay variable. Two models were developed, the first one included separate understanding variables for each sustainability label, while the second model utilized a composite understanding and trust index. The following table presents the variables that were investigated:

|                      |           | Description                        | Question No    |
|----------------------|-----------|------------------------------------|----------------|
| <b>MODEL A</b>       |           |                                    |                |
| Independent variable |           |                                    |                |
| Y                    | WTP       | Willingness to pay                 | 20             |
| Dependent variables  |           |                                    |                |
| b1                   | Trust     | Trust in sustainability labels     | 17             |
| b2                   | UC        | Understanding “Carbon Trust” label | 13             |
| b3                   | UGMO      | Understanding “GMO Free” label     | 14             |
| b4                   | UBIO      | Understanding “BIO Hellas” label   | 15             |
| b5                   | UFT       | Understanding “Fair Trade” label   | 16             |
| b6                   | Income    | Monthly net Income                 | 04             |
| b7                   | Educ      | Education level                    | 03             |
| b8                   | Age       | Age                                | 01             |
| <b>MODEL B</b>       |           |                                    |                |
| Independent variable |           |                                    |                |
| Y                    | WTP       | Willingness to pay                 | 20             |
| Dependent variables  |           |                                    |                |
| b1                   | Trust_i   | Trust composite index              | 17, 18         |
| b2                   | Underst_i | Understanding composite index      | 13, 14, 15, 16 |
| b3                   | Income    | Monthly net Income                 | 04             |
| b4                   | Educ      | Education level                    | 03             |
| b5                   | Age       | Age                                | 01             |

**Table 32 Multiple linear regression variables**

### Model A Results

R square                0,188  
Significance F        2,227E-06

$$WTP = -2,85 - 0,42Trust - 0,01UC - 0,23UGMO + 1,24UBIO + 0,93UFT - 0,001Income + 0,65Educ + 0,72Age$$

| Variable                           | Coefficient | p-value | Result          |
|------------------------------------|-------------|---------|-----------------|
| Trust in sustainability labels     | -0,42       | 0,25    | not significant |
| Understanding “Carbon Trust” label | -0,01       | 0,96    | not significant |
| Understanding “GMO Free” label     | -0,23       | 0,44    | not significant |
| Understanding “BIO Hellas” label   | +1,24       | 0,0001  | significant     |
| Understanding “Fair Trade” label   | +0,93       | 0,0005  | significant     |
| Monthly net Income                 | close to 0  | 0,13    | not significant |
| Education level                    | +0,65       | 0,34    | not significant |
| Age                                | +0,72       | 0,15    | not significant |

**Table 33 Model A results**

### Model B Results

R square                0,120  
Significance F        0,000131184

$$WTP = -1,19 - 0,56Trust_i + 1,85Underst_i - 0,001Income + 0,43Educ + 0,57Age$$

| Variable                             | Coefficient | p-value | Result          |
|--------------------------------------|-------------|---------|-----------------|
| Trust in sustainability labels index | -0,56       | 0,23    | not significant |
| Understanding index                  | +1,85       | <0,001  | significant     |
| Monthly net Income                   | close to 0  | 0,01    | not significant |
| Education level                      | +0,43       | 0,53    | not significant |
| Age                                  | +0,57       | 0,26    | not significant |

**Table 34 Model B results**

Based on the results of the above analysis, both models indicate that consumer willingness to pay is mainly driven by overall **understanding of sustainability labels** rather than by trust, income or demographics.

## Logistic regression

Logistic regression was also adopted in this study to model the probability of behavior. The binary outcome (yes or no) of the question no 19 *“Have you ever purchased a product specifically because of its sustainability label?”* is used as the dependent variable. The outcome of the logistic regression analysis offers a direct insight for the research questions no 3 and no 4:

**RQ3: Does the level of understanding and trust in sustainability labels influence consumers’ purchasing decisions?**

**RQ4: Are Greek consumers willing to pay a price premium for food products carrying sustainability labels?**

The variables for each model of the logistic regression are presented in the following table:

|                      |           | Description                        | Question No    |
|----------------------|-----------|------------------------------------|----------------|
| <b>MODEL A</b>       |           |                                    |                |
| Independent variable |           |                                    |                |
| Y                    | PB        | Purchase behavior                  | 19             |
| Dependent variables  |           |                                    |                |
| b1                   | Trust     | Trust in sustainability labels     | 17             |
| b2                   | UC        | Understanding “Carbon Trust” label | 13             |
| b3                   | UGMO      | Understanding “GMO Free” label     | 14             |
| b4                   | UBIO      | Understanding “BIO Hellas” label   | 15             |
| b5                   | UFT       | Understanding “Fair Trade” label   | 16             |
| b6                   | Income    | Monthly net Income                 | 04             |
| <b>MODEL B</b>       |           |                                    |                |
| Independent variable |           |                                    |                |
| Y                    | PB        | Purchase behavior                  | 19             |
| Dependent variables  |           |                                    |                |
| b1                   | Trust_i   | Trust composite index              | 17, 18         |
| b2                   | Underst_i | Understanding composite index      | 13, 14, 15, 16 |
| b3                   | Income    | Monthly net Income                 | 04             |

