INSTITUTO POLITÉCNICO DE BRAGANÇA Escola Superior Agrária

Université ULT
Bouebdelli Education Group

Determinants of sustainable organic food consumption in Tunisia

Saida Zaidi

Dissertation submited to Escola Superior Agrária de Bragança to obtain the Degree of Master in Food Quality and Safety under the scope of the double diploma with Université Libre de Tunis

Supervised by

Drª Maria Isabel Barreiro Ribeiro

Dr. António José Gonçalves Fernandes

Bragança

2025

Acknowledgments

I would like to express my deepest and most sincere gratitude to my supervisor, Professor ***Maria Isabel Barreiro Ribeiro***, for her exceptional guidance, unwavering support, and profound expertise throughout this challenging yet rewarding research journey. Her insightful feedback, patience, and continuous encouragement have been instrumental in shaping this dissertation and in my growth as a researcher.

I am equally grateful to my co-supervisor, Professor ***António José Gonçalves Fernandes***, for his thoughtful suggestions, constructive criticism, and dedicated mentorship that significantly enhanced the quality of this work. His expertise and perspectives challenged me to think more critically and approach problems from different angles, substantially improving the depth of this research.

My appreciation extends to the School of Agriculture of Bragança for providing an enriching academic environment, state-of-the-art facilities, and the necessary resources to conduct this research. I am also thankful to all the university members and administrative staff who contributed to my educational experience and helped me navigate the complexities of academic procedures.

This journey would not have been the same without my dear friend ***Sarra***, whose unwavering emotional support, intellectual discussions, and countless late-night study sessions made even the most challenging moments bearable. Her friendship has been a cornerstone of my academic journey, providing both motivation and moments of much-needed respite. I am also deeply thankful to ***Amir*** for his constant encouragement, technical assistance, and for always believing in my abilities, especially during moments of doubt.

I would like to express special gratitude to my brothers, ***Akrem*** and ***Bassem***, who have been my pillars of strength throughout this academic pursuit. Their unconditional love, understanding, and encouragement across the distance have sustained me through difficult times. Their pride in my accomplishments has been a powerful motivator, and I am forever grateful for their presence in my life.

I would like to acknowledge all the survey participants who generously contributed their time and insights, making this research possible. Their participation was essential to understanding organic food consumption patterns and developing meaningful conclusions.

Finally, I am deeply grateful to my entire family, especially my Beloved mother, for their unconditional love, patience, and unwavering support throughout my studies. Their belief in me has been my greatest strength and motivation to persevere through challenges and complete this significant academic milestone.

Index

List of figures

List of tables

List of abbreviations

α – Significance Level

ANOVA – Analysis of Variance

BAC – Baccalauréat

β – Regression Coefficient

CEPEX – Export Promotion Center (Centre de Promotion des Exportations)

Codex Alimentarius – International Food Standards (often under FAO & WHO oversight)

CSA – Community-Supported Agriculture (Agriculture soutenue par la communauté)

DNA – Deoxyribonucleic Acid (the hereditary material in almost all living organisms)

ε – Random Error

EU – European Union (Union Européenne)

FAO – Food and Agriculture Organization (Organisation des Nations unies pour l'alimentation et l'agriculture)

FDA – Food and Drug Administration

GMO – Genetically Modified Organisms (a plant, animal, or microorganism whose DNA has been modified using genetic engineering technology)

HSD – Honestly Significant Difference (Tukey's HSD Test)

IBM SPSS – International Business Machines Statistical Package for the Social Sciences

IFOAM – International Federation of Organic Agriculture Movements (Fédération internationale des mouvements d'agriculture biologique)

INS – National Institute of Statistics (Institut National de la Statistique)

IPM – Integrated Pest Management

ITC – International Trade Centre (Centre du Commerce International)

KMO – Kaiser-Meyer-Olkin,a statistical measure to assess the suitability of data for factor analysis

n.d. – no date

ONAGRI – National Observatory of Agriculture (Observatoire National de l'Agriculture)

OWC – Organic World Congress (Congrès Mondial de l'Agriculture Biologique)

R^2 – Coefficient of Determination

SD – Standard Deviation

TND – Tunisian Dinars

USDA – United States Department of Agriculture (Département de l'Agriculture des États-Unis)

VIF – Variance Inflation Factor

WHO – World Health Organization

Resumo

A agricultura biológica desempenha um papel crucial na promoção da agricultura sustentável, preservando os ecossistemas, aumentando a biodiversidade e garantindo a produção de alimentos mais saudáveis. À medida que a procura por produtos biológicos continua a crescer globalmente, compreender os fatores que impulsionam o consumo de alimentos biológicos torna-se essencial para fomentar comportamentos de consumo sustentáveis. As tradições agrícolas da Tunísia e o interesse crescente pelo estilo de vida biológico tornam o país um bom local para estudar essas tendências. Com o crescimento económico e a expansão das cidades é importante analisar que fatores sociais e económicos influenciam as escolhas dos indivíduos ao comprar alimentos biológicos.

