

# Data-enabled Business Models and Market Linkages Enhancing Value Creation and Distribution in Mediterranean Fruit and Vegetable Supply Chains (MED-LINKS)

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## DELIVERABLE 1.3 – REPORT ON CONSUMER ATTRIBUTE APPRECIATION AND WILLINGNESS TO PAY

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## LIST OF ACRONYMS AND ABBREVIATIONS

AB	Agriculture biologique
AOP	Appellation d'Origine Protégée
DS	Direct survey
EOL	Economy of Love
EOSC	Export-oriented supply chains
F&V	Fruit and vegetables
FG	Focus Group
FRL	Food-related lifestyle
GPP	Green public procurement
PCA	Principal Component Analysis
SFSCs	Short food supply chains
SPG	Systems participatifs de garantie
TSG	Traditional specialties guaranteed
VSS	Voluntary sustainability standards





## EXECUTIVE SUMMARY

This deliverable is composed of 2 parts:

- PART 1 Consumer report on attribute appreciation and willingness to pay
- PART 2 Training content from WP1

## PART 1:

This part is a contribution to Task 1.3 to assesses the attitudes, preferences, and purchasing behaviours of national and international consumers regarding certain fruit and vegetables (F&V) within specific supply chain systems so that the various actors can best respond to the needs of the market. We intend to assess consumer preferences by focusing on their orientation toward sustainable and high-quality products and their willingness to pay for these attributes. In addition, we focus on the appreciation for adopting voluntary sustainability standards (VSS) in specific territorial clusters in the countries studied: Egypt, France, Greece, Italy, and Morocco.

The report considers three trade circuits (or chains of interest) that are fundamental for Mediterranean countries, namely: i) local short food supply chains (SFSCs), ii) green public procurement (GPP), and iii) export-oriented supply chains (EOSC). The research provides both a theoretical framework and an empirical assessment of the factors that determine consumer preferences.

According to the results, F&V choice criteria such as freshness and seasonality, as well as benefits and risks perceptions of these products consumption, were the main drivers that influenced the preferences of F&V consumption in the three supply chain systems. Relevant certifications and standards can also be referred as another influencing factors. According to research findings, levels of satisfaction and trust in available certifications varied across the target countries. Although most consumers were partially satisfied with the available certificates, the satisfaction level was higher for GPP than for the other two supply chains of SFSCs and EOSC. In addition, regarding upcoming socioeconomic and environmental certifications, information such as working conditions and support of local farmers as socioeconomic certification and reduction using of pesticide/fertilizer and low carbon emissions as environmental certification perceived important to consumers in the three supply chains. In terms of consumer appreciation and willingness to pay for these sustainability certifications, more consumers were willing to pay a higher price premium for F&V with an environmental certification than for a socioeconomic certification. Furthermore, more consumers in the EOSC were willing to pay up to 5% for socioeconomic and environmental certifications than in the GPP and SFSC. Finally, different clusters or segments of F&V consumers were categorized based on several factors. Healthconscious consumers, value-conscious consumers, and quality-conscious consumers were the most numerous consumer clusters in SFSCs, GPP, and EOSC, respectively.





## **PART 2:**

This part contributes to the presentation of training content modules (TM) drawing from a selection of key information developed within WP1 and presented in deliverables D1.1, D1.2, and D1.3.

## Deliverable 1.1 – Report on Supply Chain Systems definition and Cluster Identification (CIHEAM-IAMM),

The objective of this deliverable was to develop a theoretical model for the analysis of supply chain systems of F&V in the Mediterranean region, including the drivers determining their organisational characteristics, the internal relationships and dynamics, and the related performance.

## Deliverable 1.2 – Report on structure of five Mediterranean clusters (UCA-UMI),

The objective of this report was to contribute to measure and assess the degree of importance of indicators related to external factors (economic, environmental, rules, behavioral attitude), strategic choices and performance of these supply chains. In addition, five F&V production clusters in the Mediterranean partner countries were defined and delineated at the geographical and economic level.

## The training content drawn by Deliverable 1.1 and 1.2 is contained in TM0.1

#### Deliverable 1.3 – Consumer report on attribute appreciation and willingness to pay (UNIBO).

The aim of this deliverable was to provide small-scale producers with effective and tailored solutions that improve efficiency, sustainability, and equity along F&V supply chains in Mediterranean countries. Accordingly, this task assessed the attitudes, preferences, and purchasing behaviours of national and international consumers with respect to specific F&V products within specific supply chain systems so that the various actors can best respond to the needs of the market.

The training content drawn by Deliverable 1.3 is contained in TM1.1 to TM1.5

The main contributions to Sustainable Development Goals (SDGs) of the activities performed and the results obtained are outlined at the end of the report.







## PART 1 – CONSUMER REPORT ON ATTRIBUTE APPRECIATION AND WILLINGNESS TO PAY

## 1. Introduction

## 1.1. Aims of Task 1.3 and Deliverable 1.3.

Mediterranean F&V supply chains face the complexities of today's global marketplace. The European Union is an importer of F&V, currently accounting for one-third of the value of all imports of primary food commodities. Southern Mediterranean countries are one of the most important sources of F&V supply. The globalization of food systems represents a great opportunity for the development of the entire agricultural sector in the Mediterranean region. However, it also poses significant challenges to actors in the local economy. These include the uncertainty of supply and demand, the lack of clarity about the quality of fresh produce, and the fact that enough are not available over time or in a given location. This is especially true of fragmented production structures, which consist mainly of small producers. On the one hand, they are the main actors responsible for local food security and employment; on the other hand, they are not yet sufficiently connected to markets. The reasons may include information deficits and asymmetries, small and geographically fragmented production volumes, remoteness and transportation costs, and difficulties in meeting stringent food safety and traceability requirements. Consumers are increasingly expressing a desire to evaluate the quality and sustainability of food - and fresh food in particular - by acquiring elements such as provenance and certification of production and distribution systems. However, due to internal difficulties and market dynamics, stakeholders are not always able to communicate to the final consumer the different meanings of the term sustainability, as well as some specificities of the production cycle. Therefore, there is a general need to raise awareness of the issue. The sustainability claims indicated on the labels can be a tool to reduce this asymmetry, to spread the knowledge about the topic and thus to valorize the product.

Considering this introduction, the aim of this task is to provide small-scale producers with effective and tailored solutions that improve efficiency, sustainability, and equity along F&V supply chains in Mediterranean countries. Accordingly, this task assesses the attitudes, preferences, and purchasing behaviours of national and international consumers with respect to specific F&V products within specific supply chain systems so that the various actors can best respond to the needs of the market. We intend to assess consumer preferences by focusing on their orientation toward sustainable and high-quality products and their willingness to pay for these attributes. We consider three trade circuits (or chains of interest) that are considered fundamental for Mediterranean countries: local short food supply chains (SFSCs), green public procurement (GPP), and export-oriented supply chains (EOSC). This research provides both a theoretical framework and an empirical assessment of the factors that determine consumer preferences. In particular, we focus on the appreciation for adopting voluntary sustainability



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standards (VSS) in specific territorial clusters in the countries studied: Egypt, France, Greece, Italy, and Morocco.

Considering these described aims, the research questions will be as follows:

1. What are the main drivers that influence the preferences of fruit and vegetable consumption in the three supply chain systems (SFSCs, GPP, and EOSC)? (Identify the main factors influencing F&V market conditions and trends in Mediterranean countries).

2. What standards do consumers look for in fruit and vegetable certifications? (Quality, safety, health benefits, allergens, ingredients, variety, ...)

3. Have recent certifications been able to satisfy consumers? (Consumer trust in certain existing certifications).

4. Are consumers interested in suggested (new) sustainability certifications and how willing are they to pay for them? (Consumer appreciation and willingness to pay).







## 1.2. Fruit and vegetable market trends in Meditation countries

The Mediterranean climate is characterized by mild, wet winters and hot, dry summers, making it suitable for growing a wide range of fruits, vegetables and other agricultural products. Some of the major F&V grown in Mediterranean countries are (Mrabet et al., 2020):

- a) Olives: olive trees are abundant in the Mediterranean region, and olive oil production is a major industry in countries such as Spain, Italy, Greece, and Tunisia.
- b) Wine Grapes: Vineyards thrive in the Mediterranean climate, and the region is known for its wine production. Countries such as France, Italy, Spain and Greece are major wine producers.
- c) Citrus: Oranges, lemons and other citrus fruits are grown extensively in countries such as Spain, Italy and Greece.
- d) Tomatoes: Tomatoes are a staple in Mediterranean cuisine, and countries such as Spain, Italy, and Turkey are major producers.
- e) Other vegetables: A variety of vegetables are grown, including eggplant, peppers, zucchini, artichokes, and onions.

The Mediterranean diet, which emphasizes fruits and vegetables, has gained popularity worldwide because of its health benefits. This has led to increased interest in Mediterranean fruits and vegetables worldwide (Sikalidis et al., 2021). As in many other parts of the world, consumers in Mediterranean countries became more health conscious and concerned about the potential harmful effects of pesticides and synthetic chemicals used in conventional agriculture. As a result, they sought organic products grown without synthetic pesticides and fertilizers to reduce exposure to these substances (Annunziata et al., 2019).

Demand for organic fruits and vegetables has increased in Mediterranean countries and worldwide. Consumers in these countries have shown a preference for organic, locally produced products because they perceive their health and environmental benefits (Annunziata et al., 2019). In addition, there was a growing demand for organic products in export markets, especially in European countries, where consumers were willing to pay a premium for organic products (Willer et al., 2023). Some Mediterranean countries had offered support and incentives to farmers to convert to organic farming methods. Government initiatives such as subsidies, certification support, and research funding encouraged more farmers to adopt organic methods. Organic farming methods are generally considered more environmentally friendly than conventional methods. By choosing organic products, consumers in the Mediterranean region contributed to the preservation of biodiversity, soil health, and water quality. Over time, the availability and accessibility of organic products increased in Mediterranean countries.







Supermarkets, farmers' markets, and online platforms began to offer a wider range of organic fruits and vegetables to meet the growing demand (Willer et al., 2023).

#### **Export and Import Trends:**

Mediterranean countries are known for their diverse agricultural landscapes and climates, which allow them to produce a wide variety of fruits and vegetables throughout the year. This diversity has made them important exporters of fresh produce. Some Mediterranean countries, such as Spain and Italy, are major exporters of fruits and vegetables to other European countries and beyond. In countries such as Greece and Cyprus, imports of certain fruits and vegetables have increased due to consumer preferences and market demand. The region's favorable climate allowed for diverse crop production, making it a major exporter of fresh produce to various international markets. At the same time, due to different harvest calendars and consumer demand, Mediterranean countries have also imported certain fruits and vegetables to meet domestic demand (FruitLogistica, 2020). Because competing in Europe during the peak season is difficult and only possible if there are enough local producers in Europe. Figure 1 shows the seasonal supply in different seasons in Europe.

	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
apples												
strawberries												
berries (blueberry, raspberry)												
grapes												
melons												
stone fruit					-							
sweet cherries												
aubergine												
green beans												
pumpkins												

low supply, high prices increasing or declining supply high availability peak season for local supply

## Figure 1. Seasonal calendar of production of some F&V in Europe

Source: CBI (2022)

Therefore, European companies are completing and developing local supply of F&V by producing and supplying more sources in neighboring countries such as Egypt, Morocco, Tunisia and Turkey. Countries that often have a favorable climate and lower production costs. Seasons in neighboring producing countries overlap with European harvests. F&V can be produced and marketed early in the season when European products are not yet ready for the market. On the





other hand, this production process also creates economic opportunities for neighboring countries. Morocco and Egypt are currently the main exporters of F&V to Europe (CBI, 2022).

In general, the export and import trends are as follows:

## Export Trends:

- a) Citrus: Countries such as Spain, Turkey, and Egypt were among the leading exporters of citrus fruits, including oranges, tangerines, lemons, and grapefruits.
- b) Olives and olive oil: Mediterranean countries, particularly Spain, Italy, and Greece, were major exporters of olives and olive oil.
- c) Tomatoes: Spain and Italy were major exporters of fresh tomatoes and tomato-based products.
- d) Grapes and wine: Mediterranean countries such as France, Italy, Spain and Greece were known for their exports of grapes and wine.
- e) Other fresh fruits: Countries such as Spain, Italy and Turkey also exported other fresh fruits such as strawberries, watermelons and melons.

## Import Trends:

- a) Tropical fruits: Mediterranean countries imported a variety of tropical fruits, including bananas, pineapples, mangoes, and avocados, to meet consumer demand for yearround availability.
- b) Apples and pears: Some Mediterranean countries imported apples and pears from countries with opposite growing seasons to ensure a continuous supply.
- c) Berries: Berries such as blueberries and raspberries were imported to supplement domestic production and meet consumer demands.
- d) Other vegetables: Mediterranean countries imported certain vegetables such as carrots, onions, and potatoes to balance supply and demand and maintain a diverse product range.

It is important to note that export and import trends in the agricultural sector can change over time due to a variety of factors, including changing consumer preferences, climatic issues, economic fluctuations, and changes in international trade agreements.

## 1.3. Description of the three supply chains

According to D1.1 ("Report on the definition of supply chain systems and identification of clusters"), a food supply chain system with specific structure and objectives includes a set of





actors, activities, resources, and information throughout the production process. This system requires adapted institutional arrangements that define rules and agreements between actors along the supply chain. Accordingly, the MED-LINKS project covers three types of food supply chains in five Mediterranean countries, considering the different number of actors involved in the supply chain, the agreements reached between them, and the spatial flow of the goods exchanged. These three supply chains include:

- 1) Short Food Supply Chains (SFSCs),
- 2) Green Public Procurement (GPP),
- 3) and Export-oriented supply chains (EOSC).

Short Food Supply Chains (SFSCs) are supply chains consisting of a limited number of economic operators and small farmers to meet the demand for local, high quality and sustainable agricultural products. The very purpose of this chain is to collaborate, develop local economies, and build close geographic-social relationships between producers, processors, and consumers.

Direct sales by individuals, collective direct sales, and partnership initiatives can be considered as types of SFSCs (European Parliament, 2016). Direct sales are direct transactions between farmers and consumers on the farm (as farmers' markets) or off the farm (home delivery to consumers through basket or box systems). Direct sales can also include online purchases. Collective direct sales refer to producers selling their products to a group of consumers or individuals. This type of sale typically takes place on the farm, in local stores, at local food festivals or fairs. Partnership initiatives of SFSCs take the form of a written agreement between partners that may include various forms of community supported agriculture.

Green public procurement (GPP) is the process by which public authorities seek to procure goods, services, and works that have a lower environmental impact throughout their life cycle than goods, services, and works with the same primary function that would otherwise be procured (European Commission, n.d.). GPP is the process by which public organizations operate to meet their needs for goods, services, and works in a way that achieves value for money throughout the life cycle, which could mean that benefits accrue to the organization, society, and the economy while reducing negative impacts on the environment. The idea aims to encourage government agencies to reduce the environmental impact of their many public purchases. GPP's main concerns can be summarized in these five pillars: Local Enterprise Capacity, Climate, Environment, Health and Value for Money.

GPP can sometimes be considered SFSC and specific local contexts, so that farmers sell their products directly to the community catering of public institutions (UNIDO, 2020). GPP participates in the active supply chain system in the production, processing, distribution, and retail sectors, as well as with institutional actors and organizations that provide certification. A communication and cooperation system between local-regional organizations that buy food and





local authorities and governments. On this basis, GPP requires certificates or clear criteria to approve products and services in the public procurement process (European Commission, n.d.).

Export-oriented supply chains (EOSC) refer to the international supply chain that relies on standards because various international companies operate and trade in it (Maertens et al., 2012). The actors in this supply chain are mainly coordinated small producers, international logistics, export agents, and certification bodies. The standards in the case of sustainability are mainly related to environmental and social issues such as working conditions (Meemken et al., 2021).

Short Food Supply Chain	<ul> <li>Actors: Local producers, Limited number of intermediaries, Organised consumers' networks, Producer associations.</li> <li>Institutional arrangements: Direct selling to consumers (e.g. farmers' markets) and to intermediaries (e.g. local shops).</li> <li>Geographical area: Local.</li> </ul>
Green Public Procurement	<ul> <li>Actors: Regional producers, Municipalities, Regional governments, Certification bodies.</li> <li>Institutional arrangements: Tendering, horizontal coordination.</li> <li>Geographical area: Regional/National.</li> </ul>
Export Oriented Supply Chain	<ul> <li>Actors: Coordinated small-scale producers, International logistics, Export agents, certification bodies.</li> <li>Institutional arrangements: Label based contracts, horizontal &amp; vertical coordination.</li> <li>Geographical area: International.</li> </ul>

Figure 2. three types of F&V supply chains (actors, institutional arrangements, and geographical area)

## 1.4. Sustainability and related certifications/standards

With the increasing awareness of environmental and social problems caused by agricultural production, new patterns are emerging in various agricultural fields such as production, distribution and consumption. One of the necessary actions towards sustainable development is to raise consumer awareness with the aim of changing consumption behavior in favor of the environment and achieving positive economic, social and health outcomes through sustainability labels (Aprile et al., 2012; Engels et al., 2010). To this end, various labels and certifications are currently offered to meet consumer sustainable concerns. Meanwhile, when information is passed from producers to consumers, appropriate labels or certificates can play an important role in conveying and confirming the desired information (Sirieix et al., 2013). Providing additional information about the details of the particular food standard can influence





consumer perceptions. For example, in an experiment with widely recognized organic labels, Hoogland et al. (2007) found that additional information increased the perceived value of orgasnic products. This is because if the interaction between the label and the details is not established, consumers may not properly perceive the value of the product.

Labels also known as eco-label, environmental label, and sustainability certificate (Sustain, 2019). These food labels are voluntary and can be managed and made available to consumers by private or public organizations and economic institutions such as nongovernmental organizations, government agencies, and policy makers. Organizations that provide information about the food produced and the production process (Ipsos, 2013). They usually take the form of a logo or statement on the product and emphasize compliance with standards. These logos usually refer to production in a specific region or are produced organically, take into account the local economy or poverty alleviation, and are even involved in the process of animal-friendly production (Ipsos, 2013). These labels reduce asymmetric information, lead to market transparency, and ultimately instill trust in consumers so they feel confident in their daily food decisions (Ipsos, 2013). In addition, Liu et al. (2019) points out that the presence of these labels on food products can be important as an advertisement for a marketing strategy, as it helps small producers overcome financial hurdles and helps private and public producers.

Regarding existing certifications and labels in supply chains, according to the deliverable D2.1 ("Review and analysis of existing sustainability standards and systems within the three supply chain systems"), the diversity of certifications in SFSCs and in each country is greater than that of EOSC. In Egypt, there is Economy of Love (EOL) and Demeter PGS, both of which share commonalities as they are based on a similar philosophy that describes the whole farm as an organization. However, they differ significantly in detail and complexity. France has agriculture biologique (AB), appellation d'Origine Protégée (AOP), label rouge. Greece has traditional specialties guaranteed (TSG), organic products, we do local. Italy has organic products, ISO22000 and AIAB Italian guarantee. Morocco has Les systems participatifs de garantie (SPG), Saveurs du Maroc and Halal Morocco.

A different approach was taken in characterizing GPP schemes, as they are governed by legal frameworks that determine the behaviour of public entities when they act as customers. Three countries, France, Italy and Greece, have similar policies. There is good progress in this area in Morocco, but they are not yet available in Egypt. Furthermore, the analysis of the systems and certificates in the five countries showed that several important standards are used in the EOSC of all five countries, such as EU-Bio, Fair-Trade International, Global GAP, and ISO22000. The number of certificates and standards that exist in export-oriented supply chains is higher than in short food supply chains.







## 2. Methodology-Data collection and elaboration

To investigate consumer appreciation and willingness to pay, a multi-method approach was used.

- 1. As a first step, Focus Groups (FGs) were conducted in each project country to identify consumer attitudes and preferences (qualitative analysis).
- 2. The results were used to develop a structured questionnaire (web-administered) structured questionnaire to compare the main attributes preferred by consumers and their willingness to pay for these attributes in the selected markets (quantitative analysis).

## 2.1. Qualitative analysis

In the qualitative research phase, based on the literature review, a focus group discussion guide was designed (Annex). This discussion guide, which includes 5 sections (Dietary habits in F&V, Preferences towards F&V consumption, Access/Purchasing behaviors, F&V sustainability and certifications/standards, and Willingness to pay for F&V certifications), was designed separately for all three supply chains (SFSCs, GPP, and EOSC). We used several questioning techniques, including closed-ended questions, "think back" questions, laddering technique questions, and word association technique questions (in which subjects were presented with a target stimulus and asked to name the first thoughts or images that come to mind).

The first part dealt with dietary habits in F&V. In this section, topics related to favorite F&V, the importance of eating F&V as a daily meal, the benefits of eating F&V, and its seasonality were discussed. The second section was about food and food consumption preferences. What characteristics do consumers look for when choosing F&V? The third section focused on access and purchasing behavior. In which supply chain do consumers purchase their F&V? How do consumers judge the prices of these products in the relevant places? The most important question related to F&V sustainability and certifications/standards was asked in the fourth section. Certifications and standards that consumers rely on or look for when buying F&V, what information they look for in the relevant certifications, and how familiar they are with sustainability certifications. At the end of this section, two types of certifications were discussed: socioeconomic and environmental. The last part examines consumers' willingness to pay for F&V certifications.

The parts of the questionnaire were shared with the partners and after their comments the final version of the questionnaire was designed. A comprehensive protocol was also required for the successful implementation of FG. This protocol was prepared according to the common standards of a FG (Annex), which outlines the objective of conducting the FG, the number of participants to be invited in each FG and their characteristics, the way of presenting the discussion topics, and the duration of the discussion that may take.

In addition to the FG, the necessary files for the direct survey (DS) were also provided (Annex). Also, some cards were provided as a guide to start the discussion with the FG /DS respondents to facilitate the reporting of the results (Annex). These cards correspond to the questions in the







questionnaire (Figure 3). As a result of using these cards, a template was created for the interview report.

#### 1.4. Benefits of F&V are:

- a) Giving more vitamins and minerals.
- b) Helping to cut down calories.
- c) Helping to improve body's digestive system.
- d) Reducing the risk of getting cancer.
- e) Helping to look better in appearance (e.g. skin condition).
- f) Other (to be specified)...

#### Figure 3. An example of a card provided for one of the discussions questions

## 2.2. Quantitative analysis

#### a) Data collection

Data were collected online in June 2023 via Qualtrics, an online survey platform. Consumer panel participants were recruited in collaboration with a market research firm (Toluna) via a crossnational online panel survey in France, Greece, Italy, Egypt, and Morocco. Gender, age, and education level quotas were set to be representative of the target countries' populations. It is difficult to claim that the sample in almost any online survey is representative of the population, since respondents who use the Internet tend to be younger and have higher levels of education than the population as a whole. We asked Toluna to create a "balanced sample" that reflected the national population as much as possible. The questionnaire was developed in English and then translated into the official languages of each target country and was available in early June 2023.

Initially, the survey was conducted as a preliminary test or soft launch with approximately 100 completed questionnaires, and after minor errors were corrected, the final lunch was conducted. The average time to complete the questionnaire was reported to be 15 to 20 minutes. The number of participants in the final evaluation was as follows:

chains					
Supply Chains/Country	Italy	France	Greece	Egypt	Morocco
SFSCs	311	270	344	226	239
EOSC	217	314	217	-	-
GPP	228	306	-	-	-
Total = 2.672	756	890	561	226	239

Table 1. The number of	participants in each target	country according to the	three supply
chains			

#### b) Survey design

The structure of the questionnaire included multiple-choice questions, Likert matrix questions with some items each, and some open-ended questions. A seven-point Likert scale was used in this study. 7-point scales correlate more strongly with observed significance levels than 5-point







scales and were reported by respondents to be the most accurate and easiest to use (Lozano et al., 2008; Preston & Colman, 2000). Responses referred to the Likert scale for measuring agreement, which was indicated as "strongly disagree" to "strongly agree".

The first and second block of screening questions included socio-demographics (gender, age, education level, and number of children in the family), and filter questions.

There were six filter questions as follows:

- are the participants in their household the main decision makers regarding the purchase of fruits and vegetables? (Participants selecting "No, I am not" are excluded from the survey).
- How often do they purchase F&V? (Participants who purchase less than once a week/never are excluded from the survey).
- Do they have children who eat F&V in public school canteens? (To filter respondents into GPP; if they answered yes, they will be included in the GPP quota).
- Are they a college student who regularly eats F&V in a public university canteen? (To filter respondents into GPP; if they answered yes, they will be transferred into the GPP quota).
- Where do they most often buy F&V? (To filter respondents in SFSCs and EOSC)
- Where do the F&V you buy most often come from? (To filter respondents in SFSCs and EOSC)

\* For the last two questions, if participants chose the local market and online + local products and/or national products options, they were assigned to the SFSC quota; otherwise, they were assigned to the EOSC quota (grocery/store choices and imported products and/or national products).

In the following, the questionnaire was further divided into sections:

- Dietary habits in F&V, including questions about F&V consumption habits and consumers F&V consumption intentions.
- Dietary preferences in F&V, including questions about F&V consumption benefits, these products choice criteria, and related consumption risks.
- Price consciousness scales, including questions about consumers' attention to special offers and such possible discounts when buying F&V.
- F&V related voluntary sustainability standards, including questions about trust and satisfaction level of existing certificates and information that consumers are looking for in the certificates.
- Familiarity with the concept of sustainability and related certification, focusing on socio-economic and environmental topics.
- Information on both socio-economic and environmental topics that are important to consumers as well as their feel about these certifications.
- Consumers' willingness to pay for each of suggested socio-economic and environmental certifications.







Among the questions, some control questions were also asked to check the quality of the questionnaire.