**Table 35 Logistic regression variables**

### Model A Results

$$\text{logit}(p) = -4,04 - 0,05\text{Trust} + 0,02\text{UC} + 0,20\text{UGMO} + 0,61\text{UBIO} + 0,11\text{UFT} + 0,0002\text{Income}$$

$$\text{Odds ratio} = e^b$$

$$\% \text{ change at odds} = (\text{Odds Ratio} - 1) \times 100$$

| Variable                           | Coefficient | Odds ratio | Result                  |
|------------------------------------|-------------|------------|-------------------------|
| Trust in sustainability labels     | -0,052      | 0,949      | -5,1% decrease at odds  |
| Understanding “Carbon Trust” label | +0,023      | 1,024      | +2,4% increase at odds  |
| Understanding “GMO Free” label     | +0,204      | 1,226      | +22,6% increase at odds |
| Understanding “BIO Hellas” label   | +0,609      | 1,839      | +83,9% increase at odds |
| Understanding “Fair Trade” label   | +0,105      | 1,110      | +11,0% increase at odds |
| Monthly net Income                 | +0,0002     | 1,000      | no effect               |

Table 36 Model A results

### Model B Results

$$\text{logit}(p) = -3,96 + 0,24\text{Trust}_i + 0,77\text{Underst}_i + 0,0001\text{Income}$$

$$\text{Odds ratio} = e^b$$

$$\% \text{ change at odds} = (\text{Odds Ratio} - 1) \times 100$$

| Variable                             | Coefficient | Odds ratio | Result                   |
|--------------------------------------|-------------|------------|--------------------------|
| Trust in sustainability labels index | +0,237      | 0,267      | +26,7% increase at odds  |
| Understanding index                  | +0,775      | 2,170      | +117,7% increase at odds |
| Monthly net Income                   | +0,0001     | 1,000      | no effect                |

Table 37 Model B results

Logistic regression results confirm the findings of the multiple linear regression. In both models’ **labels’ understanding has the strongest positive effect** on probability of willingness to pay. The leading labels are the “BIO Hellas” (+83,9%) and the “GMO Free” (+22,6%), furthermore the understanding index in model B has a very positive effect since the increase rises up to +117,7%. **Trust effect** increases in model B (from -5,1% to +26,7%), suggesting that model A results may have been affected by multicollinearity among individual variables. **Income** in both models has no influence in WTP.

## Mediation Analysis

Following the regression analysis (linear and logistic), mediation analysis is adopted to further evaluate if trust mediates the effect of understanding. An index model is applied for the mediation analysis to check the understanding and the trust indices:

Understanding index → Trust index → WTP

| Variable                  | Description                                          | Question No    |
|---------------------------|------------------------------------------------------|----------------|
| WTP – Y                   | Willingness to pay                                   | 20             |
| Trust <sub>i</sub> – M    | Trust in sustainability labels composite index       | 17, 18         |
| Underst <sub>i</sub> – X  | Understanding composite index                        | 13, 14, 15, 16 |
| <b>Regression</b>         |                                                      |                |
| Total effect path c       | $WTP = c \text{ Underst}_i + e$                      |                |
| Path a                    | $Trust_i = a \text{ Underst}_i + e$                  |                |
| Path b & direct effect c' | $WTP = c' \text{ Underst}_i + b \text{ Trust}_i + e$ |                |

Table 38 Mediation analysis variables

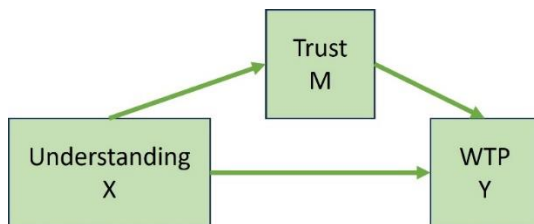


Figure 40 Mediation analysis

## Results

Regression 01:  $WTP = -1,24 + 1,67 \text{ Underst}_i + e$

Regression 02:  $Trust = 1,94 + 0,29 \text{ Underst}_i + e$

Regression 03:  $WTP = -0,31 + 1,81 \text{ Underst}_i - 0,48 \text{ Trust}_i + e$

| Path | Regression            | Coefficient | R Square | p-value |                 |
|------|-----------------------|-------------|----------|---------|-----------------|
| a    | Trust – Understanding | 0,291       | 13,02%   | <0,001  | significant     |
| b    | WTP – Trust           | -0,481      | 10,58%   | 0,3053  | not significant |
| c    | WTP – Understanding   | 1,670       | 10,11%   | <0,001  | significant     |
| c'   | WTP – Understanding   | 1,809       | 10,58%   | <0,001  | significant     |

Table 39 Mediation analysis results

There is no mediation since,  $c' > c$  and b are not significant.

The above results indicate that **Trust does not significantly affect WTP**, this is also confirmed from the regression analysis in the previous chapters. On the other hand, **Understanding has a positive effect on Trust and a strong direct effect on WTP**. Furthermore, the direct effect of Understanding increases when Trust is included in the model indicating the absence of mediation and suggesting a potential suppression effect.