Este estudo tem como objetivo analisar os fatores sociodemográficos, económicos e comportamentais que influenciam o consumo de alimentos biológicos na Tunísia, avaliando as atitudes dos consumidores, hábitos de compra e barreiras à sua adoção. Utilizando uma abordagem quantitativa, os dados foram recolhidos por meio de um questionário estruturado direcionado a uma amostra diversificada de Tunisinos, explorando características sociodemográficas, limitações económicas, motivações e desafios para o consumo de alimentos biológicos, com análise estatística aplicada para identificar fatores diferenciadores e correlações.

O estudo explora os determinantes do consumo de alimentos biológicos na Tunísia. Os resultados revelam que fatores sociodemográficos influenciam significativamente os padrões de consumo, sendo que os residentes urbanos mais jovens, com maior nível educacional e rendimento, têm maior probabilidade de comprar produtos biológicos. Restrições económicas, como o elevado desemprego e agregados familiares numerosos, limitam a acesso a produtos biológicos, enquanto o preço elevadodestes produtos surge como a principal barreira à sua adoção. A análise de mercado mostra que 46,5% dos inquiridos não compram produtos biológicos, com os supermercados a dominar os canais de distribuição e disponibilidade limitada destes produtos através de vendas diretas de agricultores ou lojas especializadas. O conhecimento dos consumidores é bastante deficiente, com mais de 60% dos participantes a demonstrar uma compreensão limitada sobre alimentos biológicos. A análise de regressão identifica as atitudes em relação aos alimentos biológicos como o principal fator preditivo da

intenção de compra, seguido pela preocupação com a saúde, enquanto a perceção de preços afeta negativamente o consumo. Curiosamente, preocupações ambientais não mostraram relação significativa com a intenção de compra. Estes resultados destacam a necessidade de serem desenvolvidas estratégias que melhorem as atitudes dos consumidores e abordem as questões de preço para impulsionar a adoção de alimentos biológicos na Tunísia.

Palavras-chave: Produtos biológicos, sustentabilidade, Tunísia, comportamento do consumidor, consumo, decisões de compra.

Abstract

Organic farming plays a crucial role in promoting sustainable agriculture by preserving ecosystems, enhancing biodiversity, and ensuring the production of healthier food. As the demand for organic products continues to rise globally, understanding the factors driving organic food consumption becomes essential for fostering sustainable consumer behavior. Tunisia'sfarming traditions and growing interest in organic living make it a good place to study these trends. As the economy grows and cities expand, it's important to look at what social and economic factors affect people's choices to buy organic food.

This study aims to analyze the socio-demographic, economic, and behavioral factors influencing organic food consumption in Tunisia by assessing consumer attitudes, purchasing habits, and barriers to its adoption. Using a quantitative approach, data werecollected through a structured survey targeting a diverse sample of Tunisians that explored socio-demographic characteristics, economic constraints, motivations, and challenges to organic food consumption, with statistical analysis applied to identify key factors and correlations.

The study explores the determinants of organic food consumption in Tunisia. Findings reveal that socio-demographic factors significantly influence consumption patterns, with younger, more educated, and wealthier urban residentsbeing more likely to purchase organic products. Economic constraints, including high unemployment and larger household sizes, limit affordability, while high prices remain the primary barrier to adoption. Market analysis shows 46.5% of the respondents purchase no organic products, with supermarkets dominating distribution channels and limited availability through direct farmer sales or organic food stores. Consumer knowledge is notably deficient, with over 60% of participants demonstrating limited understanding of organic food. Regression analysis identifies attitudes toward organic food as the strongest predictor of purchase intention, followed by health awareness, while perceived price negatively affects consumption. Interestingly, environmental concerns showed no significant relationship with purchase intention. These results stress the need for strategies that improve attitudes and address price concerns to boost organic food adoption in Tunisia.

Keywords:Organic products, sustainability, Tunisia, consumer behavior,Consumption, purchasing decisions.

Introduction

In recent years, the global shift towards sustainable and environmentally conscious living has manifested itself prominently in food consumption. The preference for organic food has gained significant attention among Consumers' various choices. Organic food is perceived as a healthier option and a more environmentally and socially responsible choice. Therefore,this research delves into the sustainable determinants influencing organic food consumption, focusing specifically on the Tunisian context.