#### c) Data analysis

The Statical Package for the Social Science (SPSS version 27) was used to analyse the data. First, the relevant statistics (mode and standard deviation) were used to describe the variables. In the cluster analysis section, respondents were segmented using a combination of Principal Component Analysis (PCA) with Varimax rotation and Kaiser normalisation and Cluster analysis. The PCA analysis items with a factor loading below 0.40 commonality (Yeo et al., 2020) and an eigenvalue lower than or equal to 1 were excluded. The internal reliability of each factor was assessed by Cronbach's alpha (Cronbach, 1951).

After identifying orthogonal factors, cluster analysis was used to identify market segments based on the adapted food-related lifestyle (FRL) consumer instrument. Hierarchical cluster analysis with Ward linkage by FRL factor value were performed for the consumer segments. For ordinal Likert-scale data, the use of the hierarchical clustering method is more appropriate and can provide meaningful insights into the cluster structure of the data (Ref.). Hierarchical clustering creates a tree-like structure of clusters, called a dendrogram, by iteratively merging or splitting clusters based on similarity or distance measures. This method is better suited for ordinal Likertscale data because it does not rely on the assumption of continuous data or the use of mean values. Instead, it uses appropriate similarity or distance measures that are appropriate for ordinal data. Bartlett's Test of Sphericity (Bartlett, 1954) achieved statistical significance, supporting the factorization of the correlation matrix.







## 3. Results of Qualitative Analysis

## 3.1. Short food supply chains (EG, GR, IT, MO)

The planned FGs and DS were conducted in the five target countries, as described in Figure 4. There were three FGs in the Egyptian SFSCs, including two FGs in the first and the second mainstream and one FG in the niche SFSCs. We considered street vendors as the first mainstream, supermarkets as the second mainstream, and Rdna consumers as the niche market. Rdna is a specialty grocery store that means 'our land' and supports local farmers and producers by giving them a platform to sell their products to consumers in-store or online. 9 participants (3 men and 6 women) attended the first FG (street vendors), 9 participants (4 men and 5 women) attended the second FG (supermarket), and 6 participants (2 men and 4 women) attended the third FG (Rdna consumers). Figure 5 shows participants in one of the FGs in Egypt. Consumers had the opportunity to talk about the topics given in the discussion guide.



#### Figure 4. Classification of the implemented focus groups in target countries



Figure 5. Egyptian participants in the SFSC focus group



The PRIMA programme is an Art. 185 initiative supported and founded under Horizon 2020, the European Union's Framework Programme for Research and Innovation



Similarly, three FGs were conducted in Greek SFSCs, including two FGs in the first and second mainstream and one FG in the niche SFSC. These three FGs included farmers' markets in Thessaloniki (the first and second mainstream) and a farmers' market on the University campus (niche market). The first two FGs were held in Thessaloniki for convenience, in the stone building of University Farm of Aristotle University of Thessaloniki. The third FG was also conducted in Thessaloniki, at Aristotle University of Thessaloniki, with consumers buying F&V at the farmers' market (niche market) that takes place on the campus of Aristotle University of Thessaloniki. There were 8 participants attended each FG with an age group of 23 and 65 years, with a medium to high level of education.

The first FG lasted one and a half hours, the second about two hours and the third lasted one hour and 15 minutes. The interview guide was first translated into Greek. Two experts conducted the interviews in all three FGs. At the end, the results were reviewed by two experts. The results of the discussions were prepared (and translated into English) according to the suggested cards in the report template.

In the Italian SFSCs, two FGs were considered. One as mainstream and the other as niche SFSCs. The mainstream FG (supermarket shoppers) was conducted at the Camapgna Amica Foundation in Rome (Figure 6). 8 participants in the age group of 20 to 50 years participated. 8 participants consisting of married and single people and those who have children participated.

In another FG as a niche market, 2 men and 6 women in the age group of 25 to 64 years participated.



Figure 6. The presence of participants in the FG conducted in Italy

A FG in the mainstream was also introduced in Morocco as the second African country. The FG consists of 10 people, 5 women and 5 men. They ranged in age from 22 to 60 years old. They had a wide range of incomes from low to medium to high. Participants also had different levels of education, from elementary school to university. The FG was organized at home and the interviews were conducted and recorded in Arabic dialect so that the report could be written conveniently.

At the beginning of the FG conducted on SFSCs, participants were asked about their favourite F&V and how important eating them as part of their daily meal was to them. Apples, oranges,







strawberries, cherries, etc. were among consumers' favourite fruits, and tomatoes, potatoes, cucumbers, carrots, etc. were among their favourite vegetables (Figure 7).



Figure 7. SFSCs consumers' favored F&V in target countries

Then, participants were asked about the importance of eating F&V as part of their daily diet in five levels from not important to very important. The results showed that almost most participants were aware of the importance of consuming F&V as part of their daily diet. About 70% of participants surveyed in Egypt and Greece considered it "important" or "very important". Moroccan participants also had similar views. In Italy, participants rated the importance of F&V consumption more than in other countries, with about 80% of them considering daily consumption very important. Thus, this perception of the importance of F&V consumption can be inferred from the frequency of F&V consumption. About 60% of the participants in the FGs held in Italy indicated that they preferred to eat F&V every day, which was a higher frequency compared to other countries (Egypt, Greece, and Morocco).

Perceived importance of F&V benefits was discussed in detail among the participants. Five benefits were central to the discussions, including: more vitamins and minerals, fewer calories, better digestive system, lower cancer risk, and better appearance (Figure 8). Two options, namely the intake of more vitamins and minerals and the improvement of the digestive system, were perceived as the greatest benefits of the consumption of F&V among the FG, implemented in the target countries. However, the two options of reducing cancer risk and reducing calorie consumption were perceived as the least benefits of consuming F& by participants in the target countries. The option of helping to look better in appearance was also perceived as the least benefit of F&V consumption in Greece.









The next discussion was about the concept of seasonality. Participants were asked about the season in which they typically consume the most F&V as well as the reason for choosing that season. Participants chose the summer season as the season when they consume the most F&V, but some of them mentioned that they usually consume F&V throughout the year. Five reasons were mentioned, including availability of the desired F&V, reasonable or even cheaper price in that season, freshness (full of flavor and nutrients), nicer appearance, and better environmental impact (Figure 9). As for the environment, eating seasonally reduces demand for out-of-season produce, which further supports more local produce and supports local farming in your area, which means less transportation, less refrigeration, less hot houses, and less irradiation of produce. The main reasons for choosing the desired season were availability, freshness of F&V, and other appearance characteristics such as appearing much brighter and plumper than non-seasonal produce. In addition, environmental reasons and reasonable prices were the next priorities. When comparing the environmentally friendly aspect, the participants from Italy and Greece paid more attention to it, while the Egyptian participants paid less attention to this reason. The availability of F&V was the main focus for the Egyptian participants.









# Figure 9. The reason for choosing favourite season by SFSCs consumers (Percentage of chose options by consumers)

The topic of the next discussion was F&V consumption preferences or, in other words, the characteristics that consumers look for when choosing F&V. First, participants were presented with some options (on the cards provided) as suggestions and were asked to mention if there was another characteristic that interested them. The results of the characteristics mentioned were divided into three categories:

- 1. Intrinsic (or natural) quality features,
- 2. Extrinsic (or external) quality features,
- 3. Food safety features.

In terms of intrinsic (or natural) quality, characteristics such as freshness (fresh F&V means F&V that has not been processed in any way, or raw, uncut F&V), seasonality, nutritional content, taste and flavour, convenience (need to wash ready-to-eat F&V, shelf life), and appearance (color of F&V consumption) were discussed.

The results of features that consumers look for when choosing F&V is shown in Figure 10. Egyptian consumers paid more attention to freshness, taste, and appearance of F&V. In addition to freshness and taste, Italian consumers also paid attention to nutritional content and convenience when selecting F&V. Greek participants paid attention to the same characteristics as Italians and Egyptians. They also considered seasonality of F&V as a characteristic they look for when buying these products.

For extrinsic (or external) quality attributes, the three characteristics of packaging, brand, and information were considered by participants in each FG. Packaging provides protection from chemical, biological, and physical changes. Brand, on the other hand, was considered a concept that helps people identify a particular company, product, or person. Egyptian and Greek consumers cared about F&V information and its packaging, while for Italian consumers, brand was important in addition to packaging.

In addition to quality attributes, food safety was one of the most important issues consumers look for when buying food. Genetically modified F&V (modification of plant genes through







genetic engineering), additives, chemicals released from F&V packing, pesticide residues (used during plant growth or production), and food poisoning (sometimes raw F&V may cause food poisoning from harmful germs) were mentioned by participants as food safety characteristics. Characteristics such as genetically modified F&V, additives, and pesticide residues were considered by Italian consumers as risk characteristics when choosing foods. For Greek and Egyptian consumers, in addition to additives and pesticide residues, food poisoning by harmful germs was the characteristic they look for when buying F&V. Among these five characteristics, the characteristic of chemicals released from packaging had a lower priority for participants in the target countries.



# Figure 10. Quality features that SFSCs consumers look for when choosing F&V (percentage of selected options, Egypt=79, Greece=160, and Italy=119)

The place or type of store where F&V is sold is another factor that could influence consumer preference for these products. There are three main markets for purchasing F&V. Local F&V growers, who typically sell produce on the farm, at farmers' markets or stores, at local food festivals or fairs, and at allotments. The next options were supermarkets or local grocery stores, which are also available as online stores. In addition, students in schools or universities can purchase these products in community food service facilities (e.g., school or university canteens, company canteens, hospitals, or stores).







Consumers in the focus group in all four countries, Egypt, Greece, Italy, and Morocco, preferred to purchase F&V from local F&V producers. The catering option was not popular among participants, and few Egyptian and Greek consumers were willing to use or purchase this option. Buying from supermarkets and buying or eating F&V from restaurants were the next priorities of consumers. Among Egyptian consumers, there was no clear difference between the local producer and the supermarket. Among Greek and Italian consumers, this difference was greater, so that about 85% of Italian consumers prefer buying from local producers to buying from supermarkets. The reason for this could be the importance that Italian consumers gave to local products. This is because when asked to choose between local and imported products, about 56% of Italian participants tended to buy local products. Italian consumers mentioned freshness, seasonality, nutritional content, and taste as reasons for preferring local F&V compared to imported products. Consumers in other countries consume not only local products but also imported products (about 50% of Greek consumers consume both local and imported products, as do about 54% of Egyptian consumers).

After discussing the characteristics consumers look for when choosing F&V, we discussed F&V sustainability and certifications/standards as the main goal of the project. Before we start, there was a discussion about the availability of certifications or standards when buying F&V and what certifications consumers are basically looking for.

According to the results, most Italian consumers had access to the relevant certificates at the time of purchasing F&V (about 85% of them said yes). In other countries, this access was less pronounced. Almost half of Greek consumers had access to certificates at the time of purchasing F&V, while in Egypt and Morocco access was lower.

The results of the question of what type of certifications or standards consumers were looking for are shown in Figure 11. Environmental standards like Biological EU/Organic EU, Global GAP or Global Grasp; socio-economic standards (Fair Trade and Support), food safety standards, ethical standards/Ethical norms, and geographical certification/standards were among the standards consumers look for when buying F&V.







Italy
<ul> <li>Environmental certification/standards (Biological EU/Organic EU, Global GAP or Global Grasp),</li> <li>Socio-economic certification/standards (Fair trade and support),</li> <li>Food safety certification/standards ,</li> <li>Ethical standard/Ethical norms,</li> <li>Geographical certification/standards .</li> </ul>
Greece
•Environmental certification/standards (organic certification), •Geographical certification/standards .
Egypt
<ul> <li>Food safety certification/standards,</li> <li>Socio-economic certification/standards,</li> <li>Environmental certification/standards,</li> <li>Ethical certification/standards,</li> <li>Geographical certification/standards.</li> </ul>
Morocco
•Environmental certification/standards.

## Figure 11. Certifications/standards that SFSCs consumers rely on/ do you seek for when buying F&V

To find out what information consumers look for in F&V certifications, participants were asked about this topic using the discussion guide. In general, they looked for 10 types of specific information in certificates, including ingredient list, expiration date, geographic origin, shelf life, the organic logo (certifies that no chemical additives or ingredients from genetically modified organisms were used during the production process), health logo or symbol (such as. "Good for you" or the Sunflower "Eat Well" logo), allergy information (foods responsible for most severe allergic reactions to food.), integrated pest management, environmentally friendly, and ethical or social (refers to the moral consequences of food choices, both human and animal).

A comparison of the information consumers in different countries look for in a certificate is shown in Figure 12. Geographic origin, best-before date, and organic logo were among the most common information among consumers, while allergy information, integrated pest management, and health logo were among the least common among consumers. Shelf-life date information was more important for Italian consumers. But for Greek and Egyptian consumers, geographic origin and the organic logo are more important.



ited and founded





Figure 12. Information that SFSCs consumers looking for in F&V certifications (Percentage of selected options)

In the following, we address the concept of sustainability and the certifications associated with it.

Sustainability consists of meeting the needs of the present generations without compromising the needs of future generations. For this purpose, a brief explanation was given to the participants about the concept of sustainability and its dimensions.

Commonly, sustainability has three dimensions environmental, economic, and social.

Environmental sustainability focuses on the conservation of the environment like safeguarding water, saving energy, reducing waste, etc.

Social and economic dimensions refer to strengthening the stability of social groups and managing resources and responsibly generating profits in the long term such as a system that aims to support working conditions, reduce world poverty, and create sustainable development.

Following these explanations, participants were asked about their familiarity with sustainability certification/perception. The results of the question, which can be answered with a twodimensional yes or no, showed that almost all participants were familiar with the general concept of sustainability. This familiarity was greater in Greece (87% of participants), Italy (75%) and Egypt (75%), while Moroccan participants were less familiar with this concept.

The parameters of the sustainability dimensions are evaluated below. In the form of questions on the word association technique (in which subjects are presented with a target stimulus and asked to name the first thoughts or images that come to mind), we asked about the first images, associations, thoughts, and feelings that come to mind for consumers.







The results of the discussion on FG in the case of "socio-economic certifications" showed that consumers' opinion on this dimension of sustainability was generally positive. A positive opinion was more observed among Italian participants. There were also very positive opinions about this type of certificate. Some people in Greece, Morocco and Italy answered that they were not familiar with socio-economic certifications. 45% of participants in the FG conducted in Egypt were not familiar with this term (Figure 13).



# Figure 13. "socio-economic certifications", first images, associations, thoughts, feelings that came to SFCs consumer mind

Then, this type of certificate was discussed in detail in the FGs, about the socioeconomic aspects of the certifications, which were usually important for consumers. At the beginning of the discussion, the cards presented seven options for the information that these certificates could contain (Figure 14).

#### **The socio-economic aspects of the certifications that usually matter to consumers:** Producers ...

- a) do not employ child labour,
- b) provide adequate working conditions and wages for workers (remuneration of employees),
- c) do not have poor treatment of animals in their production (animal welfare),
- d) observe fair trade (by purchasing these goods you are supporting a system that aims to reduce world poverty and create sustainable development),
- e) support local (my residence country) farmers, or recognize and give value to local and traditional knowledge, as well as endemic products of specific region,
- f) production process does not have any legal violations,
- g) ensure quality of products by certification and recognize for the consumer (respect to consumer rights).

# Figure 14. The socio-economic aspects of the certifications that usually matter to SFSCs consumers.

The results of the options that were important to the participants are shown in Figure 15. The results are presented as a percentage of the selected option. In general, in the groups conducted







in the four countries Italy, Greece, Egypt and Morocco, "supporting local farmers", "working conditions and wages" and "ensuring the quality of products" were the most important information for participants. In addition, certificates that include information such as "fair trade," "no rights violations," and "no poor treatment of animals" were less mentioned by consumers in the discussions.

The importance of this information varied across countries, so that for Italian and Egyptian participants, "working conditions and wages" and "support for local farmers" aspects of this certificate were the most important. For Greek consumers, on the other hand, "supporting local farmers" and "ensuring the quality of products" were the most important aspects of this certification.



Figure 15. Aspects of socio-economic are most important to SFSCs consumer (%).

The next dimension discussed is the environmental dimension of sustainability. Similar to the socio-economic aspect, the group participants were asked about the word "environmental certification" (first images, associations, thoughts, feelings that came to the consumers' mind). The results are show in Figure 16. What is remarkable about the comparison with the socioeconomic aspect is that consumers, were being more familiar with this dimension of sustainability, had a more positive and very positive opinion about it. However, few of them had a negative and very negative opinion about this dimension.









### Figure 16. "Environmental certifications", first images, associations, thoughts, feelings that came to SFSCs consumer mind

Next, the environmental dimension and related information were discussed at FG. As with the previous dimension, the information that could be included in this type of certificate was presented to the participants in the form of cards (Figure 17).

## The environmental aspects of the certifications that usually matter to consumers:

Producers ...

- a) production process has not led to deforestation,
- b) do not use too much of the world's natural resources for their production,
- c) do not use packaging that is not recyclable,
- d) do not emit carbon emissions caused by their production,
- e) using less energy in the transportation/ processing of them (e.g., through energy savings),
- f) promote the diversity of plants in their production environment,
- g) produce the plants in a soil-protecting process,
- h) use fewer pesticides/fertilizers in their production or use biological ones,
- i) use beneficial insects in their production,
- grow their plants in a peat-reduced substrate (plant soil), j)
- k) use water sparingly in their production and processing,

## Figure 17. The environmental aspects of the certifications that usually matter to SFCS consumers

Figure 18 presents the results in comparative form for different countries. In general, information such as "use less pesticides/fertilizers," "use less natural resources," and "do not use non-recyclable packaging" were more important to participants than other information in this type of certificate. However, information such as "peat-reduced substrate planting," "use beneficial insects," and "reduce carbon emissions" were less important to them.









Figure 18. Aspects of environmental are matter to SFSCs consumer (%).

At the end of the discussion, participants were asked how much they were willing to pay for two certificates related to the socioeconomic and environmental dimensions of sustainability (a percentage of the F&V price without certification). Consumers were asked about their willingness to pay in the form of two answers: yes and no. If they answered yes, they were asked about their willingness. For a better comparison, the willingness-to-pay results for each certificate and separately for each country are presented in Figure 19.

The results showed that willingness to pay for environmental certification was higher than for socioeconomic certification in the countries. 75% of Egyptian participants were willing to pay for environmental certification, while 58% of them were willing to pay for socioeconomic certification. In Greece, this ratio was also 54% to 46%. The results of the Italian participants showed a high willingness to pay for sustainability certification (93% for environmental certification and 75% for socio-economic responsibility certification).

The results of the comparison of willingness to pay for two suggested certification for F&V also showed that consumers were more willing to pay for booth socio-economic and environmental certificates for fruits than for vegetables. Of course, this amount is higher for the environmental certificate than for the socioeconomic certification.






Egyptian participants were willing to pay 25% of the fruit price for environmental certification. For the socioeconomic certificate, this amount was 22%. They were also willing to pay 21% for vegetables with environmental certification, while they were more likely to pay 10% for vegetables with socioeconomic certification. The willingness to pay in Greece was almost the same as in Egypt. 21% willingness to pay for fruits with environmental certification compared to 16% willingness to pay for fruits with socioeconomic certification. For vegetables with environmental and socioeconomic certification, these values were 20% and 15%, respectively. However, this amount was less reported by Italian participants, but the willingness to pay for both environmental and socioeconomic certification was almost the same. It is interesting to note that Italian consumers were more willing to pay more for this type of certification for vegetables than for fruits (6% for fruits with environmental and socioeconomic certification was almost the same. It is interesting to note that Italian consumers were more willing to pay more for this type of certification for vegetables than for fruits (6% for fruits with environmental and socioeconomic certification yet by the same certification for vegetables).









Figure 19. SFSCs consumers' willingness to pay for the certifications that provide information on environmental and socio-economic aspects (percentage of F&V price)

### **CONCLUSION BOX: SFSCs consumers**







- 1. Providing more vitamins, improving the digestive system, and better appearance were perceived the top three benefits of F&V consumption.
- 2. Availability, freshness, and appearance were the main reasons that consumers chose the preferred season in which they typically consume the most F&V.
- 3. Freshness, taste, and appearance were the most important natural quality features that consumers look for when selecting F&V.
- 4. Residues of pesticides, additives, and genetically modified F&V were the most important food safety features that consumers look for when selecting F&V.
- 5. Geographic origin, date of durability or shelf life, and organic logo were the top three pieces of information consumers look for when selecting F&V.
- 6. Working conditions, supporting local farmers, and ensuring the quality of products were the most important socioeconomic aspects of certifications that tend to be important to consumers.
- 7. Using fewer pesticides, using fewer natural resources, and not using non-recyclable packaging were the most important environmental aspects of the certifications that were generally important to consumers.
- 8. Countries' willingness to pay for environmental certifications was higher than for socioeconomic certifications.
- 9. Consumers were more willing to pay for socioeconomic and environmental certifications for fruits than for vegetables.
- 10. Price premium value was higher for the environmental certificate than for the socioeconomic certification.

# 3.2. Green Public Procurement (FR)

Regarding GPP, two DS were implemented in both the first mainstream and niche GPP in France (Figure 20). The direct survey in the first mainstream GPP was conducted through face-to-face interviews with 9 students eating in the University Canteen. In addition, DS in the niche GPP were done by using an online questionnaire. There were 5 participants who ate at the IAMM Canteen run by a local organization called "Le Passe Muraille". This is a small organization that works to promote local traditions and heritage (preservation of buildings, landscapes, etc.). It also serves about 250 meals a day in 3 canteens in Montpellier, locally and organically produced (as much as possible).



Figure 20. Conducted direct survey in GPP



The discussion structure is as for the SFSCs. First, respondents were asked about their preferred F&V products, the importance of consuming F&V products as part of their daily diet, and the frequency of consumption of these products.

The results showed that apple, avocado, banana, clementine, grape, kiwi, peach, pear, pineapple and strawberries were among consumers' favourite fruits, as were broccoli, carrots, cauliflower, cucumber, potato and tomato among their favorite vegetables. As for the importance of eating F&V as part of their daily diet, 57% of respondents considered it important and 21% consider it very important. The frequency of consumption of F&V was high, so that about 36% of students consume F&V daily, and 57% of them consume these products frequently.

Then, respondents were asked about the perceived importance of F&V benefits. The results in Figure 21 showed that five benefits-more vitamins (28% of respondents chose this option), help improve the digestive system (23%), reduce cancer risk (21%), help improve appearance (15%), and help reduce calories (13%)-were perceived as the most important benefits of fruit consumption.



Figure 21. GPP consumers' perceived importance of the F&V benefits (Percentage of chose options by consumers)

\* Consumers could choose more than one option.

In terms of seasonality, summer was considered the season when consumers prefer to use F&V products throughout the year. The reasons for this were five factors, namely the availability of F&V, its freshness, seasonal consumption for environmental reasons, the favourable price of F&V, and its appearance (Figure 22).









Figure 22. The reason for choosing favourite season in GPP (Percentage of chose options by consumers)

Among the characteristics GPP consumers look for when choosing F&V, freshness, taste and flavor, and seasonality were the most common, and the three factors of chemicals released from packaging, nutrient content, and genetically modified F&V were less important to consumers (Figure 23).



Figure 23. Quality features that GPP consumers look for when choosing F&V

Following the survey of consumers' F&V preferences, questions were asked regarding the availability of certifications/standards at the time of F&V purchase. Half of the respondents found the certificates available at the time of purchase, while the other half did not have them in hand. The certificates consumers rely on or look for when purchasing F&V were Agriculture

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Biologique, Organic EU, AB (Organic Agriculture), FAIRTRADE, Geographical Standards, Label Rouge, IGP, Nature et Progrès, AOP, AOC.

Regarding the information GPP consumers look for in F&V certifications, students looked for information on ethical/social aspects, the organic logo, and geographic origin. They also looked for information such as shelf life, expiration date, environmentally friendly production, and ingredient list (Figure 24).



Figure 24. Information that GPP consumers looking for in F&V certifications (N=35)

Next, in order to check their preference for sustainability certification and their willingness to pay for it, students were first asked about their level of awareness or familiarity with the concept of sustainability certification. About 57% were familiar with this type of certification and about 43% were not familiar with it.

To further discuss the dimensions of sustainability certifications, consumers' perceptions, associations, thoughts, and feelings about "socioeconomic certifications" were first asked. About 64% of the students had a positive attitude towards it, while about 21% were not familiar with this type of certification. Among the socio-economic aspects, the aspects of no child labor, support of local farmers, and proper working conditions were the most important to consumers. The three aspects no poor treatment of animals in production, ensuring the quality of products through certification and compliance with fair trade are less important to them (Figure 25).







Figure 25. Aspects of socio-economic are most important to GPP consumers

Compared to "socioeconomic certifications," consumer opinion of "environmental certifications" was more positive. About 71% had a positive attitude towards it, and about 21% had a very positive attitude towards it. In addition, all students asked were familiar with this dimension of sustainability certification.

Among the environmental aspects that were important to GPP consumers, the use of fewer pesticides in F&V production, no deforestation due to the production of these products, and the use of recyclable packaging were most important to consumers. However, the three aspects of no carbon emissions, use of beneficial insects, and growing plants in a peat-reduced substrate were least important to them (Figure 26).



Figure 26. Aspects of environmental are matter to GPP consumers



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At the end of the interview, regarding consumers' preferred F&V products, they were asked about their willingness to pay for certifications that provide information on environmental and socioeconomic aspects. Students' willingness to pay for additional information on environmental aspects was higher than for socioeconomic aspects. 50% of them agreed and 50% disagreed that they were willing to pay for certification with environmental information. While only 36% of them had the desire to pay for F&V with a socio-economic certificate (Figure 27). The average price premium for fruit with environmental certification was 8% higher than the price of the same fruit without certification. For fruits with socioeconomic certification, this value was lower and is 7%. For vegetables with an environmental certificate this value was 10% and for vegetables with a social certificate it was 5%.