## Cluster Analysis (Consumer Segmentation)

Cluster analysis is also applied to create group of consumers with specific characteristics. The following variables were selected to drive the cluster analysis:

Trust index – questions 17 and 18

Understanding index – question 13, 14, 15 and 16

Willingness to pay – question 20

Sustainability importance – question 08

The here below table presents the centroids, the mean and the standard deviation for each variable:

| Cluster            | Trust | Understanding | WTP   | Importance |
|--------------------|-------|---------------|-------|------------|
| C1                 | 2,83  | 3,05          | 3,85  | 2,86       |
| C2                 | 2,83  | 3,98          | 19,17 | 3,25       |
| C3                 | 3,44  | 3,63          | 3,85  | 3,27       |
| Mean               | 2,83  | 3,05          | 3,85  | 2,86       |
| Standard deviation | 0,71  | 0,88          | 4,63  | 0,85       |

**Table 40 Cluster analysis results**

Trust in the second cluster is extremely high (19,17), indicating that this cluster is probably driven by outliers. In order to eliminate the WTP outliers, logarithmic transformation is applied for the WTP variable. The following table presents the updated data:

| Cluster            | Trust | Understanding | WTP  | Importance |
|--------------------|-------|---------------|------|------------|
| C1                 | 2,83  | 3,05          | 1,05 | 2,86       |
| C2                 | 3,04  | 4,00          | 2,43 | 3,27       |
| C3                 | 2,83  | 3,05          | 1,13 | 4,06       |
| Mean               | 2,83  | 3,05          | 1,05 | 2,86       |
| Standard deviation | 0,71  | 0,88          | 0,76 | 0,85       |

**Table 41 Cluster analysis results (WTP log transformation)**

Following the log transformation the WTP variable, the clustering results became more stable. Clusters are explained and analyzed as per below:

- C1 The results are aligned with the mean for each variable. This is a **baseline group of consumers with moderate attitudes** and relatively low perceived importance of sustainability.
- C2 The second cluster indicates a very high understanding, a high perceived importance of sustainability and a high WTP. Trust on the other hand is slightly above average. Consumers of this cluster can be considered as **highly aware and ethical**.

- C3 The third cluster indicates a high importance and low to average trust, understanding and WTP. Consumers of this cluster can be characterized as **concerned but unconvinced**.

The description of each cluster is summarized in the here below picture:

| CLUSTER 1                  | CLUSTER 2                   | CLUSTER 3                                           |
|----------------------------|-----------------------------|-----------------------------------------------------|
| SKEPTICS / LOW INVOLVEMENT | HIGH AWARE & WILLING TO PAY | CONCERNED BUT UNCONVINCED (ATTITUDE – BEHAVIOR GAP) |

Figure 41 Cluster analysis figure

The above findings indicate an **attitude – behavior gap** which needs to be further examined. The following three models are developed to examine the main drivers of consumers’ behavior:

**Model A:** Does Importance predict Purchase?

$$\text{logit}(p) = b_0 + b_1 \text{Importance} + b_2 \text{Trust}_i + b_3 \text{Underst}_i$$

**Model B:** Relationship between cluster and Purchase variable.

$$\text{Purchase} = f(\text{Cluster})$$

**Model C:** Moderation Analysis - Interaction Effects between Importance and Trust

$$\text{Purchase} = b_0 + b_1 \text{Importance} + b_2 \text{Trust}_i + b_3 (\text{Importance} \times \text{Trust}_i)$$

## Model A Variables & Results

|                      |             | Description                                       | Question No               |
|----------------------|-------------|---------------------------------------------------|---------------------------|
| Independent variable |             |                                                   |                           |
| Y                    | PB          | Purchase behavior                                 | 19                        |
| Dependent variables  |             |                                                   |                           |
| b1                   | Importance  | Importance of sustainability in purchase decision | 8                         |
| b2                   | Trust_i     | Trust composite index                             | 17, 18                    |
| b3                   | Underst_i   | Understanding composite index                     | 13, 14, 15, 16            |
| Variable             | Coefficient | Odds ratio                                        | Result                    |
| Importance           | +0,756      | 2,129                                             | +112,9 % increase at odds |
| Trust index          | +0,106      | 1,112                                             | +11,2 % increase at odds  |
| Understand index     | +0,707      | 2,028                                             | +102,8 % increase at odds |

**Table 42** Post cluster analysis - model A

$$\text{logit}(p) = -5,43 + 0,76\text{Importance} + 0,11\text{Trust}_i + 0,71\text{Underst}_i$$

The results are aligned with the regressions applied in the previous paragraphs. Understanding remains the most important variable when it comes to purchase behavior. Additional to the “Understanding”, the level of importance has a very strong positive effect to the purchase decision, **as the perceived importance of sustainability increases, there probability for a consumer to purchase a sustainable labeled product is higher.** Regression indicates that importance matters, however for a specific segment (Cluster 3) it is not enough.

## Model B Variables & Results

Model B examines if the cluster where the consumers are assigned affects the purchase decision. A dummy variable was developed for each cluster. Cluster 1 is the reference / baseline cluster; hence the model compares Cluster 2 vs Cluster 1 and Cluster 3 vs Cluster 1:

|                      |    | Description                           | Question No |                      |
|----------------------|----|---------------------------------------|-------------|----------------------|
| Independent variable |    |                                       |             |                      |
| Y                    | PB | Purchase behavior                     | 19          |                      |
| Dependent variables  |    |                                       |             |                      |
| b0                   | C1 | Cluster 1 - baseline                  | -           |                      |
| b1                   | C2 | Cluster 2 - highly aware and ethical  | -           |                      |
| b2                   | C3 | Cluster 3 - concerned but unconvinced | -           |                      |
| Variable             |    | Coefficient                           | Odds ratio  | Purchase Probability |
| Intercept – C1       |    | -1,222                                | 0,295       | 23%                  |
| C2                   |    | +2,657                                | 14,254      | 81%                  |
| C3                   |    | +1,158                                | 3,0182      | 48%                  |

**Table 43 Post cluster analysis - model B**

$$\text{logit}(p) = -1,22 + 266C2 + 1,16C3$$

The above results confirm the attitude – behavior gap, since the cluster 3 includes the consumers that consider sustainability important, however, the probability to proceed to the purchase of a sustainable product remains low. **Importance alone is not enough to drive a consumer to purchase a product.**