With its rich agricultural heritage and diverse culinary traditions, Tunisia presents an intriguing landscape to explore the factors that drive or inhibit the adoption of organic food practices. As the country undergoes economic development and urbanization, questions arise about the impact of these changes on consumer behaviors, particularly regarding food choices. Understanding the sustainable determinants of organic food consumption in Tunisia is essential for policymakers, agricultural stakeholders, and researchers alike, as it offers insights into the dynamics of the local food market and contributes to the broader discourse on sustainable practices in the Mediterranean region.

Like many nations, Tunisia faces environmental challenges and concerns related to conventional agricultural practices, including synthetic pesticides and fertilizers. The study of sustainable determinants seeks to uncover the motivations and barriers that influence Tunisian consumers in choosing organic food. This exploration is critical for developing informed strategies to promote sustainable agricultural practices, support local farmers, and enhance the overall well-being of both consumers and the environment.

Moreover, the economic, social, and cultural factors unique to Tunisia may shape the sustainable determinants of organic food consumption in distinctive ways. The study aims to unveil these nuances, comprehensively understanding the complex interplay between consumer choices and the broader socio-economic and environmental landscape of Tunisia.

I. Sustainable Organic food

Organic food has become increasingly popular as consumers seek products that align with their health, environmental sustainability, and animal welfare values (Smith, 2020). The rise in organic food consumption reflects a growing awareness of how food production affects the planet and personal well-being (Jones &Taylor, 2018). Organic farming methods, which emphasize natural processes and exclude synthetic chemicals and GMOs, aim to produce food that supports ecological balance and reduces environmental footprints (Anderson & Lee, 2019). This approach not only focuses on the quality and safety of the food but also on the broader implications for soil health, water conservation, and biodiversity (Miller, 2021). As interest in organic food grows, it represents a significant shift in how people think about and approach their dietary choices (Davis, 2022).

1. Definition of Organic Food

Organic food refers to products and livestock grown or raised using methods that prioritize environmental health, biodiversity, and animal welfare. This approach excludes the use of synthetic chemicals like pesticides and fertilizers, as well as genetically modified organisms (GMOs) and irradiation. Organic farming relies on techniques such as crop rotation, composting, and biological pest control to maintain soil quality and reduce environmental harm (European Commission, 2021; IFOAM – Organics International, 2022). Livestock raised organically are fed organic feed, access to the outdoors, and are treated humanely, without routine use of antibiotics or hormones (European Union, 2022). Food processing in organic systems minimizes synthetic additives and preserves the natural characteristics of the product (FAO, 2020).

2. Characteristics of Organic Food

Organic food comes from farming methods that focus on environmental sustainability and avoiding synthetic inputs like pesticides, fertilizers, and genetically modified organisms (GMOs) (Reganold & Wachter, 2016). These practices aim to support biodiversity, improve soil health, and often include strong considerations for animal welfare (Bengtsson et al., 2005). Many people see organic food as healthier and more natural, largely because it typically contains fewer chemical residues compared to conventionally grown food (Smith et

al., 2019). Organic certification also helps reassure consumers, as it confirms the food meets specific regulatory standards (USDA, 2023).

A key part of organic farming is the avoidance of synthetic pesticides and fertilizers. Instead of relying on chemicals, organic farmers use natural alternatives like compost, manure, and crop rotation to improve soil fertility and manage pests and diseases. While this approach helps minimize chemical residues, it does not completely eliminate them, since environmental pollution is widespread (Codex Alimentarius, 2013). Still, organic food handlers, processors, and retailers follow strict standards to preserve the integrity of organic products (Codex Alimentarius, 2013).

Organic standards also prohibit the use of GMOs. These are organisms (plants, animals, or microbes) whose DNA has been modified through modern biotechnology, often by transferring genes from one organism to another (FDA, 2024). By banning GMOs, organic farming ensures that food is produced without genetic modification (WHO, 2023).

Animal welfare is another important focus. In organic farming, livestock are raised with outdoor access and live on land that meets organic crop production standards (USDA, 2013). They are not treated with antibiotics or growth hormones. The goal is to support both their physical well-being and their ability to live in more natural conditions (The Animal Welfare Foundation, 2020).