Figure 27. GPP consumers' willingness to pay for the certifications that provide information on environmental and socio-economic aspects (percentage of F&V price)

# **CONCLUSION BOX: GPP consumers**

- 1. Providing more vitamins, improving the digestive system, and reducing the risk of getting cancer were perceived the top three benefits of F&V consumption.
- 2. Availability, freshness, and environmentally-friendly were the main reasons that consumers chose the preferred season in which they typically consume the most F&V.
- 3. Freshness, taste, and seasonality were the most important natural quality features that consumers look for when selecting F&V.
- 4. Additives, residues of pesticides, and chemical released from packing were the most important food safety features that consumers look for when selecting F&V.
- 5. Ethical/social aspects information, organic logo, and geographical origin were the top three pieces of information consumers look for when selecting F&V.
- 6. Do not employ child labour, supporting local farmers, and providing adequate working condition were the most important socioeconomic aspects of certifications that tend to be important to consumers.
- 7. Using fewer pesticides, production process has not led to deforestation, and not using non-recyclable packaging were the most important environmental aspects of the certifications that were generally important to consumers.







- 8. Countries' willingness to pay for environmental certifications was higher than for socioeconomic certifications.
- 9. Consumers were more willing to pay for socioeconomic certifications for fruits than for vegetables and for vegetables that fruit for environmental certifications.
- 10. Price premium value was higher for the environmental certificate than for the socioeconomic certification.

# 3.3. Export-Oriented Supply Chains (FR, IT)

In addition to GPP, two DS were implemented in the first mainstream and in the niche EOSC in France (Figure 28). The DS in the first EOSC mainstream interviews were conducted using an online questionnaire. The number of participants in this interview was 10. As with the first EOSC mainstream, the DS in the EOSC niche were also interviewed using an online questionnaire. 35 participants who buy F&V from "Les Jardins de Bentenac". This is a small organization that sells F&V grown on its own land, but also offers imported products from other countries.

A mainstream EOSC was also conducted in Italy as FG. 9 participants (6 women and 3 men) with different age groups from 25 to 64 years and different professions (including teachers, government employees, financial advisors and housewives) participated. The discussions were conducted in Italian, and after the FG, the results of the discussion were prepared in the form of a prefabricated template in English.



Figure 28. Classification of direct survey and focus groups conducted in EOSC

The topic of discussion is similar to two SFSCs and GPP supply chains. First, respondents were asked about their perception of the importance of F&V consumption, their preferences and factors influencing their F&V consumption or purchase preferences, the topic of certificates, their accessibility, the concept of sustainability, and also the information they seek for both dimensions of sustainability certification, including socioeconomic and environmental certifications.

The results from Italian and French consumers, who mainly consume these products on a daily basis, show that they considered the benefits of F&V important because they provide more vitamins, improve the digestive system, reduce the risk of cancer, save calories and improve appearance (Figure 29).







Figure 29. Perceived importance of the F&V benefits (Percentage of chosen options by EOSC consumers, \* Consumers could choose more than one option)

Summer is the season when most F&V was eaten (about 48% chose summer and 30% all year round). The reasons for this were the availability of fruits and vegetables, freshness, low price, and the brighter and plumper appearance of seasonal F&V.

Among the characteristics consumers look for when selecting F&V, seasonality, freshness, and taste were the most common natural quality characteristics EOSC consumers look for when selecting food and feed. F&V claims/information were also important to them as an external quality attribute. In terms of food safety, pesticide residues, food poisoning and additives were the most frequently cited criteria (Figure 30).



Figure 30. Quality features that EOSC consumers look for when choosing F&V



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(Percentage of chosen options by consumers) \* Consumers could choose more than one option)

After exploring consumer preferences, they asked about the availability of certifications/standards at the time of F&V purchase in the EOSC. Nearly 80% of French consumers found F&V certifications and standards available in EOSC, as well as almost all participants in the Italian FG. Among the certifications/standards that French and Italian consumers relied on or looked for when buying F&V, we can mention AB, AOP, AOC, Label Rouge, Fairtrade, IGP, PDO, Agriculture Biologique, EU organic, Fairtrade International, Protected Geographic Indication, Haute Valeur environnementale and Nature et Progrès.

Regarding the information that EOSC consumers looked for in F&V certifications, both Italian and French consumers paid attention to the geographical origin in this supply chain. Next, the best before date was important for Italian consumers, while the organic logo and the ethical/social aspect were important for French consumers. In addition, allergy information, health logo and shelf life were information that were not important for both consumers in this type of supply chain (Figure 31).



Figure 31. Information that EOSC consumers looking for in F&V certifications (Percentage of selected options)

Before starting the discussion on the different dimensions of sustainability certificates, the participants were asked about the level of general familiarity with the sustainability certificate. Although almost all Italian participants were familiar with the concept of sustainability certification, about 40% of French participants did not know this concept.

Then, the dimensions of sustainability certificates were asked, first the socio-economic certificate and the first images, associations, thoughts and feelings that came to the mind of the EOSC consumers. The mental image of most Italian participants was positive and very positive (56% positive and 44% very positive). However, besides the positive image that the French respondents had of this certificate, there were also about 30% of those who did not know this type of certificate (Figure 32).









After assessing consumers' feelings about the socioeconomic certifications, their aspects were explained to them, and they were asked to answer which aspects were most important to them.

"Child labor," "Working conditions and wages", "No poor treatment of animals", and "Support of local farmers" were among the most important aspects of socioeconomics for EOSC consumers. However, "legal violations", "Ensuring product quality through certification" and "Fair trade", on the other hand, were less important to them (Figure *33*).



Figure 33. Aspects of socio-economic are most important to EOSC consumer (percentage from selected options).

Similar to "socioeconomic" certification, EOSC consumers were asked about their feelings toward "environmental" certification. Although more than half of French and Italian respondents had positive and very positive feelings toward this certification, in contrast to







socioeconomic certification, which about 30% of French participants were unfamiliar with, about 44% of Italian participants were familiar with environmental certification (Figure 34).



Figure 34. "environmental certifications", first images, associations, thoughts, feelings that came to EOSC consumer mind

Regarding the environmental aspects that are important to consumers, "use less pesticides/fertilizers in F&V production", "avoid deforestation in production", "do not use non-recyclable packaging", and "use beneficial insects" were four aspects that are most important to Italian consumers. In contrast, in addition to the importance of "using less pesticides/fertilizers in F&V production," "using less natural resources" and "avoiding deforestation in production" were also important to French consumers (Figure *35*).









# Figure 35. Aspects of environmental are matter to EOSC consumer (Frequency, percentage from selected options).

Regarding willingness to pay for F&V environmental and socioeconomic certifications, similar to both SFSCs and GPP supply chains, Italian and French consumers were willing to pay more for environmental certifications than for socioeconomic certifications. 80% of Italians were willing to pay a higher price for environmental certification than for socioeconomic certification, which is 65%. The average willingness to pay as a percentage of the price of F&V with environmental certification was 7% for fruits and 10% for vegetables. These values were lower for socioeconomic certification (5% for fruit and 7% for vegetables). Importantly, Italian consumers tent to pay more for vegetables than for fruit, as did French consumers. French consumers paid a higher pricepremium for F&V with environmental and social certification compared to Italian consumers. For example, they tended to pay 22% more for fruit and 30% more for vegetables with environmental certification. 13% for fruit and 24% for vegetables with socio-economic certificates (Figure 36).



Figure 36. Italian and France EOSC consumers' willingness to pay for the certifications that provide information on environmental and socio-economic aspects (percentage of F&V price)





#### **CONCLUSION BOX: EOSC consumers**

- 1. Providing more vitamins, improving the digestive system, and reducing the risk of getting cancer were perceived the top three benefits of F&V consumption.
- 2. Availability, freshness, and low price were the main reasons that consumers chose the preferred season in which they typically consume the most F&V.
- 3. Freshness, seasonality, and taste were the most important natural quality features that consumers look for when selecting F&V.
- 4. Residues of pesticides, food poisoning, and additives were the most important food safety features that consumers look for when selecting F&V.
- 5. Geographical origin, date of durability, and organic logo were the top three pieces of information consumers look for when selecting F&V.
- 6. Do not employ child labour, providing adequate working condition, and animal welfare were the most important socioeconomic aspects of certifications that tend to be important to consumers.
- 7. Using fewer pesticides, production process has not led to deforestation, and less use of natural resources were the most important environmental aspects of the certifications that were generally important to consumers.
- 8. Countries' willingness to pay for environmental certifications was higher than for socioeconomic certifications.
- 9. Consumers were more willing to pay for socioeconomic and environmental certifications for vegetables than fruit.
- 10. Price premium value was higher for the environmental certificate than for the socioeconomic certification.







# 4. Results of Quantitative Analysis

Results of quantitative analysis are presented separately for three supply chains SFSCs, GPP, and EOSC.

# 4.1. Short food supply chains (EG, FR, GR, IT, MO)

Demographic characteristics of participants in SFSCs are described in Table 2. According to the aims of the research, the target countries included five countries, Italy (311 participants), France (270 participants), Greece (344 participants), Egypt (226 participants) and Morocco (239 participants). The gender distribution was almost the same. In some countries, such as Italy and France, the number of female participants was more than the number of male participants, and in Greece, Egypt, and Morocco, the number of male participants was more than women. Most respondents fell in the 25-54 age group. The distribution of the level of education and the number of children in the family was different in the studied countries.

	Definitions	Italy	France	Greece	Egypt	Morocco
Condor	Male	45.3	45.6	54.1	50.0	57.3
Gender	Female	54.7	54.4	45.9	50.0	42.7
<b>A</b> = -	18-24	9.3	17.8	11.3	18.1	21.3
Age	25-54	48.6	38.9	51.7	72.1	61.9
(rears	55-64	26.4	24.8	29.1	7.5	14.6
010)	Over 65	15.8	18.5	7.8	2.2	2.1
	Elementary school	4.2	2.2	0.6	0.0	0.8
Education	High school	78.8	48.1	42.4	57.1	32.6
Education	University and/or	17.0	49.6	57.0	42.9	66.5
	above					
Children	0-5 years old	11.5	14.6	19.8	24.2	24.2
in family	6-10	15.1	11.6	15.5	26.9	24.2
(numbers/	11-13	16.6	12.5	15.9	18.2	17.8
years old)	over 13	56.8	61.3	48.8	30.7	33.7

# Table 2. Socio-demographic characteristics of the sample (%)

Number of participants: Italy=311, France=270, Greece=344, Egypt=226, Morocco=239.

According to one of the filter questions, the frequency of purchasing F&V by SFSCs consumers, participants who purchased F&V less than once a week were excluded from the survey. The results are shown in Figure 37. Compared to other countries, French and Greek participants were most likely to buy F&V at least once a week, while two African countries, Egypt and Morocco, had the highest frequency among consumers who bought F&V more than three or several times a week.







Figure 37. The frequency of purchasing F&V by SFSCs consumers (%).

Regarding consumers' perceptions of F&V benefits, the importance of five options was assessed. Table 3 shows the results of "mode" as a measure of central tendency indicating the most popular choice, "range" as a measure of variability, "standard deviation" as a measure of the amount of variation, and "Cronbach's alpha" as a measure of internal consistency reliability for a set of items or options. Cronbach's alpha results indicate good internal consistency in all 5 countries. In almost all countries, all five options were considered the most favourite choice. However, the percentages of choosing the desired option were different so that in all five countries, the option of having vitamins and minerals was considered the most important benefit of F&V from the consumer's perspective. After this option led to better in appearance option in Italy, and improvement of body's digestive system was most important benefit of the F&V in other countries of France, Greece, Egypt and Morocco.

	I1	taly		Fr	ance		Gr	reece		E	gypt		Mc	rocco	C
Options	Mode (%*)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Vitamins and minerals	7 (57.2)	6	0.91	7 (51.9)	6	1.03	7 (57.8)	4	0.73	7 (70.4)	6	0.81	7 (60.7)	6	1.05
Cut down calorie	7(36.0)	6	1.22	7 (38.9)	6	1.22	7 (40.4)	5	1.1	7 (53.1)	6	0.86	7 (31.8)	6	1.42
Body's digestive system	7 (38.6)	4	0.98	7 (46.7)	5	1.12	7 (50.3)	4	0.79	7 (66.8)	6	0.71	7 (48.1)	6	1.1
Reduces getting cancer	7 (36.3)	6	1.23	7 (34.8)	6	1.37	6 (34.0)	6	1.1	7 (61.5)	6	0.81	7 (42.3)	6	1.26
Better in appearance	7 (39.9)	5	1.04	7 (39.6)	6	1.16	7 (42.7)	5	0.97	7 (65.9)	4	0.67	7 (47.7)	6	1.13

\* 7-point Likert scale from 1: Strongly Disagree to 7: Strongly Agree; the number in the parentheses is the selection percentage of the desired option.

Number of participants: Italy=311, France=270, Greece=344, Egypt=226, Morocco=239.





Examined Cronbach α: Italy= 0.85, France= 0.86, Greece=0.83, Egypt= 0.73, Morocco=0.84.

Among the important F&V selection criteria, seasonality, freshness, and taste were the most three important selection criteria for Italian and Moroccan consumers. French consumers also mentioned these three criteria as the most important, but for them the F&V taste was most important, along with other factors. For Greek consumers, access to purchasing was important, in addition to freshness and seasonality. Furthermore, F&V nutrient content was an important factor from the perspective of Egyptian consumers, as was the freshness and seasonality.

	Italy France			ance		Gre	eece		E	gypt		Мс	oroco	:0	
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Freshness	7	6	1.16	7 (50.0)	5	1.08	7 (51.2)	6	0.88	7	4	0.78	7	6	1.21
	(50.2)									(56.2)			(51.0)		
Seasonality	7	6	1.01	7 (52.6)	6	1.11	7 (48.3)	5	0.83	7	5	0.79	7	6	1.08
	(53.4)									(55.8)			(44.4)		
Nutritional contents	6	6	1.08	7 (34.8)	6	1.23	7 (42.7)	4	0.86	7	3	0.72	7	6	1.06
	(35.0)									(56.2)			(39.3)		
Taste and flavor	7	6	1.06	7 (53.7)	6	1.01	7 (43.6)	5	0.87	7	2	0.63	7	6	0.99
	(46.0)									(54.4)			(42.7)		
Color and appearance	6	6	1.16	7 (31.9)	6	1.34	6 (39.8)	5	1.11	7	5	0.86	6	6	1.15
	(36.3)									(52.2)			(38.1)		
Access to buy	6	6	0.95	6 (33.3)	6	1.19	6 (44.5)	5	0.90	7	3	0.69	7	6	1.18
	(39.9)									(50.0)			(36.0)		
Origin of the product	7	6	1.03	7 (45.6)	6	1.16	6 (41.0)	6	1.05	7	4	0.98	6	6	1.46
	(44.7)									(38.1)			(28.9)		

## Table 4. SFSCs consumers' F&V choice criteria

Examined Cronbach α: Italy= 0.87, France= 0.82, Greece=0.77, Egypt= 0.76, Morocco=0.80.

Regarding consumers' F&V risks perceptions, three option of paying attention to the additives (like colorants, flavourings, and preservatives), caring hazardous chemicals released from F&V packaging, and purchasing non-genetically modified F&V products were very important for Italians SFSCs consumers. Although French consumers cared almost all five risk options as very important, pesticide/other chemical residues used during crop growth or processing was the most important to them, along with additives, compared to the other options. In addition, Greek SFSCs consumers preferred to buy non-genetically modified F&V products, as well as cared about residues of pesticides or other chemicals used in growing and processing of F&V. Furthermore, Egyptian consumers paid more attention to food poisoning (e.g. due to the presence of harmful germs). Food poisoning was also important for Moroccan consumers, but after additives and hazardous chemicals released from packaging (Table 5).

### Table 5. SFSCs consumers' F&V risks perceptions

Italy	France	Greece	Egypt	Morocco







	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Food poisoning	6 (32.5)	6	1.2 4	7 (29.6 )	6	1.4 3	6 (36.6)	6	1.3 3	7 (48.2)	6	1.1 0	7 (37.7 )	6	1.2 2
Residues of pesticides/other chemicals	6 (34.4)	6	1.3 0	7 (35.6 )	6	1.2 1	7 (39.0)	6	1.2 2	7 (45.6)	6	1.2 3	7 (36.4 )	6	1.3 7
Hazardous chemicals released from packaging	7 (35.4)	6	1.4 0	7 (33.7 )	6	1.2 8	6 (31.7)	6	1.2 8	7 (42.9)	6	1.2 3	7 (38.1 )	6	1.3 9
Additives	7 (40.8)	6	1.1 9	7 (40.4 )	6	1.2 5	6 (36.0)	6	1.1 5	7 (42.0)	6	1.2 6	7 (40.2 )	6	1.2 5
Non-Genetically Modified products	7 (34.7)	6	1.3 2	7 (32.6 )	6	1.2 6	7 (42.2)	6	1.2 9	6 (35.8)	6	1.2 0	7 (33.1 )	6	1.3 5

Examined Cronbach α: Italy= 0.85, France= 0.86, Greece=0.83, Egypt= 0.82, Morocco=0.84.

After examining consumer preferences in F&V, related voluntary sustainable standards were addressed. How often do consumers seek certifications or standards and what is the level of satisfaction and trust in the available certifications for these standards in F&V. Most of SFSCs consumers in all five countries occasionally or some time seek for the related certification or standards. However, the level of satisfaction and trust in the available certificates varied across the target countries. Most of the SFSCs consumer (about 40 % of them) were satisfied sometimes with the available certification (Figure 39). Although about 9% of Italian consumers and about 10% of Greek consumers were somewhat dissatisfied. This pattern was almost similar to their trust to the existing certificates (Figure 40).



Figure 38. Frequency that SFSCs consumer seek for certifications/standards (%)



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Figure 39. The SFSCs consumers level of satisfaction in the available certificates (%)



Figure 40. The SFSCs consumers level of trust in the available certificates (%)

Regarding information consumers pay attention to when purchasing F&V, organic certification and shelf-life information were the two most important pieces of information Italian consumers usually check. French consumers, on the other hand, pay more attention to geographic origin and environmentally friendly production. As for the French, geographical origin was the most important information for Greek consumers, but they placed more emphasis on shelf life than on environmentally friendly production. Egyptian and Moroccan consumers generally pay attention to the nutritional content of food products in addition to shelf life (Table 6).

### Table 6. Information that SFSCs consumers check when shopping for F&V

Italy	France	Greece	Egypt	Morocco







	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev									
Nutritional content	5 (23.5)	6	1.50	5 (25.6)	6	1.57	5 (25.0)	6	1.42	7 (37.6)	6	1.22	6 (33.9)	6	1.34
Geographical origin	6 (32.8)	5	1.10	7 (35.6)	6	1.21	6 (36.6)	6	1.22	6 (32.7)	6	1.40	6 (28.9)	6	1.49
Shelf life	6 (35.0)	6	1.27	5 (27.0)	6	1.33	6 (33.1)	6	1.34	7 (60.6)	6	0.87	7 (43.5)	6	1.37
Organic certification	6 (36.3)	6	1.27	6 (27.4)	6	1.37	6 (27.6)	6	1.47	6 (35.8)	6	1.25	6 (28.5)	6	1.50
Environmentally friendly production	6 (33.8)	6	1.17	6 (28.9)	6	1.33	6 (27.0)	6	1.52	6 (35.0)	6	1.21	6 (27.6)	6	1.59
Ethical/social aspects information	6 (28.0)	6	1.40	5 (24.8)	6	1.42	4 (24.1)	6	1.55	6 (33.6)	6	1.32	6 (29.3)	6	1.68

Examined Cronbach α: Italy= 0.88, France= 0.85, Greece=0.88, Egypt= 0.86, Morocco=0.86.

In the following, two dimensions of sustainability certification, socioeconomic and environmental certifications, are examined below. Previously, participants' awareness or familiarity with the concept of sustainability was examined. According to Figure 41, although the frequency distribution of familiarity with the concept of sustainability was in the middle range (somewhat familiar), about 6% of Italian, 18% of French, 20% of Greek, 10% of Egyptian, and 21% of Moroccan participants were not at all familiar with the concept of sustainability. In addition, it is worth highlighting that 25% of Egyptian consumers were extremely familiar with the concept compared to the other countries (8% of Italian and French, 4% of Greek and 13% of Moroccan participants).



Figure 41. SFSCs consumers' familiarity with the concept of sustainability.

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Before examining the information that the participants are looking for in socio-economic certifications, it was asked their feel about that certification Figure 42. Most responses were neither positive nor negative, but there were about 23% of Italian, 20% of French, 23% of Greek, 26% of Egyptian, and 17% of Moroccan participants who were positive about this certificate.



Figure 42. SFSCs consumers feel about Socio-economic certification

The results of information that was important for consumers in socio-economic certification is shown in Table 7. If we want to describe the three most important of the six options, do not employ child labour, working conditions and wages, and do not involve any legal violations in F&V production process for Italian, child labour, supporting local farmers, and animal welfare for France, child labour, animal welfare, and working conditions and wages for Greek, legal violations, supporting local farmers and working conditions and wages for Egyptian and Moroccan participants were the most important information for the SFCSs participants.

	It	taly		Fr	ance		Gr	eece		E	gypt		M	orocco	
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev									
Child labour	7 (44.4)	6	1.29	7 (49.3)	5	1.28	7 (53.2)	5	1.09	7 (42.0)	6	1.28	7 (31.8)	5	1.4
Working conditions and wages	7 (43.1)	6	1.17	7 (42.6)	6	1.14	7 (44.2)	5	1.03	7 (51.8)	5	0.93	7 (39.3)	6	2 1.2 5
Animal welfare	7 (39.9)	4	1.10	7 (46.7)	6	1.28	7 (45.9)	6	1.10	7 (49.1)	6	0.89	6 (33.5)	6	1.3 3
Fair trade	6 (34.1)	6	1.20	7 (39.3)	6	1.16	6 (38.1)	6	1.05	7 (48.2)	4	0.91	7 (38.9)	6	1.2 0
Supporting local farmers	7 (41.5)	5	1.11	7 (47.0)	6	1.15	7 (42.7)	6	1.02	7 (52.2)	3	0.80	7 (48.1)	6	1.0 8

57

Table 7. Information that is important for SFSCs consumers in Socio-economic certification





MED-LI	NKS PRIMA p	roject	De	eliverable	1.3 -	Consum	ner report	on at	ttribute	appreciat	ion a	nd willi	ngness to p	bay	
Legal violations	7 (43.1)	5	1.08	7 (43.3)	6	1.17	7 (37.8)	6	1.17	7 (53.5)	5	0.92	7 (42.7)	6	1.2 5

Examined Cronbach  $\alpha$ : Italy= 0.92, France= 0.90, Greece=0.88, Egypt= 0.83, Morocco=0.87.

After the evaluation of the socioeconomic certificate, consumers' feelings were generally more positive about the environmental certifications than the socioeconomic certificate (Figure 43).



Figure 43. SFSCs consumers feel about environmental certification

In addition, regarding information that was important for consumers in environmental certification, information about reducing use of pesticides/fertilizers, using water sparingly, and low carbon emissions for Italian, reducing use of pesticides/fertilizers, without leading to deforestation nor loss of diversity, and natural resources protecting for French and Greek, using water sparingly, reducing use of energy, and reducing use of pesticides/fertilizers for Egyptian, and using water sparingly, reducing use of pesticides/fertilizers, and natural resources protecting for Moroccan participants were most important three information in perspective of participants (Table 8).

Table 6. Informatio	on that	. 15 11	nport	ant io	1 3 5 3		nsume	15 11	envi	onme	ntai	certii	ication		
		Italy		F	rance	•	G	reece	5	E	Egypt		M	orocc	0
	Mode (%)	Range	Std Dev	(%) apoM	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Deforestation nor loss of diversity	6 (33.8)	6	1.12	7 (40.7)	5	1.13	7 (41.9)	6	1.04	7 (38.1)	6	1.19	7 (33.9)	6	1.41
Natural resources protecting	6 (33.1)	6	1.09	7 (39.6)	5	1.07	6 (39.5)	5	0.98	7 (35.8)	6	1.34	7 (34.3)	6	1.46

1.31

1.18

58

6

6

(34.3)

(38.1)

6

6

1.24

1.21

7

7

(36.3)

(48.2)

# Table 8. Information that is important for SFSCs consumers in environmental certification

6

6



6

6

(30.9)

(33.1)

6

6

Packaging that is not

Reducing use of energy

recyclable

1.26 7

1.11

(33.7)

(34.1)

7



6

5

1.31

0.95

7

7

(31.0)

(32.2)

6

6

1.55

1.47

MED-LINKS PRIMA project	Deliverable 1.3 -	Consumer report on	attribute appreciation	and willingness to pay

Low carbon emissions	6 (35.7)	6	1.16	7 (38.5)	5	1.17	6 (35.5)	6	1.28	6 (35.8)	6	1.42	6 (30.5)	6	1.53
Reducing use of pesticides/fertilizers	7 (36.3)	6	1.09	7 (45.2)	6	1.21	7 (54.1)	5	0.98	7 (47.3)	6	1.15	7 (43.5)	6	1.33
Using water sparingly	6 (37.6)	6	1.10	7 (34.4)	4	1.10	7 (36.0)	6	1.27	7 (50.4)	3	0.83	7 (43.9)	6	1.17

Examined Cronbach α: Italy= 0.92, France= 0.92, Greece=0.91, Egypt= 0.77, Morocco=0.8

Regarding consumers' willingness to pay a higher price for their favorite F&V if it has socioeconomic certification, 64% of Italian, 59% of French, 53% of Greek, 85% of Egyptian, and 67% of Moroccan participants said yes and were willing to pay for socioeconomic certification (Figure 44). The willingness to pay a price premium of up to 5% for the socio-economic certificate had the most frequency in the target countries. With a price premium of up to 5%, SFSCs participants in almost all countries were more willing to pay for vegetables with socioeconomic certificate than for fruit. But at higher values (up to 10%), willingness to pay was higher for fruit than for vegetables. This behavior was also observed at values up to 30% and more than 30%.



Figure 44. SFSCs consumers' WTP a higher price for your favourite fruit or vegetable if it had a socio-economic certification (%).