### Model C Moderation Analysis - Interaction Effects

Model C examines if labels work only when trust exists, thus moderation analysis is applied and the method used is the multiple linear regression. Interaction term is the “Importance x Trust”, before applying interaction variables were mean – centered to reduce multicollinearity:

|                      |                    | Description                                       | Question No     |
|----------------------|--------------------|---------------------------------------------------|-----------------|
| <b>MODEL C</b>       |                    |                                                   |                 |
| Independent variable |                    |                                                   |                 |
| Y                    | Purchase           | Purchase behavior                                 | 19              |
| Dependent variables  |                    |                                                   |                 |
| b1                   | Importance         | Importance of sustainability in purchase decision | 8               |
| b2                   | Trust_i            | Trust composite index                             | 17, 18          |
| b3                   | Interaction        | Importance x Trust                                | -               |
| <b>Variable</b>      | <b>Coefficient</b> | <b>p-value</b>                                    | <b>Result</b>   |
| Importance           | +0,154             | close to 0                                        | significant     |
| Trust index          | +0,056             | 0,24                                              | not significant |
| Importance x Trust   | -0,004             | 0,93                                              | not significant |

Table 44 Post cluster analysis - model C

R square            0,097  
Significance F      7,13

$$Purchase = 0,34 + 0,15Importance + 0,06Trust_i - 0,004(Importance \times Trust_i)$$

The overall regression model was statistically significant ( $F = 7.13$ ,  $p < 0.001$ ), explaining approximately 9.7% of the variance in purchase behavior ( $R^2 = 0.097$ ). The results indicate that there is no moderation, **the perceived importance does not change with trust and independently the importance affects the sustainable purchasing decisions**. Hence, the attitude – behavior gap in cluster 3 cannot be explained only from the “Trust” variable.

## SECTION E – Final Opinions

### 23. Which factors would make you trust a sustainability label more? (multiple choice)

| Factor to make you trust sustainability labels more | Frequency  | %              | Valid %        | Cumulative % |
|-----------------------------------------------------|------------|----------------|----------------|--------------|
| Recognized certification body                       | 148        | 34,82%         | 34,82%         | 34,82%       |
| Awareness campaigns                                 | 90         | 21,18%         | 21,18%         | 56,00%       |
| Company transparency                                | 95         | 22,35%         | 22,35%         | 78,35%       |
| Legislation & control                               | 89         | 20,94%         | 20,94%         | 99,29%       |
| Other                                               | 3          | 0,71%          | 0,71%          | 100,00%      |
| <b>Grand Total</b>                                  | <b>425</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 45 Factors to make you trust sustainability labels more

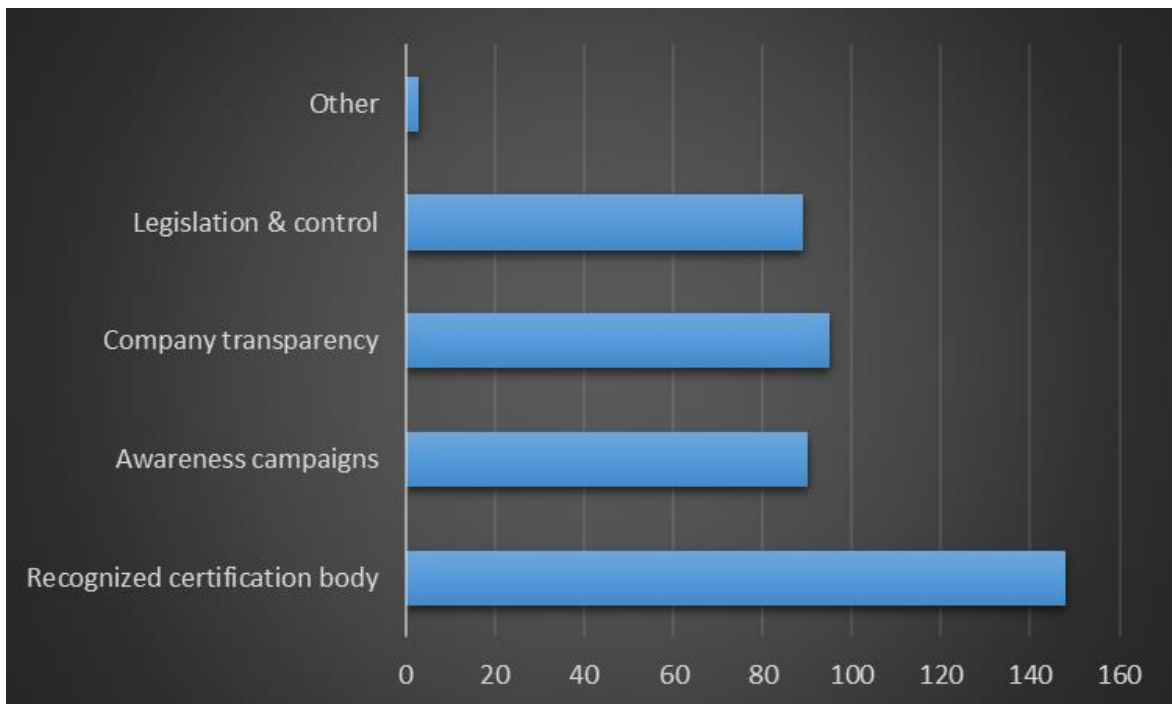


Figure 42 Factors to make you trust sustainability labels more

The results of Question 23 highlight the key factors that strengthen consumers' trust in sustainability labels. The “Recognized certification body” is the most important factor (148 respondents), followed by the “Company transparency” (95 respondents), “Awareness campaigns” (90 respondents) and “Legislation & control” (89 respondents). This highlights the importance of independent certification bodies.