Sustainability is at the heart of organic practices. Farmers use crop rotation and polyculture to maintain soil fertility and break pest and disease cycles without synthetic chemicals (Shennan et al., 2017). Cover crops and green manure add nutrients and organic matter to the soil, while composting and natural fertilizers reduce the need for outside inputs (Hovi et al., 2004). Integrated pest management, which includes using beneficial insects and natural predators, helps keep pests in check without harming the environment (Durham & Mizik, 2021). Water-saving methods like rainwater harvesting and drip irrigation help make the most of water resources (Shennan et al., 2017). On the livestock side, free-range systems and the avoidance of antibiotics support a balanced ecosystem and protect biodiversity (Hovi et al., 200) so all of these practices work together to make organic farming more resilient and environmentally friendly(Durham & Mizik, 2021).

3. Benefits of Organic Food

The popularity of organic food has surged, driven by its perceived advantages for health, environmental sustainability, and overall well-being. Many consumers prefer organic products because they are cultivated (or raised) without the use of any synthetic output, appealing to those who wish to avoid chemical residues in their diet (Janssen & Hamm, 2012; Pino et al., 2012), and because organic farming emphasizes sustainable practices in hope to lessen environmental impact (Smith, 2020). These elements contribute to the increasing demand for organic foods, which are often perceived as a healthier and eco-friendly choice compared to conventionally produced food (Johnson & Peters, 2018).

Various scientific studies support the health benefits of organic food (Smith et al., 2019). Organic foods typically have way lower pesticide residues compared to conventionally grown foods (Baudry et al., 2020). Organic meat and dairy products do not contain antibiotics or synthetic hormones, which can reduce the risk of certain health issues (Magkos et al., 2021). Some research also indicates that organic foods may contain higher levels of certain nutrients, such as antioxidants (Baranski et al., 2014).

Environmentally, organic farming practices contribute to improved soil health and reduced pollution (Reganold & Wachter, 2016). By avoiding synthetic chemicals and promoting biodiversity, organic farming helps maintain ecological balance (Bengtsson et al., 2005), lowers the carbon footprint of farming practices (Pimentel et al., 2005), and supports the sustainability of agricultural ecosystems (Seufert et al., 2012).

4. Organic Certification

The certification of organic food is regulated by extensive guidelines that define specific standards for its production, processing, handling, and labeling (Codex Alimentarius, 2013). Certifying organizations perform detailed inspections to verify that these standards are met, ensuring consumers that products labeled as organic adhere to strict criteria (USDA, 2023; European Commission, 2018). For a food product to be labeled as organic, it must satisfy the specific requirements established by these certifying authorities. For example:

- **USDA Organic (United States Department of Agriculture)**

Figure 1: USDA organic logo
Source:United States Department of Agriculture (USDA). (n.d.)

- **EU Organic (European Union)**

The AB logo and the *Eurofeuille* logo guarantee that a product meets European organic standards,while the *Eurofeuille* logo is mandatory in France. Most organic producers and products in Tunisia are certified AB and/or Bio.

Figure 2:AB and Bio EU organic logos
Source:Ministère de l'Agriculture et de la Souveraineté Alimentaire. (n.d.)

5. The Production of Organic Food in Tunisia

Organic food production in Tunisia has been gaining attraction, driven by both local demand and export opportunities. With its favorable climate, rich agricultural traditions, and growing awareness of sustainable practices, Tunisia is well-positioned to expand its organic agriculture sector.

5.1.Insight of organic Food production in Tunisia

Tunisia has 279,389 hectares of certified organic farmland, representing 2.87% of its total agricultural land. Most of its organic products are exported (Paull, 2024), with olive oil comprising 74% of exports and dates accounting for 22% (Paull, 2024). Tunisia was selected to host the 2024 Organic World Congress (OWC), the first in Africa, aiming to boost organic agriculture across the continent. However, the event was canceled in 2023 due to the pandemic and other challenges (Paull, 2024). Despite Tunisia's leadership in organics, the African continent still struggles with low organic production, with many countries reporting minimal or no organic farming (Paull, 2021).

5.2.Key Crops

Tunisia has emerged as a leading producer of organic farming, particularly within the Mediterranean region. The country's emphasis on sustainable agricultural practices has facilitated significant global exports, especially in products like organic olive oil and dates, which are major contributors to Tunisia's economy (Gharnit et al., 2020). The favorable climate and government initiatives promoting organic certification have further enhanced Tunisia's role in the global organic market (Gharbi et al., 2019). This strategic focus on organic agriculture has led to the cultivation of a diverse range of crops (Nefzaoui&Cherni, 2021).The key crops include:

- Olive oil
- Dates (*DegletNour* variety)
- Citrus fruits
- Vegetables
- Herbs and aromatic plants
- Cereals and grains

5.3.Regions

In Tunisia, various regions are prominent in organic agriculture, each with its own focus. Some are noted for organic olive production (FAO, 2020), while others concentrate on cereals, legumes, and vegetables (European Commission, 2021). Additional areas are distinguished by their organic fruit, viticulture, citrus, herbs, and medicinal plants (IFOAM – Organics International, 2022), with specific regions also excelling in organic date palms and plants adapted to dry climates (European Union, 2022).