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In addition, the results of willingness to pay a higher price for favorite F&V if it had an environmental certification revealed that more consumers were willing to pay higher price premiums for F&V with an environmental certification compared to socioeconomic certification. 70% of Italian, 60% of French, 54% of Greek, 85% of Egyptian, and 72% of Moroccan participants said yes and were willing to pay for socioeconomic certification (Figure 45). As with the socioeconomic certificate, the willingness to pay a price premium of up to 5% for the environmental certificate had the most frequency in the target countries. Comparing the different price levels, participants were willing to pay a higher price premium for fruit compared to vegetables at almost all levels from 5% to over 30%.



Figure 45. SFSCs consumers' WTP a higher price for your favourite fruit or vegetable if it had an environmental certification (%).

# 4.2. Green public procurement (FR, IT)

Demographic characteristics of participants in GPP are described in Table 9. According to the aims of the research, the target countries included two countries of Italy (228 participants), and France (306 participants). The gender distribution was such that 52% of the Italian participants were female and 48% were male, and 57% of the French participants were female and 43% were



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male. Most respondents fell in the 25-54 age group (64% in Italy and 51% in France). The distribution of the level of education and the number of children in the family was different in the studied countries.

	Definitions	Italy	France
Condor	Male	48.2	42.8
Gender	Female	51.8	57.2
	18-24	11.8	30.1
Age	25-54	64.0	51.0
(Years old)	55-64	17.5	15.0
	Over 65	6.6	3.9
	Elementary school	1.3	1.0
Education	High school	75.9	42.8
	University and/or above	22.8	56.2
Children in	0-5 years old	18.2	17.4
family	6-10	24.4	17.6
(numbers/	11-13	18.8	16.7
years old)	over 13	38.6	48.3

# Table 9. Socio-demographic characteristics of the GPP sample (%)

Number of participants: Italy=228, France=306.

The frequency of purchasing F&V by GPP consumers showed that about 46% of Italian consumers and about 64 % of French consumers purchased at least once e week F&V. This percentage for purchasing F&V several times in the week was 20% and 17% for Italy and France respectively (Figure 46).



Figure 46. The frequency of purchasing F&V by GPP consumers (%).

Regarding consumers' perceptions of F&V benefits, the importance of five options was assessed. According to Table 10, all five options were considered the most favourite choice in two countries of Italy and France. However, the percentages of choosing the desired option were different. Vitamins and minerals were considered the most important benefits of eating F&V by





respondents in both countries. After that, improvement of the digestive system and a better appearance were perceived important benefits of F&V consumption.

		Italy		France   (%) appose and appose   7 (42.2) 6   7 (31.7) 6   7 (39.5) 6   7 (30.1) 6   7 (32.7) 6		
Options	Mode (%)	Range	France   Deg <thdeg< th=""> Deg Deg</thdeg<>	Std Dev		
Vitamins and minerals	7 (53.1)	6	1.15	7 (42.2)	6	1.25
Cut down calorie	7 (33.8)	6	1.28	7 (31.7)	6	1.21
Body's digestive system	7 (41.2)	6	1.12	7 (39.5)	6	1.23
Reduces getting cancer	7 (33.3)	6	1.25	7 (30.1)	6	1.45
Better in appearance	7 (39.9)	6	1.18	7 (32.7)	6	1.28

<b>Fable 10. GPP consumers</b>	conception	toward F&V	benefits
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Examined Cronbach  $\alpha$ : Italy= 0.88, France= 0.85.

In case of consumers' F&V choice criteria, freshness, seasonality, taste and flavour, and origin of the product were more important than other options in Italy and France Table 11.

		Italy			France	
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Freshness	7 (42.5)	6	1.35	7 (37.6)	6	1.27
Seasonality	7 (42.5)	6	1.13	7 (35.6)	6	1.29
Nutritional contents	6 (35.5)	6	1.13	7 (28.8)	6	1.36
Taste and flavour	7 (42.5)	6	1.16	7 (46.4)	6	1.14
Color and appearance	6 (36.0)	6	1.17	7 (31.4)	6	1.40
Access to buy	6 (38.2)	6	1.11	7 (31.4)	6	1.32
Origin of the product	7 (38.2)	6	1.23	7 (31.7)	6	1.37

## Table 11. GPP consumers' F&V choice criteria

Examined Cronbach  $\alpha$ : Italy= 0.88, France= 0.84.

In addition, regarding consumers' F&V risk perceptions, GPP consumers cared more residues of pesticides/other chemicals, additives in Italy and France. Furthermore, Italian consumers considered genetically modified foods and French consumers considered hazardous chemicals released from packaging as another risk of F&V consumption they perceived (Table 12).

# Table 12. GPP consumers' F&V risks perceptions

	lt	taly		Fr	ance		
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	
Food poisoning	6 (28.1)	6	1.51	7 (26.1)	6	1.54	
Residues of pesticides/other chemicals	7 (32.0)	6	1.57	7 (29.1)	6	1.44	
Hazardous chemicals released from packaging	7 (29.4)	6	1.55	7 (28.8)	6	1.46	
Additives	7 (32.0)	6	1.37	7 (29.7)	6	1.44	





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Non-Genetically Modified products7 (30.7)61.346 (26.8)61.35Examined Cronbach \alpha: Italy= 0.89, France= 0.90.
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In case of frequency that GPP consumer seek for certifications/standards, the highest frequency was reported as "occasionally or sometimes". However, about 25% of Italians and 28% of French reported that they almost every time search for the relevant certification (Figure 47).



Figure 47. Frequency that GPP consumer seek for certifications/standards (%)

45% of Italian and 33% of French GPP consumers were somewhat satisfied that based on their trust in the available certificates (Figure 48 and Figure 49).



Figure 48. The GPP consumers level of satisfaction in the available certificates (%)







Figure 49. The GPP consumers level of trust in the available certificates (%)

Among the information that consumers check when shopping for F&V, shelf life, organic certification, and environmentally friendly production were information that GPP consumers check when shopping for F&V. In addition to this information, French consumers also cared about geographical origin (Table 13).

	Italy			France		
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Nutritional content	5 (25.4)	6	1.54	5 (22.2)	6	1.67
Geographical origin	6 (30.7)	6	1.23	7 (26.5)	6	1.45
Shelf life	6 (34.2)	6	1.33	5 (27.5)	6	1.40
Organic certification	6 (33.3)	6	1.43	6 (24.8)	6	1.56
Environmentally friendly production	6 (33.3)	6	1.39	6 (26.1)	6	1.52
Ethical/social aspects information	6 (28.9)	6	1.47	5 (25.8)	6	1.52

Table 13. Information that GPP	consumers check when	shopping for fruit	& vegetables
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Examined Cronbach  $\alpha$ : Italy= 0.91, France= 0.89.

In order to evaluate consumers' perception of sustainability certificates, at first, their familiarity with the concept of sustainability was asked. 36% of Italian consumers were moderately familiar with the concept of sustainability, as were 22% of French consumers. However, 8% of Italian and 19% of French participants were not at all familiar with this concept (Figure 50).







Figure 50. GPP consumers' familiarity with the concept of sustainability.

As with SFSCs, almost the majority of GPP consumers had a somewhat positive or positive feeling toward socioeconomic certification. Comparing the two countries, Italian participants were more positive than French consumers (Figure 51).



Figure 51. GPP consumers feel about Socio-economic certification (%)

Regarding the Italian perspective, three information that is more important to consumers in socioeconomic certification includes do not employ child labour, support for local farmers, and also do not involve any legal violations in the production of F&V. In comparison, in addition to child labor and supporting local farmers, French consumers also considered animal welfare as important in a socioeconomic certification (Table 14).





	ľ	taly		France			
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	
Child labour	7 (39.5)	6	1.31	7 (38.9)	6	1.41	
Working conditions and wages	7 (36.4)	6	1.26	7 (35.6)	6	1.29	
Animal welfare	6 (34.6)	5	1.09	7 (40.2)	6	1.46	
Fair trade	7 (32.0)	6	1.30	7 (32.0)	6	1.32	
Supporting local farmers	7 (39.0)	5	1.15	7 (36.9)	6	1.33	
Legal violations	7 (38.6)	6	1.20	7 (35.3)	6	1.30	

Table 14. Information that is important for GPP consumers in Socio-economic certification

Examined Cronbach  $\alpha$ : Italy= 0.93, France= 0.91.

Furthermore, GPP consumers had a more positive and very feeling for environmental certificates compared to social certificates (Figure 52).



Figure 52. GPP consumers feel about environmental certification

In terms of information relevant to environmental certification, Italian GPP consumers emphasized information on water conservation, non-recyclable packaging, and pesticides/fertilizers used in F&V production. On the other hand, for French GPP consumers, in addition to information about pesticides/fertilizers used in F&V production, information such as deforestation nor loss of diversity and natural resources protecting were among the three important options (Table 15).

# Table 15. Information that is important for GPP consumers in environmental certification

 Italy	Italy		France
Mode (%)	Std Dev	Mode (%)	Range Std Dev





Deforestation nor loss of diversity	6 (34.2)	6	1.22	7 (35.6)	6	1.30	
Natural resources protecting	6 (36.4)	6	1.09	7 (32.4)	6	1.28	
Packaging that is not recyclable	6 (40.8)	6	1.23	7 (29.4)	6	1.38	
Reducing use of energy	6 (36.8)	5	1.13	6 (30.7)	6	1.24	
Low carbon emissions	6 (38.2)	6	1.24	7 (32.0)	6	1.32	
Reducing use of pesticides/fertilizers	6 (39.0)	6	1.11	7 (37.3)	6	1.31	
Using water sparingly	6 (42.5)	6	1.09	7 (29.7)	6	1.27	

Examined Cronbach  $\alpha$ : Italy= 0.93, France= 0.92.

Next, the results of willing to pay a higher price primum for consumers' favorite F&V if it had a socio-economic and environmental certification are shown in Figure 53 and Figure 54. As with SFSCs, GPP consumers in both Italy and France had a higher frequency of yes responses to the environmental certification compared to the socioeconomic certification. However, the percentage results of price premiums show that consumers in both countries were almost willing to pay more for vegetables with socioeconomic certification than for fruit. Although the frequency of willingness to pay in the form of price premiums was higher for environmental certification than for socioeconomic certification, GPP consumers were willing to pay more for fruit with environmental certification than for vegetables, in contrast to socioeconomic certification.









Figure 53. GPP consumers' WTP a higher price for your favourite fruit or vegetable if it had a socio-economic certification (%).









Figure 54. GPP consumers' WTP a higher price for your favourite fruit or vegetable if it had an environmental certification (%).

# 4.3. Export-oriented supply chains (FR, GR, IT)

Demographic characteristics of participants in GPP are described in Table 16. According to the aims of the research, the target countries included three countries of Italy (217 participants), France (314 participants), and Greece (217 participants). The gender distribution was such that 49% of the Italian participants were female and 51% were male, 59% of the French participants were female and 41% were male. Moreover, the participation of female and male in Greece was 51% and 49%, respectively. Most respondents fell in the 25-54 age group (53% in Italy, 39% in France, and 66% in Greece). The distribution of the level of education and the number of children in the family was different in the studied countries.







• •		-		
	Definitions	Italy	France	Greece
Condor	Male	50.7	41.1	48.8
Gender	Female	49.3	58.9	51.2
	18-24	7.83	21.34	15.67
Age	25-54	53.00	38.85	65.90
(Years old)	55-64	27.65	18.15	15.67
	Over 65	11.52	21.66	2.76
	Elementary school	4.61	2.23	1.38
Education	High school	76.04	55.73	43.78
	University and/or above	19.35	42.04	54.84
Children in family	0-5 years old	14.88	16.90	19.81
(numbers/ years old)	6-10	15.48	13.45	15.46
	11-13	17.26	10.34	15.94
	over 13	52.38	59.31	48.79

Table 16. Socio-demograph	c characteristics of the	EOSC sample (%)
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Number of participants: Italy=217, France=314, Greece= 217.

According to the results of purchasing F&V frequency by EOSC consumers (several times a week option), Greek consumers purchase more F&V than Italian consumers, and Italians purchase more F&V than the French during the week (Figure 55).





Regarding the benefits of eating F&V, Italian and Greek EOSC consumers perceived vitamins and minerals, improvement of appearance, and improvement of the digestive system as the top three benefits of eating F&V among five options. Furthermore, French consumers mentioned cut down calorie as another important benefits of F&V consumption (Table 17).

### Table 17. EOSC consumers' conception toward F&V benefits

	Italy		France	Greece
Thining the second seco	e PRIMA programme is an Art. 185 tiative supported and founded der Horizon 2020, the European ion's Framework Programme for search and Innovation	70	ME	ED-LINKS 🏹

Options	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Vitamins and minerals	7 (50.2)	5	0.98	7 (39.2)	6	1.22	7 (50.2)	5	0.84
Cut down calorie	7 (32.7)	5	1.13	6 (26.4)	6	1.24	6 (37.3)	6	1.27
Body's digestive system	7 (37.8)	6	1.16	7 (36.3)	6	1.16	7 (42.9)	5	0.87
Reduces getting cancer	7 (32.3)	5	1.19	4 (28.7)	6	1.44	6 (30.9)	5	1.15
Better in appearance	7 (38.7)	6	1.28	6 (26.1)	6	1.33	6 (37.8)	4	1.02

Examined Cronbach  $\alpha$ : Italy= 0.85, France= 0.86, Greece=0.80.

Freshness, taste, seasonality, access to buy, color, and nutritional content were the most important criteria for F&V selection from the perspective of EOSC consumers in three countries (Italy, France, and Greece) (Table 18).

### Table 18. EOSC consumers' F&V choice criteria

	Italy			France			Greece		
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Freshness	7 (44.7)	5	1.08	7 (41.1)	6	1.24	7 (42.4)	4	0.93
Seasonality	7 (37.3)	4	1.08	7 (31.8)	6	1.32	7 (38.2)	6	1.02
Nutritional contents	6 (37.3)	6	1.16	6 (26.4)	6	1.36	7 (39.6)	4	0.88
Taste and flavor	7 (40.1)	5	0.98	7 (46.5)	6	1.12	7 (47.5)	6	1.09
Color and appearance	6 (35.5)	5	1.01	7 (29.0)	6	1.33	6 (39.2)	6	1.23
Access to buy	6 (41.9)	5	1.08	7 (35.4)	6	1.15	6 (41.5)	6	1.04
Origin of the product	6 (33.2)	6	1.29	4 (23.9)	6	1.50	6 (25.8)	6	1.38

Examined Cronbach  $\alpha$ : Italy= 0.82, France= 0.82, Greece=0.81.

In terms of risk perception, Genetically Modified products and additives were perceived as the two most important risks of F&V consumption. In addition of Genetically Modified products, pesticide/other chemical residues were also important by French consumers as two other possible risks of F&V consumption. Greek consumers also perceived food poisoning along with hazardous chemicals released from packaging (Table 19).

# Table 19. EOSC consumers' F&V risks perceptions

	Italy			France			Greece		
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Food poisoning	6 (24.0)	6	1.46	5 (22.9)	6	1.61	6 (35.9)	6	1.22
Residues of pesticides/other chemicals	6 (28.6)	6	1.39	5 (27.4)	6	1.49	6 (35.0)	5	1.11






Hazardous chemicals released from packaging	6 (28.1)	6	1.57	7 (22.3)	6	1.58	6 (37.3)	5	1.14
Additives	6 (29.5)	6	1.43	5 (25.8)	6	1.53	6 (32.3)	6	1.25
Non-Genetically Modified products	6 (30.9)	6	1.34	5 (29.3)	6	1.38	6 (30.9)	6	1.33
Examined Cronbach q: Italy= 0.90 Fra	nce=0.89 (	Greece	28 0=2						

0.90, France= 0.89, Greece=0.83. onbach α: italy

After examining consumers' F&V preferences, questions were asked about F&V-related voluntary sustainable standards. According to the results of the frequency that EOSC consumer seek for certifications (Figure 56), 43% of Italian and French as well as 46% of Greek EOSC consumers sometimes seek for the relevant F&V certifications/standards.



Figure 56. Frequency that EOSC consumer seek for certifications/standards (%)







Among these consumers, 39% of Italian, 37% of French, and 33% of Greek consumers were somewhat satisfied and had trust with the available certifications (Figure 57 and Figure 58).



Figure 57. The EOSC consumers level of satisfaction in the available certificates (%)



Figure 58. The EOSC consumers level of trust in the available certificates (%)

These consumers generally paid attention to information such as shelf life, geographic origin, and organic certification when shopping for F&V in Italy and Greece. In addition to this information, French consumers paid attention to nutrient content (Table 20).

	_	-	
Italv	France	Greece	







	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Nutritional content	4 (23.0)	6	1.65	5 (24.5)	6	1.75	5 (25.3)	6	1.42
Geographical origin	6 (27.2)	6	1.44	5 (35.0)	6	1.59	5 (28.6)	6	1.36
Shelf life	6 (28.6)	6	1.37	5 (28.7)	6	1.60	6 (32.7)	6	1.29
Organic certification	6 (27.2)	6	1.57	4 (25.8)	6	1.76	6 (26.7)	6	1.45
Environmentally friendly production	5 (24.0)	6	1.61	4 (26.8)	6	1.69	5 (25.8)	6	1.51
Ethical/social aspects information	4 (25.8)	6	1.64	4 (26.8)	6	1.68	4 (19.8)	6	1.62
Evamined Cranbach at Italy = 0.90 Era	nco = 0.00	Trance	-0 07						

Examined Cronbach α: Italy= 0.89, France= 0.90, Greece=0.87.

Regarding sustainability certifications or standards, familiarity with the concept of sustainability was assessed first. As shown in Figure 59, 38% of GPP consumers in France, 26% in Greece, and 10% in Italy were not at all familiar with the concept. However, 28% of Italian, 17% of French, and 21% of Greek consumers were moderately and very familiar with this topic.



Figure 59. EOSC consumers' familiarity with the concept of sustainability.

EOSC consumers were then asked for consumers opinion on socioeconomic certification. The most frequent responses were in the range of neither positive nor negative (30% of Italian, 50% of French, and 41% of Greek consumers). However, somewhat positive and positive were the next most frequent options (Figure 60).









Figure 60. EOSC consumers feel about Socio-economic certification (%)

Regarding information that is important for consumers in Socio-economic certification, almost all information was important to consumers in the three countries, however a few items were more important than the rest of the options (Table 21). In terms of the three most frequent options, information about do not employ child labour, animal welfare, and working conditions and wages were particularly highlighted by Italian and Greek consumers. In addition to this information, it was important for French EOSC consumers to know that no legal violations are committed in the production of F&V.

Table 21. Information that is im	portant for EOSC consumers in	Socio-economic certification
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	Italy		Fra	France			Greece		
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Child labour	7 (42.4)	6	1.25	7 (38.9)	6	1.49	7 (54.8)	5	1.10
Working conditions and wages	7 (35.5)	6	1.31	7 (31.2)	6	1.36	7 (50.2)	5	1.04
Animal welfare	7 (39.6)	6	1.25	7 (37.6)	6	1.40	7 (47.9)	6	1.06
Fair trade	6 (29.5)	6	1.35	5 (27.4)	6	1.42	7 (43.8)	5	1.08
Supporting local farmers	6 (30.4)	6	1.16	7 (31.5)	6	1.46	7 (41.5)	6	1.06
Legal violations	7 (34.6)	6	1.28	7 (32.2)	6	1.40	7 (41.0)	5	1.14

Examined Cronbach  $\alpha$ : Italy= 0.94, France= 0.94, Greece=0.90.

As observed in other supply chains, EOSC consumers had more positive feelings toward environmental certification compared to socioeconomic certification (Figure 61).









Figure 61. EOSC consumers feel about environmental certification (%)

Regarding the information that is important to EOSC consumers in environmental certifications, the three most frequent information of about reducing use of pesticides/fertilizers, natural resources protecting, and low carbon emissions were considered the most important pieces of information in environmental certifications by Italian EOSC consumers. In addition, information about deforestation and loss of diversity, reduction of pesticide/fertilizer use, and protection of natural resources were the three most important pieces of information from the perspective of French and Greek consumers (Table 22).

	Italy		France		Greece				
	(n=217 pa	articip	ants)	(n=314 pa	articip	bants)	(n=217 participants)		oants)
	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev	Mode (%)	Range	Std Dev
Deforestation nor loss of diversity	6 (32.3)	6	1.18	7 (37.9)	6	1.47	7 (41.9)	6	1.09
Natural resources protecting	6 (36.9)	6	1.08	7 (31.8)	6	1.40	7 (37.8)	6	1.07
Packaging that is not recyclable	6 (31.8)	6	1.32	7 (30.9)	6	1.45	7 (34.6)	6	1.29
Reducing use of energy	6 (33.6)	6	1.13	7 (28.3)	6	1.40	6 (30.9)	6	1.15
Low carbon emissions	6 (34.6)	5	1.12	7 (26.4)	6	1.41	7 (38.2)	6	1.26
Reducing use of pesticides/fertilizers	7 (31.8)	6	1.25	7 (35.4)	6	1.39	7 (49.3)	6	1.05
Using water sparingly	6 (33.2)	6	1.18	7 (29.9)	6	1.38	7 (37.3)	6	1.23

#### Table 22. Information that is important for EOSC consumers in environmental certification

Examined Cronbach  $\alpha$ : Italy= 0.93, France= 0.95, Greece=0.93.

In the end, willing to pay a higher price premium for EOSC consumers favorite F&V if it had a socio-economic certification was addressed. Unlike consumers in other supply chains, Italian EOSC consumers were not very willing to pay for such certification (51% said yes and 49% said no). Among French consumers, there were even more "no" answers than "yes" answers when it came to paying more for this certificate (40% yes and 60% no). Only Greek consumers were





willing to pay more for this certification (65% yes and 35% no). The results showing the WTP at different price primum levels for fruits and vegetables were different for socioeconomics certification, although it was found that the WTPs for vegetables in some countries were more than for fruit in this type of certification (Figure 62).



Figure 62. EOSC consumers' WTP a higher price for your favorite fruit or vegetable if it had a socio-economic certification (%).

Similar to the results related to the socioeconomic certification were also observed in the environmental certificate, so that Italian and Greek EOSC consumers more answered yes for this type of certification. However, similar to socioeconomic certification, more consumers responded no to pay more for a F&V with an environmental certification (41% yes and 59% no). Results showing WTP at different price premiums for fruits and vegetables were different for environmental certification, although it was found that WTPs for vegetables for up to 20% and up to 25% were higher than for fruits in some countries (Figure 63).







Figure 63. EOSC consumers' WTP a higher price for your favourite fruit or vegetable if it had an environmental certification (%).

#### 4.4. Clustering analysis

Segmentation of respondents was done via a combination of Principal Component Analysis (PCA) and cluster analysis. The PCA analysis items with a factor loading below 0.40 commonality (Eun et al., 2020) and an eigenvalue lower than or equal to 1 were excluded. The internal reliability of each factor was assessed by Cronbach's alpha (Cronbach, 1951).

After obtaining the valid factors, market segments based on consumers' adjusted food related lifestyles were obtained using cluster analysis (A hierarchical cluster analysis with a Ward linkage). In order to check the difference in the Likert scale responses across the clusters, Kruskal-Wallis test was used. The p-value indicates whether there is a significant difference in the Likert scale responses across the clusters.





#### 4.4.1. Short food supply chain (EG, FR, GR, IT, MO)

The results of SFSCs consumer clustering are presented separately for each country. Before that, the results of the Kaiser-Meyer-Olkin Measure (KMO) (Kaiser, 1974) and Bartlett's (Bartlett, 1954) tests are presented as described in Table 23. These two tests assess the suitability of data for factor analysis and determine whether the variables in the dataset are appropriate for extracting underlying latent factors. A high KMO value (above 0.6 or 0.7) and a significant Bartlett's test are indicative of a dataset with variables that are well-suited for factor analysis. According to the results of KMO and Bartlett's tests, the data are suitable and appropriate for factor analysis.

#### Table 23. KMO and Bartlett's Test in SFSCs factor analysis

	Italy	France	Greece	Egypt	Morocco
KMO measure of Sampling Adequacy	0.917	0.909	0.890	0.829	0.904
Bartlett's Test (Approx. Chi-Square)	5357.399	4790.683	5123.109	2985.802	3762.615
Sig.	0.000	0.000	0.000	0.000	0.000

#### a) Italy

The results of the factor analysis for Italian SFSCs consumers are presented in Table 24. Based on the factor loading, eigenvalue, and Cronbach's alpha, the 29 items can be grouped into six significantly different factors of F&V consumption habits, purchasing motives, quality and taste perception, health concern-confidence in fruit safety, important of F&V information, and Price-consciousness scales.

#### Table 24. Exploratory and confirmatory factor analysis for Italian SFSCs consumers

Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		10.93	0.91
regularly purchasing F&V is necessary.	0.86		
regularly purchasing F&V is advantageous.	0.78		
regularly purchasing F&V is acceptable.	0.80		
regularly purchasing F&V is important.	0.88		
Factor 2: Purchasing motives		2.72	0.85
Giving more vitamins and minerals.	0.52		
Helping to cut down calories.	0.76		
Helping to improve body's digestive system.	0.78		
Reducing the risk of getting cancer.	0.78		
Helping to look better in appearance.	0.67		
Factor 3: Quality and taste perception		1.64	0.87
One of the criteria for choosing F&V is freshness.	0.42		
Seasonality of F&V is important to me.	0.42		
Nutritional contents of F&V are important to me.	0.46		
The taste and flavor of F&V influences my choice.	0.51		
The color and appearance of F&V influence my shopping choice.	0.41		
Factor 4: Health concern-confidence in fruit safety		1.48	0.85
Paying attention to the food poisoning when buying F&V.	0.65		
Caring about residues of pesticides/other chemicals.	0.73		





Caring about chemicals released from F&V packaging.	0.77		
Paying attention to the additives.	0.74		
likely to purchase non-Genetic Modified F&V.	0.63		
Factor 5: important of F&V information		1.17	0.88
Ingredients list (nutrition or vitamin facts).	0.77		
Geographical origin.	0.49		
Shelf life.	0.73		
Presence of the organic logo.	0.77		
Presence of environmental friendly production logos.	0.78		
Presence of ethical/social aspects logo.	0.77		
Factor 6: Price-consciousness scales		1.14	0.60
When I buy F&V, I really look for specials.	0.50		
I'm willing to pay even more for the special F&V.	0.55		
I check the prices, even when I am buying inexpensive F&V.	0.65		
I often wait to purchase F&V, so I can get them on low price	0.81		

Cluster analysis resulted in three clusters based on the factors obtained from PCA in Table 25. Results are given as the value of the mode and its frequency in parentheses. Cluster 1, labelled as "value seeking" consumers, accounted for about 33.4% of the sample (N=104) and had high scores on almost all items compared to the other segments. A type of consumers who looks to get the best possible value for their money when making purchasing decisions. They seek a balance between price and the features, benefits, and quality of the product or service. They perceived the benefits of consuming F&V as a motive for purchase, the quality and taste of F&V were important to them, and they paid attention to food safety and information about F&V such as geographic origin and shelf life when making purchases. In addition, for these consumers, who can also be described as sustainability advocates, information related to sustainability was important, such as the presence of logos for environmentally friendly production and ethical/social aspects.