**24. Do you believe that such labels contribute to more responsible consumer behavior?**

| Labels contribution to more responsible consumers | Frequency  | %              | Valid %        | Cumulative % |
|---------------------------------------------------|------------|----------------|----------------|--------------|
| No                                                | 12         | 5,94%          | 5,97%          | 5,97%        |
| Not sure                                          | 50         | 24,75%         | 24,88%         | 30,85%       |
| Yes                                               | 139        | 68,81%         | 69,15%         | 100,00%      |
| (blank)                                           | 1          | 0,50%          | -              | -            |
| <b>Grand Total</b>                                | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 46 Labels contribution to more responsible consumers

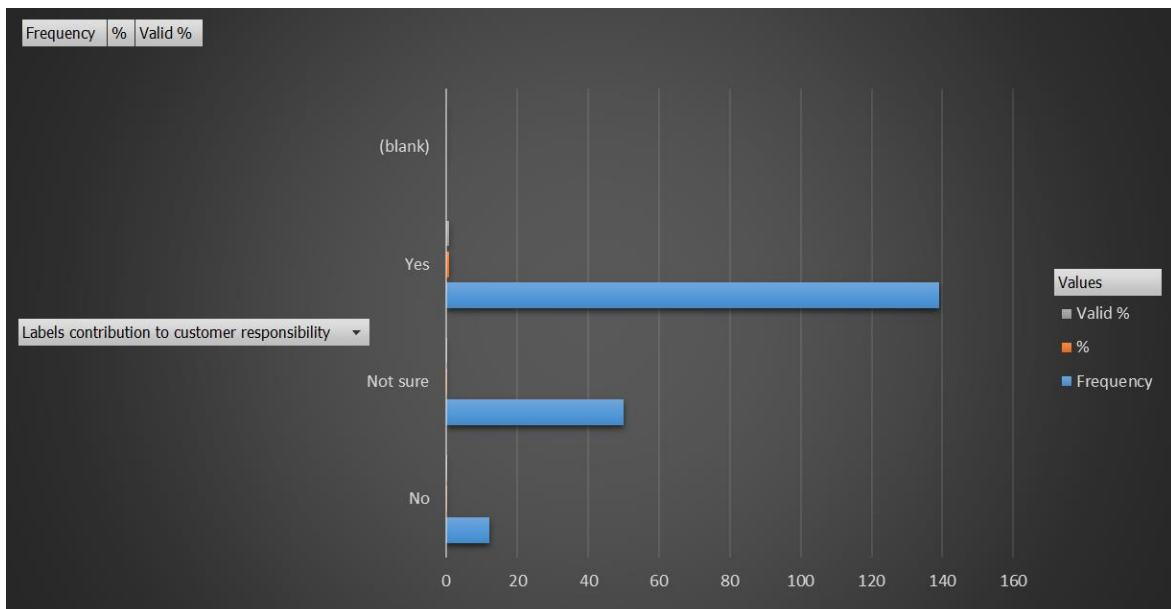


Figure 43 Labels contribution to more responsible consumers

The results of Question 24 indicate that the majority of respondents (139 replies) believe sustainability labels contribute to more responsible consumer behavior. These findings suggest that sustainability labels are generally perceived as meaningful informational tools that can raise awareness and encourage more conscious consumption choices.

## 25. Would you like to be better informed about sustainability labels and company practices?

| Information about sustainability labels and company practices | Frequency  | %              | Valid %        | Cumulative % |
|---------------------------------------------------------------|------------|----------------|----------------|--------------|
| No                                                            | 10         | 4,95%          | 4,95%          | 4,95%        |
| Yes                                                           | 192        | 95,05%         | 95,05%         | 100,00%      |
| <b>Grand Total</b>                                            | <b>202</b> | <b>100,00%</b> | <b>100,00%</b> |              |

Table 47 Further Information about sustainability labels and company practices

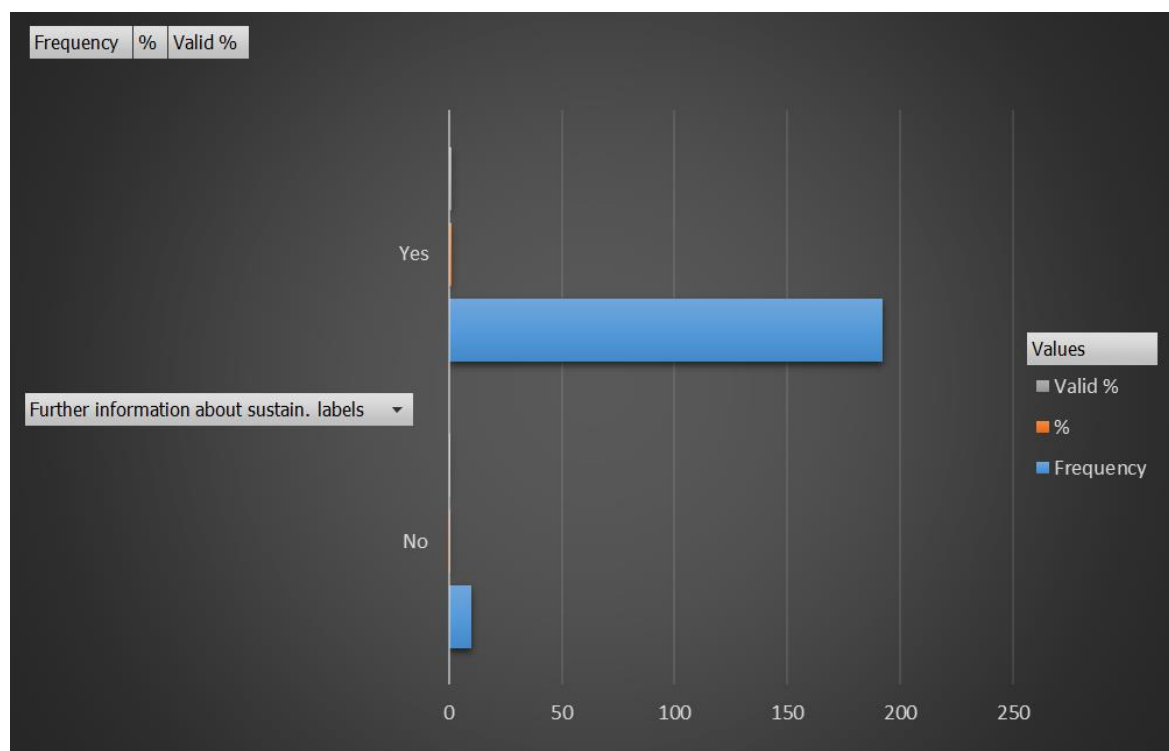


Figure 44 Further Information about sustainability labels and company practices

The results of Question 25 clearly indicate a strong demand among consumers for better information regarding sustainability labels and company practices.

Chapter 4.1 presented the findings of the study based on the analysis of the questionnaire data. The results provided insights into consumers' demographics, purchasing habits, awareness, understanding, trust in sustainability labels, and willingness to pay for sustainability-labelled food products. Through the application of descriptive statistics and inferential methods, including chi-square tests, ANOVA, linear and logistic regression and mediation, the analysis highlighted key patterns, relationships, and limitations. Furthermore, the cluster analysis aimed to create group of consumers with similar characteristics and offer insights on how customer understand the sustainability labels.

## 4.2 Conclusions and recommendations

The final chapter of this study presents the key findings of the analysis conducted in chapter 4.1. The chapter summarizes the main conclusions related to consumers' awareness, understanding, trust, purchase behavior and willingness to pay for sustainability-labelled food products. Firstly, a table is presented, summarizing the results of each statistical analysis applied, furthermore a description of the descriptive analysis results is also presented. Following the statistical analysis results, the chapter presents a discussion, structured around the five main research questions:

**RQ1:** To what extent do Greek consumers recognize and understand sustainability labels on food products?

**RQ2:** How much do consumers trust sustainability labels related to environmental and ethical food production?

**RQ3:** Does the level of understanding and trust in sustainability labels influence consumers' purchasing decisions?

**RQ4:** Are Greek consumers willing to pay a price premium for food products carrying sustainability labels?

**RQ5:** How do demographic factors (such as income, education, and age) affect consumers' understanding of sustainability labels and their willingness to pay more for sustainable food products?

Finally, there is a short presentation of managerial and policy recommendations, followed by the main limitations of the study and future research recommendation.

### Statistical analysis results

The descriptive analysis results indicate that the demographic profile of the replies shows a sample where the majority of the consumers are middle-aged, highly educated, living in urban areas, and with a moderate to high income level. This consumer profile is exposed to sustainability-related information and in the following chapters, the statistical analysis investigates how much the demographics affect the understanding of sustainability labels, the trust and the willingness to pay.

The importance of sustainability for the consumers remains moderate. However, consumers generally express positive attitudes toward sustainable food products. When it comes to understanding and awareness of the sustainability labels, the labels that are related to food ingredients or organic food production are recognized and understandable (BIO Hellas & GMO free). On the other hand, labels related to ethical aspects or to the sustainable way of the package production are not recognized (Carbon Trust & Fair trade). Finally, the willingness to pay is also moderate, indicating that consumers need to be further convinced in order to pay more for a food product carrying a sustainability label.

The following table summarizes the regression analysis results both for the linear and the logistic model:

| Variable                       | Model 1:<br>Linear<br>(Labels) | Model 2:<br>Logistic<br>(Labels) | Model 3:<br>Linear<br>(Index) | Model 4:<br>Logistic<br>(Index) |
|--------------------------------|--------------------------------|----------------------------------|-------------------------------|---------------------------------|
| Trust in sustainability labels | -0.421<br>(0.248)              | -0.052                           | -0.565<br>(0.232)             | 0.237<br>(+26.7%)               |
| Understanding “Carbon Trust”   | -0.015<br>(0.960)              | 0.023                            | -                             | -                               |
| Understanding “GMO Free”       | -0.229<br>(0.436)              | 0.204                            | -                             | -                               |
| Understanding “BIO Hellas”     | 1.237*<br>(0.0001)             | 0.609                            | -                             | -                               |
| Understanding “Fair Trade”     | 0.933*<br>(0.0005)             | 0.105                            | -                             | -                               |
| Understanding (Index)          | -                              | -                                | 1.850*<br>(0.0000)            | 0.775<br>(+117%)                |
| Monthly net Income             | -0.001<br>(0.127)              | 0.0002                           | -0.001<br>(0.097)             | 0.0001<br>(0%)                  |
| Education level                | 0.651<br>(0.337)               | -                                | 0.434<br>(0.533)              | -                               |
| Age                            | 0.718<br>(0.151)               | -                                | 0.566<br>(0.264)              | -                               |
| Intercept                      | -2.847                         | -4.038                           | -1.188                        | -3.958                          |
| R <sup>2</sup>                 | 0.188                          | -                                | 0.120                         | -                               |
| Model Significance             | <0.001                         | -                                | <0.001                        | -                               |

**Table 48 Comparative Regression Results**

Notes:

- p-values are reported in parentheses
- \*p < 0.01
- Logistic regression coefficients are presented as log-odds and percentage changes reported where applicable.