Cluster 2, the group of "quality-conscious" consumer, comprises about 39.2% of the sample (N=122). The number of disturbed consumers in this cluster was more than in the other clusters. For them, it was important to buy F&V regularly, and they mentioned the giving of vitamins and minerals as the most important benefits of F&V. They gave high scores for freshness, seasonality, quality, and taste perception compared to other factors.

Cluster 3, referred to "conventional" or "traditional" consumers (about 27.3% of the sample, N=85), because they gave the lowest scores for the items compared to the other two clusters.

Tuble 25. cluster analysis for random of 505 consumers								
Factors and items	Cluster 1	Cluster 2	Cluster 3	Kruskal-	Sig			
	33.4%	39.2%	27.3%	Wallis H				
	(n=104)	(n=122)	(n=85)					
Factor 1: F&V consumption habits								
regularly purchasing F&V is necessary.	7 (77.9)*	6 (41.8)	5 (27.1)	87.60	<0.001			
regularly purchasing F&V is advantageous.	7 (69.2)	6 (41.0)	5 (28.2)	105.43	<0.001			
regularly purchasing F&V is acceptable.	7 (64.4)	6 (43.4)	6 (31.8)	90.97	<0.001			
regularly purchasing F&V is important.	7 (74.0)	7 (45.1)	6 (31.8)	86.41	<0.001			

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#### Table 25. Cluster analysis for Italian SFSCs consumers

Factor 2: Purchasing motives





MED-LINKS PRIMA project	Deliverable 1.3	<ul> <li>Consumer report on attrib</li> </ul>	oute appreciation a	nd willingness to pay
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Giving more vitamins and minerals.	7 (83.7)	7 (51.6)	7 (32.9)	67.19	< 0.001
Helping to cut down calories.	7 (67.3)	6 (37.7)	5 (30.6)	79.84	<0.001
Helping to improve body's digestive system.	7 (75.0)	6 (45.9)	6 (35.3)	107.89	<0.001
Reducing the risk of getting cancer.	7 (68.3)	6 (32.0)	4 (35.3)	90.45	<0.001
Helping to look better in appearance.	7 (70.2)	6 (42.6)	6 (32.9)	81.65	<0.001
Factor 3: Quality and taste perception					
One of the criteria for choosing F&V is freshness.	7 (73.1)	7 (45.9)	6 (28.2)	51.45	<0.001
Seasonality of F&V is important to me.	7 (77.9)	7 (50.0)	7 (28.2)	69.22	<0.001
Nutritional contents of F&V are important to me.	7 (68.3)	6 (52.5)	5 (38.8)	104.23	<0.001
The taste and flavor of F&V influences my choice.	7 (75.0)	6 (50.8)	6 (28.2)	85.43	< 0.001
The color and appearance of F&V influence my shopping choice.	7 (58.7)	6 (45.1)	6 (32.9)	71.79	<0.001
Factor 4: Health concern-confidence in fruit safety					
Paying attention to the food poisoning when buying F&V.	7 (54.8)	6 (36.9)	5 (29.4)	109.74	<0.001
Caring about residues of pesticides/other chemicals.	7 (60.6)	6 (42.6)	5 (27.1)	94.37	< 0.001
Caring about chemicals released from F&V packaging.	7 (68.3)	5 (32.8)	4 (27.1)	118.21	<0.001
Paying attention to the additives.	7 (72.1)	6 (42.6)	5 (27.0)	108.30	<0.001
likely to purchase non-Genetic Modified F&V.	7 (64.4)	6 (39.3)	5 (27.2)	72.65	<0.001
Factor 5: important of F&V information					
Ingredients list (nutrition or vitamin facts).	6 (40.4)	5 (36.9)	4 (30.6)	96.03	<0.001
Geographical origin.	7 (50.0)	6 (41.8)	5 (45.9)	97.38	<0.001
Shelf life.	7 (43.3)	6 (49.2)	5 (34.1)	78.62	<0.001
Presence of the organic logo.	6 (48.1)	6 (45.1)	4 (38.8)	128.73	<0.001
Presence of environmental friendly production logos.	6 (46.2)	6 (43.4)	4 (43.5)	151.25	<0.001
Presence of ethical/social aspects logo.	6 (39.4)	5 (39.3)	4 (41.2)	105.01	<0.001
Factor 6: Price-consciousness scales					
When I buy F&V, I really look for specials.	6 (45.2)	5 (38.5)	4 (37.6)	65.37	<0.001
I'm willing to pay even more for the special F&V.	6 (40.4)	5 (39.3)	4 (32.9)	62.55	<0.001
I check the prices, even when I am buying inexpensive F&V.	6 (46.2)	6 (41.0)	5 (25.9)	49.31	<0.001
I often wait to purchase F&V, so I can get them on low price	6 (24.0)	4 (27.9)	4 (36.5)	14.19	<0.001

\* Results are presented as mode and its frequency in parentheses.

#### b) France

Based on the factor loading, eigenvalue, and Cronbach's alpha of the French SFSCs shown in Table 26, all 29 items can be grouped into significantly different factors.

#### Table 26. Exploratory and confirmatory factor analysis for France SFSCs consumers

Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		10.87	0.83
regularly purchasing F&V is necessary.	0.82		
regularly purchasing F&V is advantageous.	0.82		
regularly purchasing F&V is acceptable.	0.77		
regularly purchasing F&V is important.	0.86		
Factor 2: Purchasing motives		3.56	0.86
Giving more vitamins and minerals.	0.65		
Helping to cut down calories.	0.61		
Helping to improve body's digestive system.	0.62		
Reducing the risk of getting cancer.	0.73		
Helping to look better in appearance.	0.62		
Factor 3: Quality and taste perception		1.59	0.82







One of the criteria for choosing F&V is freshness.	0.60		
Seasonality of F&V is important to me.	0.60		
Nutritional contents of F&V are important to me.	0.46		
The taste and flavor of F&V influences my choice.	0.64		
The color and appearance of F&V influence my shopping choice.	0.72		
Factor 4: Health concern-confidence in fruit safety		1.28	0.86
Paying attention to the food poisoning when buying F&V.	0.68		
Caring about residues of pesticides/other chemicals.	0.69		
Caring about chemicals released from F&V packaging.	0.75		
Paying attention to the additives.	0.66		
likely to purchase non-Genetic Modified F&V.	0.53		
Factor 5: important of F&V information		1.06	0.85
Ingredients list (nutrition or vitamin facts).	0.62		
Geographical origin.	0.56		
Shelf life.	0.68		
Presence of the organic logo.	0.84		
Presence of environmental friendly production logos.	0.79		
Presence of ethical/social aspects logo.	0.70		
Factor 6: Price-consciousness scales		1.04	0.51
When I buy F&V, I really look for specials.	0.53		
I'm willing to pay even more for the special F&V.	0.58		
I check the prices, even when I am buying inexpensive F&V.	0.58		
I often wait to purchase F&V, so I can get them on low price	0.79		

French SFSCs cluster analysis resulted in three clusters based on the factors obtained from PCA in Table 27. Similar to the Italian consumers, cluster 1 had high scores on almost all items compared to the other segments. These "value seeking" consumers represented about 20.7% of the sample (N=56). The regular purchase of F&V was both necessary and advantageous for them. The most important purchase motivations for these consumers were digestive system support and vitamin and mineral intake. F&V freshness and taste were perceived as more important compared to other quality factors. In addition to food safety, they cared more on information about geographic origin, shelf life, and an environmentally friendly production logo.

The second cluster in which includes most of SFSCs participants (64%, N=173), regularly purchasing was important to them. They also gave high scores on the factors of motives to buy and perception of quality. In addition to these two factors, they gave high scores on the items of the factors health concern- confidence in the safety of F&V, such as paying attention to additives, likely to purchase non-genetic modified F&V, and concerned about pesticide/other chemical residues. This cluster can be called "rational" or "health conscious" consumers because they cared about food safety as well as food quality. Consumers who make their F&V choices and





eating habits based on logical reasoning and focus on achieving specific goals. This is the reason why product information such as geographical origin was important to them.

The third cluster with the fewest consumers (n=41, 15.2%) is referred to as "conventional" or "traditional" consumers because they gave the lowest scores for the items compared to the other two clusters. The mode scores for the items were 5 (somewhat agree).

Factors and items	Cluster 1	Cluster 2	Cluster 3	Kruskal-	Sig
	20.7%	64.1%	15.2%	Wallis H	0
	(n=56)	(n=173)	(n=41)		
Factor 1: F&V consumption habits					
regularly purchasing F&V is necessary.	7 (87.5)	7 (57.8)	5 (56.1)	98.92	<0.001
regularly purchasing F&V is advantageous.	7 (87.5)	7 (57.2)	5 (63.4)	94.23	<0.001
regularly purchasing F&V is acceptable.	7 (80.4)	7 (46.2)	5 (53.7)	86.91	<0.001
regularly purchasing F&V is important.	7 (86.0)	7 (59.5)	5 (56.1)	98.45	<0.001
Factor 2: Purchasing motives					
Giving more vitamins and minerals.	7 (91.1)	7 (50.9)	5 (51.2)	106.76	<0.001
Helping to cut down calories.	7 (83.9)	7 (33.5)	5 (53.7)	87.97	<0.001
Helping to improve body's digestive system.	7 (92.9)	7 (42.2)	5 (51.2)	110.52	<0.001
Reducing the risk of getting cancer.	7 (87.5)	6 (32.4)	5 (41.5)	84.91	<0.001
Helping to look better in appearance.	7 (89.3)	7 (32.9)	5 (51.2)	92.59	<0.001
Factor 3: Quality and taste perception					
One of the criteria for choosing F&V is freshness.	7 (92.9)	7 (46.8)	5 (43.9)	99.71	<0.001
Seasonality of F&V is important to me.	7 (82.1)	7 (54.3)	5 (56.1)	88.76	<0.001
Nutritional contents of F&V are important to me.	7 (76.8)	6 (38.2)	5 (43.9)	90.80	<0.001
The taste and flavor of F&V influences my choice.	7 (89.3)	7 (54.3)	5 (46.3)	107.33	<0.001
The color and appearance of F&V influence my shopping choice.	7 (66.1)	6 (37.6)	5 (51.2)	40.39	<0.001
Factor 4: Health concern-confidence in F&V safety					
Paying attention to the food poisoning when buying F&V.	7 (76.8)	6 (28.3)	5 (48.8)	84.45	<0.001
Caring about residues of pesticides/other chemicals.	7 (82.1)	6 (31.8)	5 (43.9)	91.88	<0.001
Caring about chemicals released from F&V packaging.	7 (82.1)	6 (28.9)	5 (58.5)	86.53	<0.001
Paying attention to the additives.	7 (91.1)	7 (32.4)	5 (53.7)	92.28	<0.001
likely to purchase non-Genetic Modified F&V.	7 (80.4)	6 (36.4)	5 (48.8)	102.23	<0.001
Factor 5: important of F&V information					
Ingredients list (nutrition or vitamin facts).	7 (48.2)	5 (28.9)	5 (41.5)	77.43	<0.001
Geographical origin.	7 (76.8)	7 (30.6)	5 (39.0)	76.12	<0.001
Shelf life.	7 (66.1)	5 (29.5)	5 (43.9)	81.73	<0.001
Presence of the organic logo.	7 (57.1)	6 (27.7)	5 (36.6)	52.97	<0.001
Presence of environmental friendly production logos.	7 (62.5)	5 (31.8)	5 (48.8)	93.23	<0.001
Presence of ethical/social aspects logo.	7 (46.4)	4 (29.5)	5 (48.8)	80.59	<0.001
Factor 6: Price-consciousness scales					
When I buy F&V, I really look for specials.	6 (55.4)	6 (35.3)	5 (41.5)	71.45	<0.001
I'm willing to pay even more for the special F&V.	6 (62.5)	6 (26.0)	4 (41.5)	56.45	<0.001
I check the prices, even when I am buying inexpensive F&V.	7 (71.4)	6 (32.9)	5 (40.0)	87.18	<0.001
I often wait to purchase F&V, so I can get them on low price	5 (39.3)	3 (21.4)	5 (46.3)	13.32	<0.001

#### Table 27. Cluster analysis for France SFSCs consumers

#### c) Greece

Based on the factor loading, eigenvalue, and Cronbach's alpha of the Greek SFSCs shown in Table 28, three items of the color and appearance of F&V from Factor 3 (quality and taste perception),





look for specials and pay even more for the special F&V from Factor 6 (Price-consciousness scales) were excluded from the cluster analysis.

Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		9.34	0.83
regularly purchasing F&V is necessary.	0.80		
regularly purchasing F&V is advantageous.	0.69		
regularly purchasing F&V is acceptable.	0.70		
regularly purchasing F&V is important.	0.76		
Factor 2: Purchasing motives		3.04	0.83
Giving more vitamins and minerals.	0.56		
Helping to cut down calories.	0.73		
Helping to improve body's digestive system.	0.56		
Reducing the risk of getting cancer.	0.78		
Helping to look better in appearance.	0.78		
Factor 3: Quality and taste perception		1.73	0.77
One of the criteria for choosing F&V is freshness.	0.69		
Seasonality of F&V is important to me.	0.61		
Nutritional contents of F&V are important to me.	0.51		
The taste and flavor of F&V influences my choice.	0.61		
The color and appearance of F&V influence my shopping choice.	0.31		
Factor 4: Health concern-confidence in fruit safety		1.54	0.83
Paying attention to the food poisoning when buying F&V.	0.69		
Caring about residues of pesticides/other chemicals.	0.61		
Caring about chemicals released from F&V packaging.	0.51		
Paying attention to the additives.	0.61		
likely to purchase non-Genetic Modified F&V.	0.69		
Factor 5: important of F&V information		1.24	0.88
Ingredients list (nutrition or vitamin facts).	0.76		
Geographical origin.	0.57		
Shelf life.	0.75		
Presence of the organic logo.	0.79		
Presence of environmental friendly production logos.	0.84		
Presence of ethical/social aspects logo.	0.78		
Factor 6: Price-consciousness scales		1.19	0.44
When I buy F&V, I really look for specials.	0.35		
I'm willing to pay even more for the special F&V.	0.39		
I check the prices, even when I am buying inexpensive F&V.	0.56		
I often wait to purchase F&V, so I can get them on low price	0.78		

Table 28. Exploratory and confirm	natory factor analys	sis for Greek SFSCs consumers
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Cluster analysis in three clusters based on the factors obtained from PCA is shown in Cluster 3 (n=107, 31.1%) is referred to as "conservative" consumers because they gave the lowest item

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scores compared to the other two clusters. Although regular purchase of food was important for them (Table 29).

Cluster 1 belongs to the "value seeking" consumers accounted for about 19.8% of the sample (N=68), similar to the Italian and French SFSCs consumers, because most items were important to them. The number of consumers in this cluster is less than the other two clusters.

Similar to France, the second cluster in which includes most of SFSCs participants (49.1%, N=169), can be described as "health conscious" consumers, since they paid more attention not only to the quality of F&V, but also to food safety.

Cluster 3 (n=107, 31.1%) is referred to as "conventional" or "traditional" consumers because they gave the lowest item scores compared to the other two clusters. Although regular purchase of food was important for them.

Factors and items	Cluster 1	Cluster 2	Cluster 3	Kruskal-	Sig
	19.8%	49.1%	31.1%	Wallis H	
	(n=68)	(n=169)	(n=107)		
Factor 1: F&V consumption habits					
regularly purchasing F&V is necessary.	7 (76.5)	6 (45.6)	5 (30.8)	52.69	<0.001
regularly purchasing F&V is advantageous.	7 (54.4)	6 (43.2)	5 (29.0)	61.49	<0.001
regularly purchasing F&V is acceptable.	7 (69.1)	6 (48.5)	6 (33.6)	66.70	<0.001
regularly purchasing F&V is important.	7 (85.3)	6 (49.1)	6 (40.2)	72.46	<0.001
Factor 2: Purchasing motives					
Giving more vitamins and minerals.	7 (98.5)	7 (52.1)	7 (41.1)	63.83	<0.001
Helping to cut down calories.	7 (73.5)	7 (40.2)	6 (30.8)	62.21	<0.001
Helping to improve body's digestive system.	7 (91.2)	7 (49.1)	6 (43.0)	74.56	<0.001
Reducing the risk of getting cancer.	7 (77.9)	6 (46.2)	4 (26.2)	77.19	<0.001
Helping to look better in appearance.	7 (83.8)	6 (43.8)	5 (32.7)	82.33	<0.001
Factor 3: Quality and taste perception					
One of the criteria for choosing F&V is freshness.	7 (58.3)	7 (48.5)	6 (34.6)	53.64	<0.001
Seasonality of F&V is important to me.	7 (80.9)	6 (46.2)	6 (43.9)	46.21	<0.001
Nutritional contents of F&V are important to me.	7 (86.8)	6 (52.7)	6 (37.4)	90.68	<0.001
The taste and flavor of F&V influences my choice.	7 (72.1)	6 (50.9)	6 (36.4)	42.69	<0.001
Factor 4: Health concern-confidence in fruit safety					
Paying attention to the food poisoning when buying F&V.	7 (51.5)	6 (46.2)	5 (28.0)	77.53	<0.001
Caring about residues of pesticides/other chemicals.	7 (85.3)	6 (47.3)	5 (32.7)	114.75	<0.001
Caring about chemicals released from F&V packaging.	7 (76.5)	6 (47.9)	5 (31.8)	120.71	<0.001
Paying attention to the additives.	7 (83.8)	6 (55.6)	5 (32.7)	135.62	<0.001
likely to purchase non-Genetic Modified F&V.	7 (89.7)	6 (41.4)	4 (30.8)	90.80	<0.001
Factor 5: important of F&V information					
Ingredients list (nutrition or vitamin facts).	7 (47.1)	6 (35.5)	4 (31.8)	115.86	<0.001
Geographical origin.	7 (61.8)	6 (47.3)	5 (33.6)	105.35	<0.001
Shelf life.	7 (55.9)	6 (46.2)	4 (32.7)	136.48	<0.001
Presence of the organic logo.	7 (57.4)	6 (36.7)	4 (34.6)	159.88	<0.001
Presence of environmental friendly production logos.	7 (50.0)	6 (36.7)	4 (31.8)	162.04	<0.001
Presence of ethical/social aspects logo.	6 (41.2)	4 (30.2)	4 (26.2)	134.29	<0.001
Factor 6: Price-consciousness scales					
I check the prices, even when I am buying inexpensive F&V.	6 (66.2)	6 (47.3)	5 (38.3)	65.50	<0.001
I often wait to purchase F&V, so I can get them on low price	7 (29.4)	6 (27.8)	4 (26.2)	14.97	<0.001

#### Table 29. Cluster analysis for Greek SFSCs consumers







#### d)Egypt

Based on the factor loading, eigenvalue, and Cronbach's alpha of the Greek SFSCs shown in Table 30, all 29 items can be grouped into significantly different factors.

#### Table 30. Exploratory and confirmatory factor analysis for Egyptian SFSCs consumers

Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		7.21	0.72
regularly purchasing F&V is necessary.	0.61		
regularly purchasing F&V is advantageous.	0.52		
regularly purchasing F&V is acceptable.	0.53		
regularly purchasing F&V is important.	0.63		
Factor 2: Purchasing motives		3.30	0.73
Giving more vitamins and minerals.	0.80		
Helping to cut down calories.	0.77		
Helping to improve body's digestive system.	0.80		
Reducing the risk of getting cancer.	0.75		
Helping to look better in appearance.	0.49		
Factor 3: Quality and taste perception		2.33	0.76
One of the criteria for choosing F&V is freshness.	0.59		
Seasonality of F&V is important to me.	0.73		
Nutritional contents of F&V are important to me.	0.76		
The taste and flavor of F&V influences my choice.	0.54		
The color and appearance of F&V influence my shopping choice.	0.63		
Factor 4: Health concern-confidence in fruit safety		1.83	0.82
Paying attention to the food poisoning when buying F&V.	0.74		
Caring about residues of pesticides/other chemicals.	0.78		
Caring about chemicals released from F&V packaging.	0.84		
Paying attention to the additives.	0.77		
likely to purchase non-Genetic Modified F&V.	0.48		
Factor 5: important of F&V information		1.49	0.86
Ingredients list (nutrition or vitamin facts).	0.77		
Geographical origin.	0.60		
Shelf life.	0.67		
Presence of the organic logo.	0.85		
Presence of environmental friendly production logos.	0.88		
Presence of ethical/social aspects logo.	0.75		
Factor 6: Price-consciousness scales		1.32	0.63
When I buy F&V, I really look for specials.	0.57		
I'm willing to pay even more for the special F&V.	0.46		
I check the prices, even when I am buying inexpensive F&V.	0.68		
I often wait to purchase F&V, so I can get them on low price	0.63		



According to cluster analysis results in Cluster 3 (n=55, 24.3%) were "conventional" or "traditional" consumers because they gave the lowest item scores compared to the other two clusters (Table 31).

The first cluster with 66 consumers (29.2%), were "value seeking" consumers.

The second cluster in which includes most of the participants in the SFSCs (49.1%, N=169), can be described as "quality-conscious" consumers, as they paid more attention to quality and taste perception, including freshness, seasonality, nutritional content, taste, and appearance. Consumers who perceived F&V consumption as necessary, advantageous, acceptable, and important. In addition, for these consumers, shelf life was an important piece of information when purchasing F&V.

Cluster 3 (n=55, 24.3%) were "conventional" or "traditional" consumers because they gave the lowest item scores compared to the other two clusters.

Factors and items	Cluster 1	Cluster 2	Cluster 3	Kruskal-	Sig
	29.2%	46.5%	24.3%	Wallis H	- 0
	(n=66)	(n=105)	(n=55)		
Factor 1: F&V consumption habits	<u> </u>	( )	( <i>i</i>		
regularly purchasing F&V is necessary.	7 (62.1)	7 (61.0)	6 (45.5)	9.53	0.009
regularly purchasing F&V is advantageous.	7 (68.2)	7 (63.8)	6 (43.6)	11.76	0.003
regularly purchasing F&V is acceptable.	7 (63.6)	7 (45.7)	5 (30.9)	21.53	<0.001
regularly purchasing F&V is important.	7 (77.3)	7 (61.0)	6 (49.1)	12.93	0.002
Factor 2: Purchasing motives					
Giving more vitamins and minerals.	7 (84.8)	7 (68.6)	5 (56.4)	12.70	0.002
Helping to cut down calories.	7 (72.7)	7 (53.3)	6 (50.9)	27.08	<0.001
Helping to improve body's digestive system.	7 (77.3)	7 (71.4)	5 (45.5)	17.39	<0.001
Reducing the risk of getting cancer.	7 (71.2)	7 (62.9)	5 (47.3)	9.53	0.009
Helping to look better in appearance.	7 (80.3)	7 (65.7)	6 (49.1)	15.74	<0.001
Factor 3: Quality and taste perception					
One of the criteria for choosing F&V is freshness.	7 (72.7)	7 (47.6)	5 (52.7)	11.91	0.003
Seasonality of F&V is important to me.	7 (75.8)	7 (50.5)	6 (41.8)	19.17	<0.001
Nutritional contents of F&V are important to me.	7 (81.8)	7 (48.6)	6 (41.8)	28.28	<0.001
The taste and flavour of F&V influences my choice.	7 (66.7)	7 (49.5)	6 (49.1)	7.77	0.021
The color and appearance of F&V influence my shopping choice.	7 (66.7)	7 (47.6)	5 (43.6)	10.04	0.007
Factor 4: Health concern-confidence in fruit safety					
Paying attention to the food poisoning when buying F&V.	7 (72.7)	7 (42.9)	5 (29.1)	34.49	<0.001
Caring about residues of pesticides/other chemicals.	7 (80.3)	6 (42.5)	6 (29.0)	59.52	<0.001
Caring about chemicals released from F&V packaging.	7 (71.2)	6 (41.9)	6 (36.4)	41.33	<0.001
Paying attention to the additives.	7 (65.2)	6 (42.9)	5 (36.4)	31.12	<0.001
likely to purchase non-Genetic Modified F&V.	7 (51.5)	6 (39.0)	5 (35.2)	36.41	<0.001
Factor 5: important of F&V information					
Ingredients list (nutrition or vitamin facts).	7 (68.2)	6 (45.7)	5 (29.1)	86.84	<0.001
Geographical origin.	7 (59.1)	6 (45.0)	5 (27.3)	93.12	<0.001
Shelf life.	7 (77.3)	7 (59.0)	6 (43.6)	19.57	<0.001
Presence of the organic logo.	7 (50.0)	6 (43.8)	5 (52.7)	63.72	<0.001
Presence of environmental friendly production logos.	7 (65.2)	6 (47.6)	4 (32.7)	85.22	<0.001

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#### Table 31. Cluster analysis for Egyptian SFSCs consumers







Presence of ethical/social aspects logo.	7 (63.6)	6 (46.7)	4 (30.9)	84.46	<0.001
Factor 6: Price-consciousness scales					
When I buy F&V, I really look for specials.	6 (72.7)	6 (53.3)	5 (38.2)	58.41	<0.001
I'm willing to pay even more for the special F&V.	7 (54.5)	6 (46.7)	6 (41.8)	36.92	<0.001
I check the prices, even when I am buying inexpensive F&V.	5 (57.6)	6 (49.5)	5 (38.2)	65.45	<0.001
I often wait to purchase F&V, so I can get them on low price	7 (63.6)	6 (28.6)	3 (25.5)	106.57	<0.001

#### e) Morocco

Based on the factor loading, eigenvalue, and Cronbach's alpha of the Greek SFSCs shown in Table 32, all 29 items can be grouped into significantly different factors.

	Table 32. Exploratory a	and confirmatory	/ factor analy	sis for Moroccan	SFSCs consumers
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Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		10.04	0.83
regularly purchasing F&V is necessary.	0.53		
regularly purchasing F&V is advantageous.	0.71		
regularly purchasing F&V is acceptable.	0.83		
regularly purchasing F&V is important.	0.76		
Factor 2: Purchasing motives		3.18	0.84
Giving more vitamins and minerals.	0.69		
Helping to cut down calories.	0.61		
Helping to improve body's digestive system.	0.74		
Reducing the risk of getting cancer.	0.73		
Helping to look better in appearance.	0.72		
Factor 3: Quality and taste perception		1.55	0.80
One of the criteria for choosing F&V is freshness.	0.72		
Seasonality of F&V is important to me.	0.68		
Nutritional contents of F&V are important to me.	0.57		
The taste and flavor of F&V influences my choice.	0.63		
The color and appearance of F&V influence my shopping choice.	0.59		
Factor 4: Health concern-confidence in fruit safety		1.39	0.84
Paying attention to the food poisoning when buying F&V.	0.66		
Caring about residues of pesticides/other chemicals.	0.83		
Caring about chemicals released from F&V packaging.	0.82		
Paying attention to the additives.	0.67		
likely to purchase non-Genetic Modified F&V.	0.40		
Factor 5: important of F&V information		1.26	0.86
Ingredients list (nutrition or vitamin facts).	0.64		
Geographical origin.	0.61		
Shelf life.	0.65		
Presence of the organic logo.	0.82		
Presence of environmental friendly production logos.	0.86		
Presence of ethical/social aspects logo.	0.81		
Factor 6: Price-consciousness scales		1.23	0.51
When I buy F&V, I really look for specials.	0.59		
I'm willing to pay even more for the special F&V.	0.40		
I check the prices, even when I am buying inexpensive F&V.	0.67		
I often wait to purchase F&V, so I can get them on low price	0.76		





According to cluster analysis of Moroccan SFSCs consumers in Cluster 3 (n=55, 24.3%) were "conventional" or "traditional" consumers because they gave the lowest item scores compared to the other two clusters (Table 31).

The first cluster with 95 consumers (39.7%), were "value seeking" consumers.

Cluster 2 (42.7%, N=102) can be described as "health conscious", as they were more concerned about the safety of F&V, including pesticide/other chemical residues and chemicals released from F&V packaging. Consumers who perceived the consumption of F&V as necessary and advantageous.

Cluster 3 (n=42, 17.6%) as "quality conscious" consumers paid more attention to quality and taste perception, including freshness, seasonality, nutritional content, taste, and appearance. In addition, this consumer group was aware of the benefits of F&V consumption, as they assigned high scores to the corresponding items in Factor 2.

Factors and items	Cluster 1	Cluster 2	Cluster 3	Kruskal-	Sig
	39.7%	42.7%	17.6%	Wallis H	
	(n=95)	(n=102)	(n=42)		
Factor 1: F&V consumption habits	( /	( - )	. ,		
regularly purchasing F&V is necessary.	7 (70.5)	7 (35.3)	7 (42.9)	32.15	<0.001
regularly purchasing F&V is advantageous.	7 (72.6)	7 (42.2)	7 (45.2)	22.24	<0.001
regularly purchasing F&V is acceptable.	7 (53.7)	6 (41.2)	7 (42.9)	15.75	<0.001
regularly purchasing F&V is important.	7 (75.8)	6 (36.3)	7 (47.6)	39.77	<0.001
Factor 2: Purchasing motives					
Giving more vitamins and minerals.	7 (76.8)	7 (46.1)	7 (59.5)	21.51	<0.001
Helping to cut down calories.	7 (50.5)	6 (44.1)	7 (28.6)	24.24	<0.001
Helping to improve body's digestive system.	7 (63.2)	6 (43.1)	7 (50.0)	18.76	<0.001
Reducing the risk of getting cancer.	7 (65.3)	6 (47.1)	7 (38.1)	36.25	<0.001
Helping to look better in appearance.	7 (64.2)	6 (40.2)	7 (40.5)	25.10	<0.001
Factor 3: Quality and taste perception					
One of the criteria for choosing F&V is freshness.	7 (68.4)	7 (35.3)	7 (50.0)	25.69	<0.001
Seasonality of F&V is important to me.	7 (64.2)	6 (46.1)	7 (38.1)	36.76	<0.001
Nutritional contents of F&V are important to me.	7 (56.8)	6 (38.2)	5 (38.1)	36.63	<0.001
The taste and flavor of F&V influences my choice.	7 (56.8)	6 (44.1)	7 (45.2)	21.32	<0.001
The color and appearance of F&V influence my shopping choice.	7 (48.4)	6 (46.1)	7 (31.0)	17.03	<0.001
Factor 4: Health concern-confidence in fruit safety					
Paying attention to the food poisoning when buying F&V.	7 (63.2)	6 (41.2)	5 (28.6)	56.28	<0.001
Caring about residues of pesticides/other chemicals.	7 (65.3)	7 (49.0)	5 (21.4)	65.66	<0.001
Caring about chemicals released from F&V packaging.	7 (45.3)	7 (55.1)	3 (23.8)	69.73	<0.001
Paying attention to the additives.	7 (67.4)	6 (37.3)	5 (33.3)	64.95	<0.001
likely to purchase non-Genetic Modified F&V.	7 (54.7)	6 (31.4)	5 (28.6)	55.01	<0.001
Factor 5: important of F&V information					
Ingredients list (nutrition or vitamin facts).	6 (38.9)	6 (40.2)	5 (26.2)	60.71	<0.001
Geographical origin.	6 (41.1)	5 (33.3)	3 (23.8)	66.32	<0.001
Shelf life.	7 (64.2)	6 (35.3)	5 (23.8)	54.71	<0.001
Presence of the organic logo.	7 (49.5)	6 (36.3)	4 (33.3)	88.75	<0.001
Presence of environmental friendly production logos.	7 (49.5)	5 (30.4)	4 (35.7)	115.92	<0.001
Presence of ethical/social aspects logo.	7 (38.9)	6 (37.3)	1 (26.2)	78.35	<0.001
Factor 6: Price-consciousness scales	*	-	-		

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#### Table 33. Cluster analysis for Moroccan SFSCs consumers





When I buy F&V, I really look for specials.	7 (43.2)	6 (53.9)	5 (26.2)	35.69	<0.001
I'm willing to pay even more for the special F&V.	6 (44.1)	6 (35.8)	5 (31.0)	33.94	<0.001
I check the prices, even when I am buying inexpensive F&V.	7 (43.2)	6 (38.2)	5 (33.3)	22.66	< 0.001
I often wait to purchase F&V, so I can get them on low price	6 (23.2)	6 (31.4)	3 (26.2)	26.91	<0.001

#### 4.4.2. Green public procurement (FR, IT)

The results of GPP consumer clustering are presented separately for Italy and France. Before that, the results of the KMO and Bartlett's tests are presented in Table 34. According to the results of KMO and Bartlett's tests, the data are suitable and appropriate for factor analysis.

#### Table 34. KMO and Bartlett's Test in GPP factor analysis

	Italy	France
KMO measure of Sampling Adequacy	0.923	0.934
Bartlett's Test (Approx. Chi-Square)	4715.845	5781.594
Sig.	0.000	0.000

#### a) Italy

Based on the factor loading, eigenvalue, and Cronbach's alpha of the Greek SFSCs shown in Table 35, all 29 items can be grouped into significantly different factors.

Tab	le 35. Ex	ploratory	and con	firmatory	factor a	nalysis f	for Italian	GPP	consumers
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Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		11.93	0.91
regularly purchasing F&V is necessary.	0.87		
regularly purchasing F&V is advantageous.	0.87		
regularly purchasing F&V is acceptable.	0.82		
regularly purchasing F&V is important.	0.89		
Factor 2: Purchasing motives		3.20	0.88
Giving more vitamins and minerals.	0.72		
Helping to cut down calories.	0.75		
Helping to improve body's digestive system.	0.77		
Reducing the risk of getting cancer.	0.74		
Helping to look better in appearance.	0.71		
Factor 3: Quality and taste perception		1.87	0.88
One of the criteria for choosing F&V is freshness.	0.58		
Seasonality of F&V is important to me.	0.58		
Nutritional contents of F&V are important to me.	0.60		
The taste and flavor of F&V influences my choice.	0.66		
The color and appearance of F&V influence my shopping choice.	0.54		
Factor 4: Health concern-confidence in fruit safety		1.44	0.89
Paying attention to the food poisoning when buying F&V.	0.66		
Caring about residues of pesticides/other chemicals.	0.78		
Caring about chemicals released from F&V packaging.	0.77		
Paying attention to the additives.	0.72		
likely to purchase non-Genetic Modified F&V.	0.60		
Factor 5: important of F&V information		1.10	0.91
Ingredients list (nutrition or vitamin facts).	0.69		





Geographical origin.	0.61		
Shelf life.	0.77		
Presence of the organic logo.	0.75		
Presence of environmental friendly production logos.	0.82		
Presence of ethical/social aspects logo.	0.81		
Factor 6: Price-consciousness scales		1.07	0.64
Factor 6: Price-consciousness scales When I buy F&V, I really look for specials.	0.69	1.07	0.64
Factor 6: Price-consciousness scales When I buy F&V, I really look for specials. I'm willing to pay even more for the special F&V.	0.69 0.70	1.07	0.64
Factor 6: Price-consciousness scales When I buy F&V, I really look for specials. I'm willing to pay even more for the special F&V. I check the prices, even when I am buying inexpensive F&V.	0.69 0.70 0.51	1.07	0.64

The results of the cluster analysis of Italian GPP consumers are shown in Table 36. The first cluster, with 112 consumers (49.1%) as the largest cluster, was "value seeking" consumers.

Cluster 2 (43%, N=98) can be described as "quality conscious" consumers paid more attention to quality and taste perception, including freshness, seasonality, nutritional content, taste, and appearance. In addition, this consumer group emphasized the benefits of fruit consumption with high scores on the corresponding items in Factor 2.

Cluster 3 which included a small number of consumers (n=18, 7.9%) is called "conventional" or "traditional" consumers because they gave the lowest item scores compared to the other two clusters.

Factors and items	Cluster 1	Cluster 2	Cluster 3	Kruskal-	Sig
	49.1%	43.0%	7.9%	Wallis H	
	(n=112)	(n=98)	(n=18)		
Factor 1: F&V consumption habits					
regularly purchasing F&V is necessary.	7 (64.3)	6 (40.8)	4 (33.3)	67.21	<0.001
regularly purchasing F&V is advantageous.	7 (50.9)	6 (37.8)	4 (38.9)	64.01	<0.001
regularly purchasing F&V is acceptable.	7 (45.5)	6 (40.8)	3 (27.8)	46.47	<0.001
regularly purchasing F&V is important.	7 (63.4)	6 (39.8)	4 (44.4)	67.12	<0.001
Factor 2: Purchasing motives					
Giving more vitamins and minerals.	7 (75.0)	7 (37.8)	3 (27.8)	83.70	<0.001
Helping to cut down calories.	7 (49.1)	5 (35.7)	3 (38.9)	46.54	<0.001
Helping to improve body's digestive system.	7 (59.8)	6 (37.8)	4 (44.4)	66.15	<0.001
Reducing the risk of getting cancer.	7 (48.2)	6 (34.7)	4 (55.6)	48.65	<0.001
Helping to look better in appearance.	7 (61.6)	6 (41.8)	4 (55.6)	82.87	<0.001
Factor 3: Quality and taste perception					
One of the criteria for choosing F&V is freshness.	7 (60.7)	6 (38.8)	3 (27.8)	64.29	<0.001
Seasonality of F&V is important to me.	7 (63.4)	6 (36.7)	4 (66.7)	77.92	<0.001
Nutritional contents of F&V are important to me.	7 (51.8)	6 (37.8)	4 (44.4)	77.43	<0.001
The taste and flavor of F&V influences my choice.	7 (60.7)	6 (46.9)	4 (40.5)	62.52	<0.001
The color and appearance of F&V influence my shopping choice.	7 (42.0)	6 (40.8)	4 (44.4)	45.05	<0.001
Factor 4: Health concern-confidence in fruit safety					
Paying attention to the food poisoning when buying F&V.	7 (44.6)	5 (28.6)	4 (43.2)	87.23	<0.001
Caring about residues of pesticides/other chemicals.	7 (55.4)	5 (36.7)	5 (38.9)	98.35	<0.001
Caring about chemicals released from F&V packaging.	7 (51.8)	5 (36.7)	4 (55.6)	108.05	<0.001
Paying attention to the additives.	7 (51.8)	5 (34.7)	4 (44.4)	83.16	<0.001
likely to purchase non-Genetic Modified F&V.	7 (50.2)	5 (34.7)	4 (43.3)	80.27	<0.001

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#### Table 36. Cluster analysis for Italian GPP consumers

Factor 5: important of F&V information





Ingredients list (nutrition or vitamin facts).	6 (36.6)	5 (33.5)	4 (38.9)	69.97	<0.001
Geographical origin.	7 (45.5)	5 (45.9)	4 (38.9)	82.20	<0.001
Shelf life.	6 (39.3)	6 (32.7)	4 (35.3)	47.16	<0.001
Presence of the organic logo.	6 (42.9)	5 (29.6)	4 (33.3)	72.35	<0.001
Presence of environmental friendly production logos.	6 (47.3)	5 (31.6)	4 (50.0)	79.79	<0.001
Presence of ethical/social aspects logo.	6 (37.5)	6 (23.5)	4 (61.1)	61.34	<0.001
Factor 6: Price-consciousness scales					
When I buy F&V, I really look for specials.	6 (45.5)	5 (41.8)	4 (38.9)	56.04	<0.001
I'm willing to pay even more for the special F&V.	6 (39.3)	5 (31.6)	4 (55.6)	56.82	<0.001
I check the prices, even when I am buying inexpensive F&V.	6 (44.6)	5 (33.7)	4 (44.4)	50.89	<0.001
I often wait to purchase F&V, so I can get them on low price	6 (26.8)	5 (22.4)	4 (40.1)	82.10	<0.001

#### b) France

According to Table 37, all 29 items of French GPP consumers can be grouped into significantly different factors.

#### Table 37. Exploratory and confirmatory factor analysis for France GPP consumers

Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		12.20	0.89
regularly purchasing F&V is necessary.	0.77		
regularly purchasing F&V is advantageous.	0.79		
regularly purchasing F&V is acceptable.	0.72		
regularly purchasing F&V is important.	0.77		
Factor 2: Purchasing motives		2.94	0.85
Giving more vitamins and minerals.	0.62		
Helping to cut down calories.	0.62		
Helping to improve body's digestive system.	0.64		
Reducing the risk of getting cancer.	0.77		
Helping to look better in appearance.	0.57		
Factor 3: Quality and taste perception		1.42	0.84
One of the criteria for choosing F&V is freshness.	0.57		
Seasonality of F&V is important to me.	0.66		
Nutritional contents of F&V are important to me.	0.54		
The taste and flavor of F&V influences my choice.	0.64		
The color and appearance of F&V influence my shopping choice.	0.49		
Factor 4: Health concern-confidence in fruit safety		1.25	0.90
Paying attention to the food poisoning when buying F&V.	0.70		
Caring about residues of pesticides/other chemicals.	0.77		
Caring about chemicals released from F&V packaging.	0.80		
Paying attention to the additives.	0.76		
likely to purchase non-Genetic Modified F&V.	0.62		
Factor 5: important of F&V information		1.12	0.89
Ingredients list (nutrition or vitamin facts).	0.50		
Geographical origin.	0.56		
Shelf life.	0.68		
Presence of the organic logo.	0.85		
Presence of environmental friendly production logos.	0.81		
Presence of ethical/social aspects logo.	0.74		
Factor 6: Price-consciousness scales		1.06	0.60
When I buy F&V, I really look for specials.	0.45		







I'm willing to pay even more for the special F&V.	0.41
I check the prices, even when I am buying inexpensive F&V.	0.56
I often wait to purchase F&V, so I can get them on low price	0.88

According to the results of the cluster analysis of French GPP consumers in Table 38, the first cluster, with 138 consumers (45.1%) as the largest cluster, was "value seeking" consumers. Cluster 2 (38.2%, N=117) can be described as "quality conscious" consumers paid more attention to quality and taste perception, including freshness, seasonality, nutritional content, taste, and appearance. In addition, this consumer group emphasized the benefits of fruit consumption with high scores on the corresponding items in Factor 2.

Cluster 3 which included a small number of consumers (n=18, 7.9%) is called "conventional" or "traditional" consumers because they gave the lowest item scores compared to the other two clusters.

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Factors and items	Cluster 1 45.1%	Cluster 2 38.2%	Cluster 3 16.7%	Kruskal- Wallis H	Sig
Factor 1: F&V consumption habits         regularly purchasing F&V is necessary.       7 (67.7)       7 (33.3)       5 (33.3)       78.59       <0.001		(n=138)	(n=117)	(n=51)		
regularly purchasing F&V is necessary.       7 (67.4)       7 (33.3)       5 (33.3)       78.59       <0.001	Factor 1: F&V consumption habits					
regularly purchasing F&V is advantageous.       7 (66.7)       7 (35.9)       5 (31.4)       69.21       <0.001	regularly purchasing F&V is necessary.	7 (67.4)	7 (33.3)	5 (33.3)	78.59	<0.001
regularly purchasing F&V is acceptable.       7 (58.7)       5 (35.0)       5 (35.3)       99.64       <0.001	regularly purchasing F&V is advantageous.	7 (66.7)	7 (35.9)	5 (31.4)	69.21	<0.001
regularly purchasing F&V is important.       7 (70.3)       7 (40.2)       5 (35.3)       70.65       <0.001	regularly purchasing F&V is acceptable.	7 (58.7)	5 (35.0)	5 (35.3)	99.64	<0.001
Factor 2: Purchasing motives       7 (65.9)       6 (39.3)       4 (31.4)       11.45       <0.001	regularly purchasing F&V is important.	7 (70.3)	7 (40.2)	5 (35.3)	70.65	< 0.001
Giving more vitamins and minerals.       7 (65.9)       6 (39.3)       4 (31.4)       11.45       <0.001	Factor 2: Purchasing motives					
Helping to cut down calories.       7 (58.7)       5 (35.9)       4 (41.2)       127.69       <0.001	Giving more vitamins and minerals.	7 (65.9)	6 (39.3)	4 (31.4)	11.45	< 0.001
Helping to improve body's digestive system.       7 (60.1)       5 (30.8)       4 (29.4)       89.03       <0.001	Helping to cut down calories.	7 (58.7)	5 (35.9)	4 (41.2)	127.69	< 0.001
Reducing the risk of getting cancer.       7 (54.3)       5 (28.2)       4 (47.1)       99.68       <0.001	Helping to improve body's digestive system.	7 (60.1)	5 (30.8)	4 (29.4)	89.03	<0.001
Helping to look better in appearance.7 (60.9)5 (45.3)4 (43.1)127.67<0.001Factor 3: Quality and taste perception	Reducing the risk of getting cancer.	7 (54.3)	5 (28.2)	4 (47.1)	99.68	<0.001
Factor 3: Quality and taste perception         One of the criteria for choosing F&V is freshness.       7 (55.1)       6 (31.6)       4 (41.2)       81.52       <0.001	Helping to look better in appearance.	7 (60.9)	5 (45.3)	4 (43.1)	127.67	<0.001
One of the criteria for choosing F&V is freshness.       7 (55.1)       6 (31.6)       4 (41.2)       81.52       <0.001	Factor 3: Quality and taste perception					
Seasonality of F&V is important to me.       7 (50.7)       5 (31.6)       4 (29.4)       72.96       <0.001	One of the criteria for choosing F&V is freshness.	7 (55.1)	6 (31.6)	4 (41.2)	81.52	<0.001
Nutritional contents of F&V are important to me.       7 (55.1)       5 (35.9)       4 (39.2)       137.96       <0.001	Seasonality of F&V is important to me.	7 (50.7)	5 (31.6)	4 (29.4)	72.96	< 0.001
The taste and flavor of F&V influences my choice.       7 (70.3)       6 (33.3)       4 (27.5)       97.83       <0.001	Nutritional contents of F&V are important to me.	7 (55.1)	5 (35.9)	4 (39.2)	137.96	<0.001
The color and appearance of F&V influence my shopping choice.       7 (55.8)       5 (31.6)       5 (31.4)       95.46       <0.001         Factor 4: Health concern-confidence in fruit safety       Paying attention to the food poisoning when buying F&V.       7 (48.6)       5 (35.0)       4 (41.2)       116.93       <0.001         Caring about residues of pesticides/other chemicals.       7 (48.6)       5 (36.8)       4 (37.3)       116.98       <0.001         Caring about chemicals released from F&V packaging.       7 (46.4)       5 (29.9)       4 (35.3)       110.70       <0.001         Paying attention to the additives.       7 (49.3)       5 (36.8)       4 (41.2)       115.36       <0.001         Ikely to purchase non-Genetic Modified F&V.       7 (45.7)       5 (36.8)       4 (43.1)       108.55       <0.001         Factor 5: important of F&V information       Ingredients list (nutrition or vitamin facts).       6 (37.7)       5 (36.8)       4 (43.1)       125.01       <0.001         Geographical origin.       7 (45.7)       5 (43.6)       4 (37.3)       107.02       <0.001         Presence of the organic logo.       7 (41.3)       5 (29.9)       4 (43.1)       125.01       <0.001         Presence of environmental friendly production logos.       6 (37.7)       5 (43.6)       4 (37.3)       107.0	The taste and flavor of F&V influences my choice.	7 (70.3)	6 (33.3)	4 (27.5)	97.83	< 0.001
Factor 4: Health concern-confidence in fruit safety         Paying attention to the food poisoning when buying F&V.       7 (48.6)       5 (35.0)       4 (41.2)       116.93       <0.001	The color and appearance of F&V influence my shopping choice.	7 (55.8)	5 (31.6)	5 (31.4)	95.46	<0.001
Paying attention to the food poisoning when buying F&V.       7 (48.6)       5 (35.0)       4 (41.2)       116.93       <0.001	Factor 4: Health concern-confidence in fruit safety					
Caring about residues of pesticides/other chemicals.       7 (48.6)       5 (36.8)       4 (37.3)       116.98       <0.001	Paying attention to the food poisoning when buying F&V.	7 (48.6)	5 (35.0)	4 (41.2)	116.93	< 0.001
Caring about chemicals released from F&V packaging.       7 (46.4)       5 (29.9)       4 (35.3)       110.70       <0.001	Caring about residues of pesticides/other chemicals.	7 (48.6)	5 (36.8)	4 (37.3)	116.98	< 0.001
Paying attention to the additives.       7 (49.3)       5 (36.8)       4 (41.2)       115.36       <0.001	Caring about chemicals released from F&V packaging.	7 (46.4)	5 (29.9)	4 (35.3)	110.70	< 0.001
likely to purchase non-Genetic Modified F&V.       7 (45.7)       5 (34.2)       4 (43.1)       108.55       <0.001	Paying attention to the additives.	7 (49.3)	5 (36.8)	4 (41.2)	115.36	<0.001
Factor 5: important of F&V information         Ingredients list (nutrition or vitamin facts).       6 (37.7)       5 (36.8)       4 (43.1)       125.01       <0.001	likely to purchase non-Genetic Modified F&V.	7 (45.7)	5 (34.2)	4 (43.1)	108.55	<0.001
Ingredients list (nutrition or vitamin facts).       6 (37.7)       5 (36.8)       4 (43.1)       125.01       <0.001	Factor 5: important of F&V information					
Geographical origin.       7 (45.7)       5 (43.6)       4 (37.3)       107.02       <0.001	Ingredients list (nutrition or vitamin facts).	6 (37.7)	5 (36.8)	4 (43.1)	125.01	< 0.001
Shelf life.       6 (39.9)       5 (41.0)       4 (39.2)       102.99       <0.001	Geographical origin.	7 (45.7)	5 (43.6)	4 (37.3)	107.02	<0.001
Presence of the organic logo.       7 (41.3)       5 (29.9)       4 (29.4)       112.89       <0.001	Shelf life.	6 (39.9)	5 (41.0)	4 (39.2)	102.99	<0.001
Presence of environmental friendly production logos.         6 (42.0)         5 (44.4)         4 (35.3)         133.41         <0.001           Presence of ethical/social aspects logo.         6 (37.7)         103.70         <0.001	Presence of the organic logo.	7 (41.3)	5 (29.9)	4 (29.4)	112.89	<0.001
Presence of ethical/social aspects logo. 6 (37.7) 103.70 <0.001	Presence of environmental friendly production logos.	6 (42.0)	5 (44.4)	4 (35.3)	133.41	<0.001
	Presence of ethical/social aspects logo.	6 (37.7)			103.70	<0.001

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#### Table 38. Cluster analysis for France GPP consumers

Factor 6: Price-consciousness scales





When I buy F&V, I really look for specials.	6 (46.4)	5 (36.8)	4 (37.3)	126.69	< 0.001
I'm willing to pay even more for the special F&V.	7 (38.4)	5 (40.2)	4 (52.9)	125.92	< 0.001
I check the prices, even when I am buying inexpensive F&V.	7 (44.9)	5 (28.2)	4 (45.1)	69.22	< 0.001
I often wait to purchase F&V, so I can get them on low price	6 (26.1)	5 (32.5)	4 (35.3)	22.89	<0.001

#### 4.4.3. Export-oriented supply chain (GR, FR, IT)

The results of EOSC consumer clustering are presented separately for Italy, France, and Greece. Before that, the results of the KMO and Bartlett's tests are presented in Table 39. According to the results of KMO and Bartlett's tests, the data are suitable and appropriate for factor analysis.