The regression analysis demonstrates that understanding is the significant predictor of willingness to pay, trust on the other hand presents a high probability when the index methodology was chosen. Consumers who better understand sustainability labels are more likely to pay a price premium. The label that drives this result is the “BIO Hellas”, since both in linear and logistic regression has a positive coefficient. This can be explained by the fact that “BIO Hellas” label has the higher presence in the Greek market and it is highly recognized by Greek consumers.

Further to the regression analysis, a mediation analysis was conducted to evaluate if trust mediates the effect of understanding. The analysis showed that understanding partially mediates the relationship between trust and WTP and has a clear positive effect on Trust and a strong direct effect on WTP. As a result, trust improves the effectiveness of sustainability labels by making the consumers to accept easier the information provided.

Finally, cluster analysis identified three distinct consumer segments with behavioral pattern differentiation. Figure 41 presented in chapter 4.1 describes the segments as per below:

- C1 – Skeptics / Low involvement
- C2 – High aware and willing to pay
- C3 – Concerned but unconvinced (attitude – behavior gap)

The following scatter plot describes the consumer segmentation based on trust and WTP:

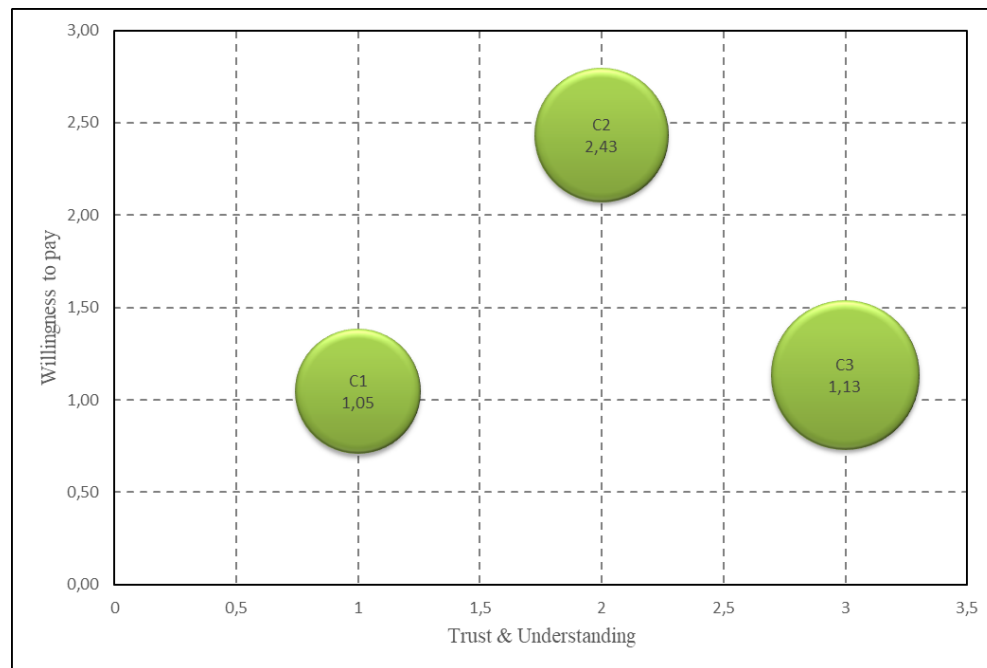


Figure 45 Consumer Segmentation Based on Trust and WTP

Although a segment of consumers demonstrates high levels of trust, understanding, and perceived importance of sustainability labels (Cluster 3), this does not necessarily translate into a higher willingness to pay, suggesting the presence of an **attitude–behavior gap**. Following the cluster analysis, additional regression analysis was applied to examine the attitude – behavior gap. The analysis revealed that sustainability importance significantly influences purchasing behaviour, however this effect varies across consumer segments. Highly aware consumers respond strongly to sustainability labels, while other consumers present an attitude–behavior gap, indicating that **positive attitudes do not always translate into actual purchasing decisions**.

## **Research questions discussion**

**Research question 1:** To what extent do Greek consumers recognize and understand sustainability labels on food products?

In addressing Research Question 1, the results indicate a moderate level recognition and understanding of sustainability labels. Recognition and understanding also varies significantly across different label types. As shown in table 24 (Chapter 4.1), the labels with the highest recognition and understanding are the “BIO Hellas – EU Organic” and the “GMO Free”. This can be explained by the fact that these labels provide a clear messaging connected to product ingredients and to production process. Consumer are generally more sensitive to this kind of information, since it affects them more directly. In contrast, “Carbon Trust” and “Fairtrade” labels present a lower level of awareness and understanding. These labels are providing information which are more technical or ethically oriented and consumers cannot easily be connected with such information. As a result, the result suggests that a clear message plays a critical role in affecting customers’ ability to recognize and understand sustainability labels.

**Research question 2:** How much do consumers trust sustainability labels related to environmental and ethical food production?