#### Table 39. KMO and Bartlett's Test in GPP factor analysis

	Italy	France	Greece
KMO measure of Sampling Adequacy	0.901	0.916	0.895
Bartlett's Test (Approx. Chi-Square)	4034.563	6099.105	3162.182
Sig.	0.000	0.000	0.000

#### a) Italy

According to Table 40, 28 items of factors for French GPP consumers can be grouped into significantly different factors and one of the factor 6 item (I often wait to purchase F&V, so I can get them on low price) was excluded from the analysis.

Table 40. Exploratory a	and confirmatory	v factor analysis for	Italian EOSC consumers
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Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		10.33	0.89
regularly purchasing F&V is necessary.	0.83		
regularly purchasing F&V is advantageous.	0.82		
regularly purchasing F&V is acceptable.	0.77		
regularly purchasing F&V is important.	0.87		
Factor 2: Purchasing motives		3.59	0.85
Giving more vitamins and minerals.	0.73		
Helping to cut down calories.	0.63		
Helping to improve body's digestive system.	0.78		
Reducing the risk of getting cancer.	0.60		
Helping to look better in appearance.	0.65		
Factor 3: Quality and taste perception		1.87	0.82
One of the criteria for choosing F&V is freshness.	0.75		
Seasonality of F&V is important to me.	0.59		
Nutritional contents of F&V are important to me.	0.54		
The taste and flavor of F&V influences my choice.	0.72		
The color and appearance of F&V influence my shopping choice.	0.57		
Factor 4: Health concern-confidence in fruit safety		1.55	0.90
Paying attention to the food poisoning when buying F&V.	0.78		
Caring about residues of pesticides/other chemicals.	0.83		
Caring about chemicals released from F&V packaging.	0.85		
Paying attention to the additives.	0.80		
likely to purchase non-Genetic Modified F&V.	0.50		
Factor 5: important of F&V information		1.26	0.89







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Ingredients list (nutrition or vitamin facts).	0.58		
Geographical origin.	0.76		
Shelf life.	0.70		
Presence of the organic logo.	0.71		
Presence of environmental friendly production logos.	0.79		
Presence of ethical/social aspects logo.	0.69		
Factor 6: Price-consciousness scales		1.14	0.54
When I buy F&V, I really look for specials.	0.73		
I'm willing to pay even more for the special F&V.	0.72		
I check the prices, even when I am buying inexpensive F&V.	0.51		
I often wait to purchase F&V, so I can get them on low price	0.31		

According to the results of the cluster analysis for Italian EOSC consumers in Table 41, the first cluster, with 31 consumers (14.3%) as the smallest cluster, was "value seeking" consumers.

Cluster 2 (35.9%, N=78) is called "conventional" or "traditional" consumers because they gave the lowest item scores compared to the other two clusters. This group can also be called "conservative" consumers, as the item "check prices even when buying inexpensive F&V" was received a high score.

Cluster 3 (n=108, 49.8%) can be described as "quality conscious" consumers paid more attention to quality and taste perception, including freshness, seasonality, nutritional content, taste, and appearance.

Factors and items	Cluster 1	Cluster 2	Cluster 3	Kruskal-	Sig
	14.3%	35.9%	49.8%	Wallis H	
	(n=31)	(n=78)	(n=108)		
Factor 1: F&V consumption habits					
regularly purchasing F&V is necessary.	7 (87.1)	6 (37.2)	6 (43.5)	38.87	< 0.001
regularly purchasing F&V is advantageous.	7 (71.0)	6 (26.9)	6 (44.4)	39.28	<0.001
regularly purchasing F&V is acceptable.	7 (74.2)	6 (33.3)	6 (48.1)	37.14	<0.001
regularly purchasing F&V is important.	7 (83.9)	6 (30.8)	7 (46.3)	30.02	<0.001
Factor 2: Purchasing motives					
Giving more vitamins and minerals.	7 (90.3)	6 (35.9)	7 (50.0)	30.19	<0.001
Helping to cut down calories.	7 (87.1)	5 (33.3)	6 (40.7)	50.18	<0.001
Helping to improve body's digestive system.	7 (83.9)	5 (34.6)	6 (38.9)	51.16	<0.001
Reducing the risk of getting cancer.	7 (80.6)	4 (29.5)	6 (39.8)	43.96	< 0.001
Helping to look better in appearance.	7 (93.5)	4 (25.6)	6 (38.5)	56.98	< 0.001
Factor 3: Quality and taste perception					
One of the criteria for choosing F&V is freshness.	7 (92.5)	6 (30.8)	7 (40.7)	36.74	< 0.001
Seasonality of F&V is important to me.	7 (74.2)	5 (29.5)	7 (38.9)	37.14	< 0.001
Nutritional contents of F&V are important to me.	7 (80.6)	4 (29.5)	6 (49.1)	76.25	<0.001
The taste and flavor of F&V influences my choice.	7 (61.3)	6 (35.9)	7 (41.7)	11.79	0.003
The color and appearance of F&V influence my shopping choice.	7 (64.5)	5 (38.5)	6 (45.4)	31.45	< 0.001
Factor 4: Health concern-confidence in fruit safety					
Paying attention to the food poisoning when buying F&V.	7 (61.3)	4 (38.5)	5 (35.2)	60.11	< 0.001
Caring about residues of pesticides/other chemicals.	7 (77.4)	4 (30.8)	6 (43.5)	74.96	<0.001
Caring about chemicals released from F&V packaging.	7 (80.6)	4 (30.8)	6 (48.1)	101.69	< 0.001
Paying attention to the additives.	7 (77.4)	4 (32.1)	6 (46.3)	91.70	<0.001
likely to purchase non-Genetic Modified F&V.	7 (80.6)	4 (35.9)	6 (39.8)	71.84	<0.001

#### Table 41. Cluster analysis for Italian EOSC consumers







Factor 5: important of F&V information					
Ingredients list (nutrition or vitamin facts).	7 (64.5)	2 (28.2)	5 (35.2)	124.57	<0.001
Geographical origin.	7 (67.7)	4 (21.8)	5 (38.0)	62.75	<0.001
Shelf life.	7 (77.4)	5 (28.2)	6 (38.9)	68.79	<0.001
Presence of the organic logo.	7 (51.6)	4 (29.5)	6 (41.7)	99.71	<0.001
Presence of environmental friendly production logos.	7 (67.7)	4 (35.9)	5 (38.0)	111.85	<0.001
Presence of ethical/social aspects logo.	7 (61.3)	4 (28.2)	4 (30.6)	98.37	<0.001
Factor 6: Price-consciousness scales					
When I buy F&V, I really look for specials.	7 (54.8)	4 (29.5)	5 (36.1)	87.17	<0.001
I'm willing to pay even more for the special F&V.	7 (51.6)	4 (28.7)	5 (27.8)	99.04	<0.001
I check the prices, even when I am buying inexpensive F&V.	7 (61.3)	7 (32.1)	6 (39.8)	15.16	<0.001

#### b) France

The results of the factor analysis for the French EOSC consumers are presented in Table 42. The results show that the 28 items of the factors for French EOSC consumers can be classified into significantly different factors and one of the items of factor 3 (the color and appearance of F&V influence my shopping choice.) was excluded from the analysis.

Table 42. Exploratory and confirmatory factor analysis for France EOSC consumers

Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		11.04	0.93
regularly purchasing F&V is necessary.	0.89		
regularly purchasing F&V is advantageous.	0.87		
regularly purchasing F&V is acceptable.	0.78		
regularly purchasing F&V is important.	0.87		
Factor 2: Purchasing motives		3.54	0.86
Giving more vitamins and minerals.	0.67		
Helping to cut down calories.	0.57		
Helping to improve body's digestive system.	0.58		
Reducing the risk of getting cancer.	0.83		
Helping to look better in appearance.	0.75		
Factor 3: Quality and taste perception		1.68	0.82
One of the criteria for choosing F&V is freshness.	0.70		
Seasonality of F&V is important to me.	0.63		
Nutritional contents of F&V are important to me.	0.45		
The taste and flavor of F&V influences my choice.	0.55		
The color and appearance of F&V influence my shopping choice.	0.35		
Factor 4: Health concern-confidence in fruit safety		1.33	0.89
Paying attention to the food poisoning when buying F&V.	0.73		
Caring about residues of pesticides/other chemicals.	0.85		
Caring about chemicals released from F&V packaging.	0.83		
Paying attention to the additives.	0.67		
likely to purchase non-Genetic Modified F&V.	0.61		
Factor 5: important of F&V information		1.21	0.90
Ingredients list (nutrition or vitamin facts).	0.77		
Geographical origin.	0.70		
Shelf life.	0.62		
Presence of the organic logo.	0.82		
Presence of environmental friendly production logos.	0.87		
Presence of ethical/social aspects logo.	0.78		





Factor 6: Price-consciousness scales		1.08	0.46
When I buy F&V, I really look for specials.	0.43		
I'm willing to pay even more for the special F&V.	0.54		
I check the prices, even when I am buying inexpensive F&V.	0.57		
I often wait to purchase F&V, so I can get them on low price	0.79		

According to the results of the cluster analysis for French EOSC consumers in Table 43, the first cluster, with 72 consumers (22.9%) as the smallest cluster, was "value seeking" consumers. Cluster 2 (N=136, 43.3%,) can be described as "quality conscious" consumers paid more attention to quality and taste perception, including seasonality, nutritional content, taste, and appearance.

Cluster 3 (n=106, 33.8%) is called "conventional" or "traditional" consumers because they gave the lowest item scores compared to the other two clusters. This group can also be called "conservative" consumers, as the item "check prices even when buying inexpensive F&V" was received a high score.

#### Cluster 2 Kruskal-Factors and items Cluster 1 Cluster 3 Sig 22.9% 43.3% 33.8% Wallis H (n=72) (n=136) (n=106) Factor 1: F&V consumption habits regularly purchasing F&V is necessary. 5 (36.0) 7 (34.0) 54.12 < 0.001 7 (72.2) regularly purchasing F&V is advantageous. 7 (76.4) 5 (34.6) 7 (40.6) 46.62 < 0.001 regularly purchasing F&V is acceptable. 7 (70.8) 6 (34.6) 6 (31.1) 46.20 < 0.001 7 (76.4) regularly purchasing F&V is important. 5 (39.0) 7 (39.6) 58.87 < 0.001 Factor 2: Purchasing motives Giving more vitamins and minerals. 5 (38.2) 7 (33.0) 44.84 < 0.001 7 (72.2) Helping to cut down calories. < 0.001 5 (37.5) 4 (36.8) 51.44 7 (62.5) Helping to improve body's digestive system. 7 (70.0) 5 (39.0) 6 (30.2) 78.18 < 0.001 Reducing the risk of getting cancer. 6 (27.9) 4 (46.2) 57.62 < 0.001 7 (56.9) Helping to look better in appearance. 47.58 < 0.001 7 (56.9) 5 (36.8) 4 (32.1) Factor 3: Quality and taste perception One of the criteria for choosing F&V is freshness. 55.96 < 0.001 7 (68.1) 5 (33.1) 7 (37.7) Seasonality of F&V is important to me. 7 (58.3) 6 (33.1) 5 (25.5) 31.09 < 0.001 Nutritional contents of F&V are important to me. 7 (54.2) 6 (36.0) 4 (36.8) 53.16 < 0.001 The taste and flavor of F&V influences my choice. < 0.001 7 (83.3) 6 (35.5) 7 (38.7) 90.35 Factor 4: Health concern-confidence in fruit safety Paying attention to the food poisoning when buying F&V. 7 (65.3) 5 (36.0) 4 (31.1) 53.44 < 0.001 Caring about residues of pesticides/other chemicals. 7 (63.9) 5 (42.6) 4 (37.7) 146.69 < 0.001 Caring about chemicals released from F&V packaging. < 0.001 7 (61.1) 5 (36.0) 4 (36.8) 153.95 Paying attention to the additives. 7 (69.4) 5 (42.6) 4 (29.2) 164.71 < 0.001 likely to purchase non-Genetic Modified F&V. 7 (47.2) 5 (42.0) 4 (37.7) 131.63 < 0.001 Factor 5: important of F&V information Ingredients list (nutrition or vitamin facts). 7 (37.5) 4 (33.1) 1 (27.4) 90.59 < 0.001 Geographical origin. 7 (48.6) 5 (53.7) 5 (26.4) 113.34 < 0.001 Shelf life. 5 (47.1) 4 (25.5) 105.72 < 0.001 7 (47.2) Presence of the organic logo. 6 (52.8) 4 (39.0) 4 (22.6) 93.12 < 0.001 Presence of environmental friendly production logos. < 0.001 7 (43.1) 4 (39.0) 4 (24.5) 120.30 < 0.001 Presence of ethical/social aspects logo. 1 (30.2) 130.58 6 (37.5) 4 (36.8)

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#### Table 43. Cluster analysis for France EOSC consumers



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MED-LINKS PRIMA project	Deliverable 1.3 - C	Consumer report on attribute	appreciation an	d willingness to pay
				0

Factor 6: Price-consciousness scales					
When I buy F&V, I really look for specials.	6 (37.5)	5 (47.8)	4 (34.9)	142.65	< 0.001
I'm willing to pay even more for the special F&V.	7 (34.7)	5 (33.1)	4 (26.4)	105.56	< 0.001
I check the prices, even when I am buying inexpensive F&V.	7 (55.6)	5 (30.9)	7 (32.1)	81.86	< 0.001
I often wait to purchase F&V, so I can get them on low price	6 (29.2)	5 (33.8)	4 (26.4)	19.81	<0.001

#### c) Greece

The results of the factor analysis for the Greek EOSC consumers are presented in Table 44. The results show that all 29 items of the factors for Greek EOSC consumers can be classified into significantly different factors.

#### Table 44. Exploratory and confirmatory factor analysis for Greek EOSC consumers

Factors	Factor	Eigen	Cronbach's
	loading	value	alpha
Factor 1: F&V consumption habits		9.85	0.81
regularly purchasing F&V is necessary.	0.78		
regularly purchasing F&V is advantageous.	0.67		
regularly purchasing F&V is acceptable.	0.65		
regularly purchasing F&V is important.	0.78		
Factor 2: Purchasing motives		2.91	0.80
Giving more vitamins and minerals.	0.65		
Helping to cut down calories.	0.71		
Helping to improve body's digestive system.	0.70		
Reducing the risk of getting cancer.	0.55		
Helping to look better in appearance.	0.71		
Factor 3: Quality and taste perception		1.39	0.81
One of the criteria for choosing F&V is freshness.	0.62		
Seasonality of F&V is important to me.	0.67		
Nutritional contents of F&V are important to me.	0.48		
The taste and flavor of F&V influences my choice.	0.52		
The color and appearance of F&V influence my shopping choice.	0.56		
Factor 4: Health concern-confidence in fruit safety		1.31	0.83
Paying attention to the food poisoning when buying F&V.	0.48		
Caring about residues of pesticides/other chemicals.	0.65		
Caring about chemicals released from F&V packaging.	0.66		
Paying attention to the additives.	0.72		
likely to purchase non-Genetic Modified F&V.	0.66		
Factor 5: important of F&V information		1.21	0.87
Ingredients list (nutrition or vitamin facts).	0.53		
Geographical origin.	0.66		
Shelf life.	0.64		
Presence of the organic logo.	0.80		
Presence of environmental friendly production logos.	0.85		
Presence of ethical/social aspects logo.	0.82		
Factor 6: Price-consciousness scales		1.19	0.52
When I buy F&V, I really look for specials.	0.51		
I'm willing to pay even more for the special F&V.	0.44		
I check the prices, even when I am buying inexpensive F&V.	0.49		
I often wait to purchase F&V, so I can get them on low price	0.74		







According to the results of the cluster analysis for Greek EOSC consumers in Table 45, the first cluster, with 91 consumers (41.9%) as the smallest cluster, was "value seeking" consumers.

Cluster 2 (N=109, 50.2%,) can be called "health conscious" consumers because they cared about the food safety in addition to the quality of F&V.

Cluster 3 (n=17, 7.8%) is called "conventional" or "traditional" consumers because they gave the lowest item scores compared to the other two clusters.

	onsamers				
Factors and items	Cluster 1	Cluster 2	Cluster 3	Kruskal-	Sig
	41.9%	50.2%	7.8%	Wallis H	
	(n=91)	(n=109)	(n=17)		
Factor 1: F&V consumption habits					
regularly purchasing F&V is necessary.	7 (60.4)	6 (40.4)	5 (41.2)	66.30	<0.001
regularly purchasing F&V is advantageous.	6 (45.1)	5 (33.9)	4 (64.7)	58.83	<0.001
regularly purchasing F&V is acceptable.	7 (49.5)	6 (48.6)	5 (47.1)	55.77	<0.001
regularly purchasing F&V is important.	7 (63.7)	6 (46.5)	5 (47.1)	67.23	<0.001
Factor 2: Purchasing motives					
Giving more vitamins and minerals.	7 (67.0)	6 (45.0)	5 (35.3)	32.50	<0.001
Helping to cut down calories.	7 (44.0)	6 (39.4)	4 (29.4)	30.78	<0.001
Helping to improve body's digestive system.	7 (60.4)	6 (48.6)	5 (35.3)	41.58	<0.001
Reducing the risk of getting cancer.	7 (44.0)	6 (31.2)	4 (47.1)	42.97	<0.001
Helping to look better in appearance.	7 (53.8)	6 (41.3)	5 (41.2)	58.07	<0.001
Factor 3: Quality and taste perception					
One of the criteria for choosing F&V is freshness.	7 (62.6)	6 (46.8)	4 (41.2)	56.54	<0.001
Seasonality of F&V is important to me.	7 (53.8)	6 (36.7)	5 (29.4)	29.08	<0.001
Nutritional contents of F&V are important to me.	7 (60.4)	6 (45.0)	5 (58.8)	49.94	<0.001
The taste and flavor of F&V influences my choice.	7 (67.0)	6 (47.7)	5 (35.3)	37.62	<0.001
The color and appearance of F&V influence my shopping choice.	7 (49.5)	6 (48.6)	4 (41.2)	32.96	
Factor 4: Health concern-confidence in fruit safety					
Paying attention to the food poisoning when buying F&V.	7 (44.0)	6 (36.7)	4 (35.3)	67.21	<0.001
Caring about residues of pesticides/other chemicals.	7 (62.6)	6 (43.1)	5 (35.3)	84.67	<0.001
Caring about chemicals released from F&V packaging.	7 (48.4)	6 (37.6)	4 (52.9)	84.81	<0.001
Paying attention to the additives.	7 (51.6)	5 (36.7)	4 (35.3)	75.47	<0.001
likely to purchase non-Genetic Modified F&V.	7 (41.8)	6 (31.2)	4 (47.1)	50.06	<0.001
Factor 5: important of F&V information					
Ingredients list (nutrition or vitamin facts).	6 (40.7)	4 (35.8)	4 (35.3)	67.64	<0.001
Geographical origin.	6 (34.1)	5 (38.5)	4 (58.8)	64.13	<0.001
Shelf life.	6 (40.7)	5 (33.0)	4 (58.8)	75.74	<0.001
Presence of the organic logo.	6 (36.3)	4 (30.3)	4 (35.3)	66.03	<0.001
Presence of environmental friendly production logos.	6 (36.3)	5 (32.1)	4 (41.2)	75.92	<0.001
Presence of ethical/social aspects logo.	7 (27.5)	4 (29.4)	3 (41.2)	67.07	<0.001
Factor 6: Price-consciousness scales		•	-		
When I buy F&V, I really look for specials.	6 (50.0)	5(38.5)	4 (47.1)	69.26	<0.001
I'm willing to pay even more for the special F&V.	6 (35.2)	5 (31.2)	3 (29.4)	42.24	<0.001
I check the prices, even when I am buying inexpensive F&V.	7 (41.8)	6 (40.4)	5 (47.1)	37.54	<0.001
I often wait to purchase F&V, so I can get them on low price	6 (27.5)	4 (23.9)	3 (64.7)	20.91	<0.001

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#### Table 45. Cluster analysis for Greek EOSC consumers



### 5. Conclusions

Task 1.3 assessed the attitudes, preferences, and purchasing behaviours of national and international consumers regarding certain F&V within specific supply chain systems. We intended to assess consumer preferences by focusing on their orientation toward sustainable and high-quality products and their willingness to pay for these attributes. We considered three trade circuits that are considered fundamental for Mediterranean countries, namely SFSCs, GPP, and EOSC.

Considering the described aim, the main results are as follows:

#### The main drivers that influence the preferences of F&V consumption:

#### **CROSS-CUTTING FEATURES AMONG ALL 3 SCSs:**

Benefits perceptions of F&V consumption:

- having vitamins and minerals,
- improvement of body's digestive system,
- led to better in appearance.

#### F&V choice criteria:

- freshness,
- seasonality,
- taste and flavor.

#### **Risks perceptions of F&V consumption:**

- pesticide/other chemical residues used during crop growth or processing,
- additives (like colorants, flavourings, and preservatives),
- genetically modified F&V products.

#### **SPECIFIC FEATURES:**

nothing relevant

Information consumers look for when purchasing F&V:

#### **CROSS-CUTTING FEATURES AMONG ALL 3 SCSs:**







The information consumers in different supply chains and countries looked for when purchasing F&V were varied, but in general, the most important information they needed was the following:

- organic certification,
- shelf-life information,
- geographic origin,
- nutritional content,
- environmentally friendly production.

#### **SPECIFIC FEATURES:**

• nothing relevant

Consumer satisfaction and trust in recent certifications:

#### **CROSS-CUTTING FEATURES AMONG ALL 3 SCSs:**

- the level of satisfaction and trust in the available certificates **varied** across the target countries.
- most SFSCs, GPP, and EOSC consumers were partially satisfied with the available certificates.

#### **SPECIFIC FEATURES:**

• satisfaction levels in **GPP were higher** than in the other two supply chains, and **EOSC** had **lower** satisfaction and trust levels than the other two supply chains.

# Information that is important for consumers in socioeconomic and environmental certification:

**CROSS-CUTTING FEATURES AMONG ALL 3 SCSs:** 

Socioeconomic certification:

- do not employ **child labour**,
- working conditions and wages,
- supporting local farmers,
- do not involve any **legal violations** in F&V production process.

#### **Environmental certification:**

- reducing use of **pesticides/fertilizers**,
- using water sparingly,
- low carbon emissions,
- deforestation nor loss of diversity.

#### **SPECIFIC FEATURES:**

nothing relevant

Consumer appreciation and willingness to pay for sustainability certifications: CROSS-CUTTING FEATURES AMONG ALL 3 SCSs:







- more consumers were willing to pay a higher price premium for F&V with an environmental certification compared to a socioeconomic certification.
- willingness to pay varied for different price premiums, but a price premium of up to 5% was most common in the target countries.
- the results of the comparison of WTP between F&V in the supply chain were different, although in most cases the **willingness to pay was higher for fruit** than for vegetables for both socioeconomic and environmental certifications.

#### **SPECIFIC FEATURES:**

• more consumers in the **EOSC were willing to pay up to 5%** for socioeconomic and environmental certifications than in the GPP and SFSC.

Clusters or segments of F&V consumers in the three supply chain systems: CROSS-CUTTING FEATURES AMONG ALL 3 SCSs:

Different clusters or segments of F&V consumers were categorized based on various factors. The summary of the results is as described in Figure 64 to Figure 66.

**SPECIFIC FEATURES:** 

- health-conscious consumers were the main consumers in SFSCs,
- value seeking consumers were the main consumers in GPP,
- quality-conscious consumers were the main consumers in EOSC.









#### Figure 64. Results of cluster analysis for SFSCs consumers



Figure 65. Results of cluster analysis for GPP consumers



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#### Figure 66. Results of cluster analysis for EOSC consumers







### PART 2 – TRAINING CONTENTS FROM WP1

#### 1. Introduction

This report contributes to the presentation of training content in modules for deliverables 1.1, 1.2, and 1.3. Training content has been designed based on the research questions, data elaboration and final recommendation included in the three deliverables in three levels of basic, intermediate, and advanced modules, grouped in 2 Training Packages (TP), as follows.

**TPO - INTRODUCTION TO FRUIT AND VEGETABLE SUPPLY CHAIN SYSTEMS** 

**Basic module:** 

→ TM 0.1: Fruit and vegetable supply chain systems definition and cluster of firms involved in the MED-LINKS project,

## TP1: CONSUMER ATTITUDES IN FRUIT AND VEGETABLE SUPPLY CHAINS

**Basic modules:** 

→ TM 1.1: Main drivers influencing consumer fruit and vegetables preferences,

→ TM 1.2: Information that consumers look for in existing certifications for Fruit and vegetables,

Intermediate module:

→ TM 1.3: Consumer trust in certificates for Fruit and vegetables, Advanced modules:

→ TM 1.4: Fruit and vegetables consumer appreciation and willingness to pay for Voluntary Sustainability Standards,

→ TM 1.5: Identification of fruit and vegetables consumer segments for marketing activity.

Each module is articulated in following sections:

- 1. An introduction and the learning goals of the module;
- 2. learning units dealing with the specific topics of interest;
- 3. A self-assessment test;
- 4. A **glossary** of the most relevant abbreviations or definitions.

The contents of each module are described in detail in next sections of this report, and they have been designed to deployed in different ways. A first possible implementation would be as elearning courses of around half an hour each. In fact, the modules are suitable to be distributed on any web-based electronic educational platform that, when implementing international standards and certifications will allow for their widest dissemination among stakeholders.





<u>Specifically, the training modules will be published on the **MED-LINKS online platform** available at: <u>https://www.med-links-platform.eu</u></u>

As a second option, the training modules provide a valuable knowledge base to be shared with stakeholders also as printed documents during both online and live events (webinars, fairs, master courses, ...).

# 2. Training Package 0 – Introduction to fruit and vegetable supply chain systems

Training Module 0.1: Fruit and vegetable supply chain systems definition and cluster of firms involved in the MED-LINKS project,

Throughout this module, we aim to delve into fundamental concepts by providing clear definitions of key terms associated with the fruit and vegetables supply chain, as well as clarifying the intricacies of the three primary chains within the fruit and vegetables sector. Moreover, we will address the unique characteristics and production clusters prevalent in Mediterranean countries such as Egypt, France, Greece, Italy, and Morocco (ANNEXE 1).

The module consists of two units:

• Unit 1: Fruit and Vegetable Supply Chain Systems Definition

This unit provides clear definitions of essential terms within the fruit and vegetable supply chain, establishing a solid understanding of the sector's structure, processes, and stakeholders.

• Unit 2: Clusters of Firms Involved in the MED-LINKS Project

This unit presents an overview of the clusters of firms involved in the MED-LINKS project, specifically focusing on five Mediterranean countries: Egypt, France, Greece, Italy, and Morocco. It highlights the unique characteristics of production clusters in these regions, demonstrating their vital role in the global fruit and vegetable supply chain.

The module concludes with a self-assessment test to ensure understanding of the key concepts, followed by a glossary of terms for further clarification.







# 3. Training Package 1: Consumer attitude in fruit and vegetable supply chain systems

#### Training Module 1.1: Main drivers influencing consumer fruit and vegetables preferences,

In this module, we will focus on the main factors that influence consumer preferences in relation to F&V. We focus on the three main F&V supply chains: Short Food Supply Chains (SFSCs), Green Public Procurement (GPP) and Export Oriented Supply Chain (EOSC) (ANNEXE 2).

Participants will gain insights into the motivations and barriers that influence consumer choices within each supply chain includes:

#### Perceived benefits:

- nutritional value of F&V,
- essential vitamins and minerals,
- digestive system and improvement in personal appearance.
- Criteria for choosing F&V:
  - Freshness, seasonality, taste,
  - high-quality, flavorful, seasonal products, and origin of them.
- Risk perceptions related to F&V:
  - pesticide and chemical residues,
  - the presence of additives and fears about genetically modified products.

The module includes a self-assessment test to ensure participants can evaluate their understanding of the material provided. Additionally, a glossary is provided to clarify technical terms and enhance comprehension.






# Training Module 1.2: Standards that consumers look for in existing certifications for Fruit and vegetables

This training module aims to provide participants with a comprehensive understanding of the different information needs of consumers in different supply chains and countries when buying F&V. The focus is on the key factors that influence consumer choices (ANNEXE 3).

The Module highlights the following critical types of information that F&V consumers value most:

- 1. Organic Certification Assurance of environmentally friendly and chemical-free production.
- 2. Shelf-Life Information Transparency about product freshness and usability.
- 3. Geographic Origin Knowledge of where the product was grown, supporting traceability and trust.
- 4. Nutritional Content Clear details about health-related benefits and ingredients.
- 5. Environmentally Friendly Production Practices that minimize environmental impact and promote sustainability.

The module concludes with self-assessment tests to ensure understanding and application of the concepts presented. A glossary is also included to clarify technical terms and enhance comprehension.







#### Training Module 1.3: Consumer trust in certificates for Fruit and vegetables

The main goal of this module is to address the diverse levels of satisfaction and trust in available certifications across different countries, focusing on SFSCs, GPP, and EOSC (ANNEXE 4).

This module examines the critical role of trust in certificates within the fruits and vegetables sector. Participants are introduced to the levels of consumer satisfaction and trust associated with various certification schemes, with a particular focus on the dynamics within Short Food Supply Chains (SFSCs), Green Public Procurement (GPP), and Export-Oriented Supply Chains (EOSC).

The module concludes with a self-assessment test designed to reinforce the key concepts and ensure participants can apply their learning effectively. Additionally, a glossary is provided to clarify technical terms and enhance understanding.







Training Module 1.4: Fruit and vegetables consumer appreciation and willingness to pay for Voluntary Sustainability Standards

This training module aims to explore the key criteria or information certifications that play a pivotal role in shaping a responsible and conscious F&V consumer landscape. In addition, consumer appreciation and willingness to pay for sustainability certifications will be examined (ANNEXE 5).

The module consists of three units:

- Unit 1: Information Important for Socioeconomic Standards; This Unit explores the socioeconomic criteria in certifications that drive consumer trust and responsibility.
- Unit 2: Information Important for Environmental Standards; This Unit Identifies environmental factors in certifications that are most valued by consumers.
- Unit 3: Consumer Appreciation and Willingness to Pay for VSS; This Unit assesses consumer recognition of VSS and their willingness to pay a premium for sustainability.

The module concludes with a self-assessment test designed to reinforce the key concepts and ensure participants can apply their learning effectively. Additionally, a glossary is provided to clarify technical terms and enhance understanding.





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Training Module 1.5: Identification of fruit and vegetables consumer segments for marketing activity

This module aims to provide an insight into the distinct clusters or segments of F&V consumers within three prominent supply chain systems—SFSCs, GPP, and EOSC. Through the analysis, we will identify cross-cutting features prevalent across all three SCSs, elucidating the diverse categorization of F&V consumers based on various factors (ANNEXE 6).

Key components of the module include:

- Segmentation in SFSCs,
- Segmentation in GPP,
- Segmentation in EOSCs.

The module concludes with a Self-Assessment Test to ensure comprehension and reinforce learning objectives, as well as a Glossary to clarify key terms and concepts related to F&V consumer segmentation and supply chain systems.







### Contribution to Sustainable Development Goals (SDGs)

This deliverable makes meaningful contributions to several Sustainable Development Goals (SDGs). It highlights how the analysis of consumer preferences and the dissemination of knowledge contribute to the Mediterranean F&V supply chains.

#### SDG 1: End poverty in all its forms everywhere

Deliverables 1.3 collectively address SDG 1 by empowering small-scale farmers and agricultural workers. The analysis of consumer preferences for sustainability certifications and ethical labour practices identifies pathways to improve market access and secure livelihoods. Structured training modules disseminate knowledge on market needs, certifications, and sustainable practices, helping producers integrate into competitive markets and fostering income growth and resilience in rural communities.

## SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

Deliverables 1.3 directly contributes to SDG 2 by promoting sustainable agricultural practices, such as low pesticide use, water-efficient production, and seasonal produce. By evaluating consumer demand for environmentally friendly and high-quality F&V products, and through training modules emphasizing responsible farming practices and certifications, the deliverables support improved food security, nutrition, and sustainable agriculture in the Mediterranean region.

### SDG 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all

Deliverables 1.3 contributes to SDG 8 by aligning socioeconomic certifications (e.g., fair wages and ethical labor practices) with consumer expectations. These insights promote fair labor conditions and sustainable employment opportunities. Training modules equip stakeholders with tools to optimize business models and strengthen F&V value chains, fostering job creation, productivity, and economic growth in the Mediterranean agricultural sector.

#### SDG 12: Ensure sustainable consumption and production patterns

The Deliverable 1.3 promote SDG 12 by examining consumer preferences for environmentally friendly and socially responsible F&V certifications. Findings encourage producers and supply chain actors to align with sustainable consumption patterns, such as choosing local and seasonal products and minimizing chemical usage. Training modules enhance awareness of sustainability standards and the importance of environmentally friendly practices, fostering sustainable production processes and informed consumption patterns.

#### SDG 13: Take urgent action to combat climate change and its impacts

Deliverable 1.3 highlights consumer interest in certifications addressing environmental factors such as carbon emissions and pesticide reduction. The deliverables support SDG 13 by identifying consumer demand for low-carbon, sustainable agricultural products and providing training on climate-smart agricultural practices. Modules emphasize reducing pesticide use, managing water resources efficiently, and minimizing carbon emissions, facilitating the transition to environmentally sustainable farming systems.





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## SDG 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

Deliverable 1.3 contributes to SDG 17 by fostering collaboration among producers, consumers, policymakers, and researchers. Insights from Deliverable 1.3 on consumer willingness to pay for certifications serve as a foundation for partnerships promoting sustainable supply chains. The training contents strengthen these partnerships through training modules that facilitate knowledge exchange and collective action, enhancing regional and global collaboration on sustainability and economic development.





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### ANNEXES - TRAINING MODULE SLIDES

### ANNEX 1. Training Module 0.1: Fruit and vegetable supply chain systems definition and cluster of firms involved in the MED-LINKS project.



The PRIMA programme is an Art. 185 initiative supported and founded under Horizon 2020, the European Union's Framework Programme for Research and Innovation



























































The PBMA programme is an Art 115 initiative supported and fundational the spectra and fundation of the programme for Research and Incords the programme for Research and Incords the spectra and Incor	FV supply chain systems MODULE 0.1: F&V supply chain systems definition and clu Self-assessment test	MED-LINKS
Self-assessment test		
3. In which geographical area do E	port Oriented Supply Chains (EOSCs) primarily operation	ate?
a) Local b) National c) Regional d) International		
4. What is the primary activity of t	he cluster/s of firms in Egypt's citrus production?	$\sim$
a) Lemon production b) Orange production c) Grapefruit production d) Apple production		



The MRMA programme is an Art. LISinitiative supported and foundation Union's Framework Programme for Research and Innovation	FV supply chain systems MODULE 0.1: F&V supply chain systems definition and cl Self-assessment test	MED-LINKS 🔅			
Self-assessment test					
7. What is the typical size range of farms within the Italy Fruit & Vegetable SFSCs cluster?					
a) Small-size					
b) Medium-size					
c) Large-size					
d) Variable, ranging from small to la	rger size				
8. What is the primary product prod a) Oranges b) Bananas c) Apples d) Grapes	duced by the Morocco SFSCs?	D SET RESERVENT			

The FRIAD programme is an Art. 135 initiative supported and foundation of the transmission of the transmis	FV supply chain systems MODULE 0.1: F&V supply chain systems definition and cluster identification Self-assessment test answers	MED-LINKS
Self-assessment test answers	5	
1. b) Local producers		
2. c) Both "a" and "b"		
3. d) International		
4. b) Orange production		
5. c) Collective restaurants		
6. b) Product quality		
7. d) Variable, ranging from small t	o larger size	
8. c) Apples		





# ANNEX 2. Training Module 1.1: Main drivers influencing consumer fruit and vegetables preferences.



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The MIAA programme is an Art. LIS initiative separate and control and Union's Framework Programme for Research and Innovation	Consumer attitude in FV supply chain systems MODULE 1.1: Main drivers influencing consumer preferences for F&V Learning goals	MED-LINKS
Learning goals		I
Goal 1 Identify and comprehend the various h	ealth benefits associated with the consumption of F&V.	
Goal 2 Explore and understand the factors that	t influence consumers' choices when selecting F&V.	
Goal 3 Examine and comprehend perceived ris	sks associated with the consumption of F&V.	






















ANNEX 3. Training Module 1.2: Standards that consumers look for in existing certifications for Fruit and vegetables.



The PRIMA programme is an Art. 185 initiative supported and founded under Horizon 2020, the European Union's Framework Programme for Research and Innovation



The FRIAD programme is an Art. 155 initiative important and foundation of the formation of	Consumer attitude in FV supply chain systems MODULE 1.2: Standards that consumers look for in existing certifications for F&V
MODULE 1.2: Standa	rds that consumers look for in existing
certifications for F&\	/







The FRIMA programme is an Art 1. The FRIMA programme is an Art 1. State Reconstruction and Union's Framework Programme for Research and Innovation	Consumer attitude in FV supply chain systems MODULE 1.2: Standards that consumers look for in existing certifications for F&V
<ul> <li>When consumers are sho consider various factors to healthy choices.</li> <li>&gt; Quality and Freshness,</li> <li>&gt; Seasonality,</li> <li>&gt; Origin and Source,</li> <li>&gt; Organic vs. Convention</li> <li>&gt; Price,</li> <li>&gt; Nutritional Informatio</li> <li>&gt; Certifications and Labe</li> <li>&gt; Local and Farmer's Material</li> </ul>	<pre>pping for fruits and vegetables, they typically o ensure they are making informed and  n, els, rket.</pre>























ANNEX 4. Training Module 1.3: Consumer trust in certificates for Fruit and vegetables.











The FIEldA programme is an Art. ISS instantion upported and foundari the result of the transport that is a function of the transport that	Consumer attitude in FV supply chain systems MODULE 1.3: Consumer trust in certificates for F&V Introduction	MED-LINKS
<ul> <li>Introduction</li> <li>Satisfaction and trust in availa factors for both consumers and</li> <li>Satisfaction and trust in availabased on a combination of factor</li> </ul>	ble food certifications are crucial companies in the food industry. able food certifications can vary ors.	APPROVED

The FRIMA programme is an Art. 155 initiative supported and founded the relation 2010, the fundamentation of the format of the f	Consumer attitude in FV supply chain systems MODULE 1.3: Consumer trust in certificates for F&V	MED-LINKS
	Learning goals	
• Learning goals		
Addressing the levels of satisfactic across different countries,	in and trust in available certifications	
focusing on:	POOR	COOR
SFSCs,		6000
GPP,	VERY BAD	EXCELLENT
and EOSC.		
		<u>.</u>













Section 2012 A section of the sectio	Consumer attitude in FV supply chain systems MODULE 1.3: Consumer trust in certificates for F&V	MED-LINKS
		—
Conclusions		
CROSS-CUTTING FEATURES AM	ONG ALL 3 SCSs:	
<ul> <li>the level of satisfaction and the target countries.</li> </ul>	trust in the available certificates varied across	
<ul> <li>most SFSCs, GPP, and EOSC c available certificates.</li> </ul>	onsumers were partially satisfied with the	
SPECIFIC FEATURES:		
satisfaction levels in GPP were h EOSC had lower satisfaction and	igher than in the other two supply chains, and I trust levels than the other two supply chains.	



The FBIAA programme is an Art. 151 indicative imported and founded while reporting to the function of the function Union's Framework Programme for Research and Innovation	Consumer attitude in FV supply chain systems MODULE 1.3: Consumer trust in certificates for F&V	MED-LINKS
	self-assessment	
Self-assessment test		
1. Which of the following supply available certificates?	r chains had the highest satisfaction levels in the	
a. SFSCs		
b. GPP		
c. EOSC		
d. GPP and EOSC equally		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
e. None of the above		D SET RESERVENT

The FRIAD programme is an Art: 155 instante imported and founded with registromatications and the instante of the foreign and the registromatication of the foreign and the registromatication of the foreign and the registromatication of the foreign and the description of the registromatication of the registromatication description and the registromatication of the registromatication of the description of the registromatication of the registromatication of the registromatication of the description of the registromatication of the registromatication of the registromatication of the description of the registromatication of the registromat	Consumer attitude in FV supply chain systems MODULE 1.3: Consumer trust in certificates for F&V	MED-LINKS
	Self-assessment	
Self-assessment test		
2. In which aspect did the le certificates vary across the targe	evel of satisfaction and trust in the available et countries?	
a. SFSCs		
b. GPP		
c. EOSC		
d. All of the above		~ 0
e. None of the above		



The FRIENd Aregramme is an Arc 13b initiative supported market framework in a framework in a second	Consumer attitude in FV supply chain systems MODULE 1.3: Consumer trust in certificates for F&V	MED-LINKS
Module 1.3		
Glossary		

The FRINKA programme is an Art. 133 instants upported and founded definition of the instant of the instant of the instant definition of the instant of the instant of the instant definition of the instant of the instant of the instant of the instant definition of the instant of the instant of the instant of the instant of the instant definition of the instant of	Consumer attitude in FV supply chain systems MODULE 1.3: Consumer trust in certificates for F&V <i>Glossary</i>	MED-LINKS
Glossary     Fruit and Vegetables (F& Supply Chain System (SC Short Food Supply Chain: Green Public Procuremen Export Oriented Supply C	V) 5) s (SFSCs) ht (GPP) Lhain (EOSC)	

ANNEX 5. Training Module 1.4: Fruit and vegetables consumer appreciation and willingness to pay for Voluntary Sustainability Standards.



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The PRIMA programme is as Add. L15 initiative appointed and studied to financial Add and the programme is as Add. L15 initiative appointed and studied to financial Add and the programme is as Add L15 initiative appointed and the programme is as	Consumer attitude in FV supply chain s MODULE 1.4: F&V Consumer appreciation Sustainability Standards U1. Information that is important for	ystems MED-LINKS
Voluntary socioeconomic stand	dards:	
These standards refer to guideline to improve the social and econom	es and practices that aim nic conditions.	B ROLESTAND S FAIR A
Some common aspects often inclu	ude:	Naturdand
<ul> <li>Fair Trade Certification,</li> <li>Worker Welfare,</li> <li>Working conditions and wages</li> <li>Gender Equality.</li> </ul>	;,	FAIRTRADE



















The PRIMA programme is an Art. 185 initiative supported and founded under Horizon 200, the European Under: Framework Programme for Benerich and International Control of Control Benerich and International Control of Control of Control Benerich and International Control of Con	Consumer attitude in FV supply chain systems MODULE 1 (1) F8V Consumer appropriation and willingness to pay for Voluntary Systemiability Standard		
	U2. Information that is important for consumers in voluntary environmental standards		
Let's recap some definitions!			
<ul> <li>Short Food supply chain</li> <li>Green public procurement</li> <li>Export oriented supply cha</li> </ul>	in		











PRIMA The PRIMA programme is supported and founded and founded with force 2020, the first programme is the programme in the programme is the p	A Art HIS INSTANCE Transpoor	MED-LINKS		
Union's Framework Programme for Research and Innovation	Annual Annua	ry Sustainability Standards		
	U3. Consumer appreciation and willingness to pay for VSS			
Consumer willingness	Consumer willingness to pay for voluntary sustainability standards:			
Consumer behaviour is	complex, and individual preferences may vary.			
Awareness and Und	erstanding.			
<ul> <li>Trust in Certification</li> </ul>	),			
<ul> <li>Perceived Benefits,</li> </ul>				
Demographic Factor	ſS,			
<ul> <li>Availability and Acce</li> </ul>	essibility.			
,				







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P	PRIMA	The PRIMA programme is an Art. 185 initiative supported and founded under Nationa 2020, the Eveneer	Consumer attitude in FV supply chain systems
£	IN THE MEDITERDANEAN AND	Union's Framework Programme for Research and Innovation	MODULE 1.4: F&V Consumer appreciation and willingness to pay for Voluntary Sustainability Standards
			Conclusion
•	Conclusions		
CR	OSS-CUTTING FEATUR	RES AMONG ALL 3 SC	Ss:
•	more consumers we	ere willing to pay a hig	ther price premium for F&V with an <b>environmental VSS</b> compared to a socioeconomic VSS.
•	willingness to pay va	aried for different prio	e premiums, but a price premium of <b>up to 5%</b> was most common in the target countries.
•	<ul> <li>results of the comparison of WTP between F&amp;V in the supply chain were different, although in most cases the willingness to pay was higher for fruit than for vegetables for both socioeconomic and environmental VSS.</li> </ul>		
SPI	ECIFIC FEATURES:		
•	more consumers in t	he <b>EOSC were willing</b>	to pay up to 5% for socioeconomic and environmental VSS than in the GPP and SFSC.











	The PRIMA programme is an Art. 155 initiative supported and founded the provide provide programme for the provide provide the programme for Research and Innovation	Consumer attitude in FV supply chain systems MODULE 1.3 : F&V Consumer appreciation and willingness to pay for Voluntary Sus <i>Glossary</i>	MED-LINKS
<ul> <li>Gloss</li> <li>Willin produ</li> <li>Volun and ed</li> </ul>	sary agness to Pay (W ict with specific a itary Sustainabili conomic aspects	TP): The maximum amount a consumer is willing to spend on a attributes, such as sustainability certifications. <b>ty Standards</b> (VSS): Standards that address environmental, social, of sustainability in supply chains.	

ANNEX 6. Training Module 1.5: Identification of fruit and vegetables consumer segments for marketing activity.



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The FRIAM programme is an Art. 155 Initiative important and found	Consumer attitude in FV supply chain syst MODULE 1.5: Identification of F&V consume Introduction	ems r segments for marketing activity	MED-LINKS
Introduction     Consumer segments refer to groups of characteristics, behaviors, preferences, or     Fruit and vegetable consumer segment consumers based on their preferences, fruits and vegetables.	of consumers who share similar r needs. It refers to the categorization of behaviors, and attitudes towards		
Different factors can be considered in set Demographics Lifestyle Health and Wellness Cultural and Ethnic Factors Geographic Location	gmenting this market:	Types Market Segn Ceographic Demographic	of nentation







The FRIMA programme is an Art. 115 initiative supported and founded under Hotman 2000, the European University of European European University of European	Consumer attitude in FV supply chain systems MODULE 1.5: Identification of F&V consume	MED-LINKS
Market segments based vegetables related lifest	l on consumers' fruit and cyles were obtained.	👳 🕵 🗃 🤋 o 🚨 🖉
<ul> <li>Based on this, several fa</li> <li>Consumption habits of</li> <li>Purchase motives</li> <li>Quality and taste pero</li> <li>Health concerns - con</li> <li>Important information</li> <li>Price issues</li> </ul>	actors were considered: of F&V ceptions fidence in the safety of F&V n about F&V	Total Market Total Market Market Segment

Consumer attitude in FV supply of Montherman Strategy and	chain systems MED-LINKS
-SCs	
Italy	quality-
"quality-conscious" consumers= 39.2%	conventional or traditional, 27.30%
"value seeking" consumers= 33.4%	SFSCs
"conventional" consumers= 27.3%	
	value seeking, 33.40%













The FRIMA programme is an Art. 115 initiative supported and founded under Hotman 2000, the European University of European European University of European	Consumer attitude in FV supply chain systems MODULE 1.5: Identification of F&V consume	MED-LINKS
Market segments based vegetables related lifest	l on consumers' fruit and cyles were obtained.	👳 🕵 🗃 🤋 o 🚨 🖉
<ul> <li>Based on this, several fa</li> <li>Consumption habits of</li> <li>Purchase motives</li> <li>Quality and taste pero</li> <li>Health concerns - con</li> <li>Important information</li> <li>Price issues</li> </ul>	actors were considered: of F&V ceptions fidence in the safety of F&V n about F&V	Total Market Total Market Market Segment

Consumer attitude in FV supply classes with the service and the service with the service wi	aain systems &V consumer segments for marketing activity
рр	
Italy	conventional or traditional, 7.90%
"value seeking" consumers= 49.1%	value seeking, 49.10%
"quality-conscious" consumers= 43%	
"conventional" consumers= 7.9%	quality conscious, 43%





Research and Incovation	Consumer attitude in FV supply c MODULE 1.5: Identification of F&	hain systems .V consumer segments for marketing activity	MED-LINKS
Export Oriented Supply Chain (E	<u>:OSC)</u>		
It is specifically tailored requirements and standards of f and regulatory bodies, ensuring safety of the produce.	to meet the foreign customers g the quality and	EXPO	





















under Horizon 2020 the Europes	2019 Consumer attitude in FV supply chain systems
Union's Framework Programme Research and Innovation	MODULE 1.5 : Identification of F&V consumer segments for marketing activity
	Glossary
Glossary	
Consumer Segments: 0	Groups of consumers with similar behaviors, preferences, or needs.
Short Food Supply Cha	ins (SESCs): Systems designed to minimize the distance and steps
between production ar	id consumption.
between production ar • Green Public Procurem	ind consumption. ient (GPP): A framework for reducing environmental and social
<ul> <li>between production ar</li> <li>Green Public Procurem impacts through sustain</li> <li>Export-Oriented Supplicement</li> </ul>	in consumption. ient (GPP): A framework for reducing environmental and social hable procurement.
<ul> <li>between production ar</li> <li>Green Public Procurem impacts through sustai</li> <li>Export-Oriented Suppl guality and safety stand</li> </ul>	and consumption. <b>nent</b> (GPP): A framework for reducing environmental and social hable procurement. <b>y Chain</b> (EOSC): Supply chains focused on meeting international lards for export.
<ul> <li>between production ar</li> <li>Green Public Procurem impacts through sustaii</li> <li>Export-Oriented Suppl quality and safety stand</li> <li>Market Segmentation:</li> </ul>	and consumption. <b>nent</b> (GPP): A framework for reducing environmental and social nable procurement. <b>y Chain</b> (EOSC): Supply chains focused on meeting international dards for export. The process of dividing a market into distinct groups based on shared
<ul> <li>between production ar</li> <li>Green Public Procurem impacts through sustain</li> <li>Export-Oriented Supple quality and safety stand</li> <li>Market Segmentation: characteristics, such as</li> </ul>	and consumption. <b>nent</b> (GPP): A framework for reducing environmental and social nable procurement. <b>y Chain</b> (EOSC): Supply chains focused on meeting international dards for export. The process of dividing a market into distinct groups based on shared demographics, lifestyle, and purchase motives.
<ul> <li>between production ar</li> <li>Green Public Procurem impacts through sustain</li> <li>Export-Oriented Suppl quality and safety stand</li> <li>Market Segmentation: characteristics, such as</li> </ul>	and consumption. nent (GPP): A framework for reducing environmental and social nable procurement. y Chain (EOSC): Supply chains focused on meeting international Jards for export. The process of dividing a market into distinct groups based on shared demographics, lifestyle, and purchase motives.
<ul> <li>between production ar</li> <li>Green Public Procurem impacts through sustaii</li> <li>Export-Oriented Suppl quality and safety stand</li> <li>Market Segmentation: characteristics, such as</li> </ul>	and consumption. nent (GPP): A framework for reducing environmental and social nable procurement. y Chain (EOSC): Supply chains focused on meeting international dards for export. The process of dividing a market into distinct groups based on shared demographics, lifestyle, and purchase motives.

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