Overall, the findings related to Research Question 2 indicate that Greek consumers have a moderate level of trust in sustainability labels. The majority of the replies in questions 17 and 18 indicate a moderate trust, however, there is a significant proportion of replies in question 18 suggests that they are not sure if these labels reflect the sustainability of the food product. Chi-square analysis was performed to examine the relationship between trust and demographic variables such as age and place of residence. The results cannot be considered robust, since there were methodological limitations related to sample distribution. Hence, even if demographic factors may influence trust indirectly, no conclusions can be found within the present study.

**Research question 3:** Does the level of understanding and trust in sustainability labels influence consumers’ purchasing decisions?

The findings related to Research Question 3 indicate that the main factor that influences consumers purchase behavior is the “understanding”. Consumers who better understand the meaning of sustainability labels are more likely to accept higher prices for them. It is also important to highlight that the label driving these results is primarily the “BIO Hellas – EU Organic”. On the other hand, trust has the potential to influence the willingness to pay when the index approach is applied for questions 17 and 18. Finally, the cluster analysis indicates that there is a significant proportion of consumers that has high levels of trust and understanding, however they are not convinced to pay more for a product

carrying a sustainability label. This, as already mentioned, suggests an attitude – behavior gap that is common in “ethical” or “green” products.

**Research question 4:** Are Greek consumers willing to pay a price premium for food products carrying sustainability labels?

Research question 4 investigates whether consumers are willing to pay more for sustainability – labeled food products. The survey results, without statistical analysis, indicate a generally positive but limited willingness to pay a price premium. This willingness is mainly focused on a small price increase, meaning that even if consumers recognize and understand the importance of sustainability, they cannot easily accept paying a price premium. After applying statistical analysis, as presented in the research question 3, the main driver of the willingness to pay is the understanding variable. Food production companies and certification bodies will convince consumers by making the understanding clearer.

**Research question 5:** How do demographic factors (such as income, education, and age) affect consumers’ understanding of sustainability labels and their willingness to pay more for sustainable food products?

Overall, the findings related to Research Question 5 indicate that consumers’ willingness to pay a price premium for food products carrying sustainability labels is not significantly influenced by the examined demographics. The chi-square analysis showed a positive association of the Education level with the willingness to pay; however, a larger and more evenly distributed sample is suggested for more reliable results. Furthermore, regression models revealed that income level, age, and education level did not indicate a strong or statistically important effect on willingness to pay. These findings suggest that demographic characteristics alone do not strongly affect consumers’ purchasing decisions.

The following table provides a structured overview of the main findings of the study, summarizing the key conclusions for each research question based on the statistical analyses conducted.

| Research Question | Core Focus                                                 | Key Findings                                                                                                                                                                                                                            |
|-------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RQ1</b>        | Recognition & understanding of sustainability labels       | High recognition for national and familiar labels (e.g. BIOHELLAS, GMO Free); lower recognition and understanding for international or ethical labels (Carbon Trust, Fair Trade). Understanding level vary significantly across labels. |
| <b>RQ2</b>        | Trust in sustainability labels                             | Overall moderate trust; trust varies by label type. Trust does not translate into behavioral outcomes.                                                                                                                                  |
| <b>RQ3</b>        | Influence of understanding & trust on purchasing decisions | Regression analysis results indicate an influence mainly of the “understanding variable”. BIO Hellas is the label the presents the highest influence. Trust presents a significant influence after applying the index variable.         |
| <b>RQ4</b>        | Willingness to pay a price premium                         | Willingness to pay only for small price premiums.                                                                                                                                                                                       |
| <b>RQ5</b>        | Role of demographics in WTP                                | Income, education level, and place of residence do not significantly affect willingness to pay. WTP cannot be explained by demographic variables.                                                                                       |

**Table 49 Key findings**

## **Managerial Recommendations**

Regression analysis showed that the main factor driving the willingness to pay is the “Understanding” variable, especially the for “BIO-Hellas” label. Food companies should invest in a clear and simpler sustainability communication. Labels should be easy to understand and visually recognizable. It is also important for Greek consumers to feel that the sustainable product benefits themselves, hence labels should be focused on food processing and on the final ingredients of the product. In that way consumers will connect sustainability with personal benefits such as health, safety, and product quality. Complex certifications that focus on technical aspects of a product may reduce confidence.

Marketing strategies should be adapted according to consumer segments. The less engaged consumers may require educational campaigns, while the highly engaged consumer require a better position of the product.

## **Policy Recommendations**

Certification bodies should strengthen consume education and help food companies built trust on the sustainability. A more unified certification framework would also help consumers to compare products easily. The label “BIO – Hellas, Euro leaf” may give an example, since it is a unified certification shared within the EU. Similar practices can be adopted for more “ethical” labels such as the “Fair trade”. Government support for transparent sustainability practices and stronger monitoring mechanisms can reduce misleading claims and protect both consumers and genuinely sustainable producers.

## **Limitations and Future Research**

This study has certain limitations. The most important is the sample size. Additionally, self-reported survey responses may not fully reflect actual purchasing behavior in real market conditions.

Future research could expand the sample across multiple regions and include areas outside Athens. Furthermore, additional labels may be included in future research, in order to focus in different certifications each time.

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## Appendix A: “Survey Questionnaire”



Questionnaire  
rev01.pdf

**Author’s Statement:**

I hereby declare that, in accordance with article 8 of Law 1599/1986 and article 2.4.6 par. 3 of Law 1256/1982, this thesis/dissertation is solely a product of personal work and does not infringe any intellectual property rights of third parties and is not the product of a partial or total plagiarism, and the sources used are strictly limited to the bibliographic references.