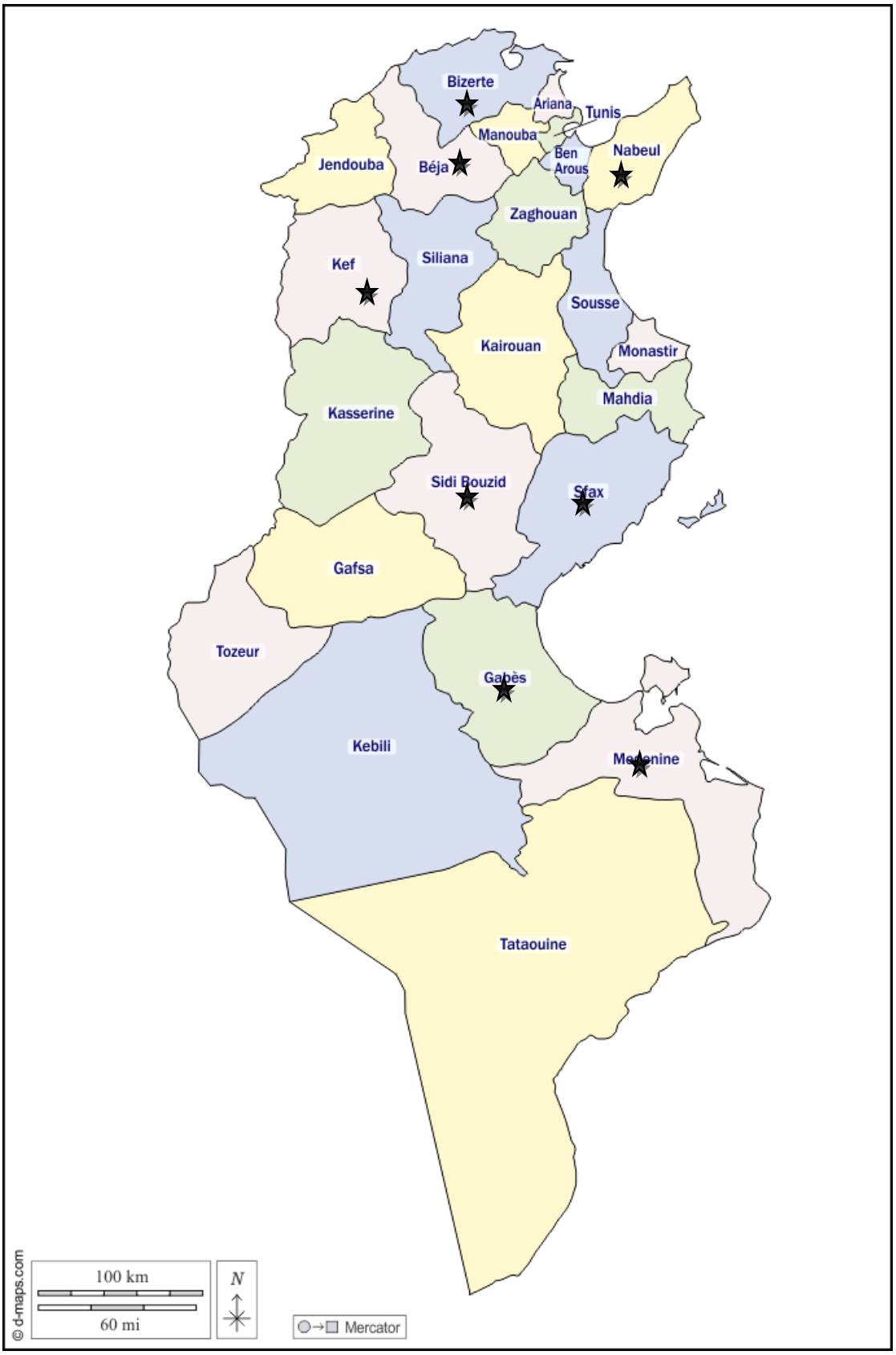

Figure 3: Organic product Regions
Source: d-maps.com. (n.d.)

- **Sfax**: Known for organic olives, vegetables, and fruits.
- **SidiBouzid**: Focuses on organic cereals, legumes, and vegetables.
- **Beja**: Produces organic grains and legumes.
- **Kef**: Specializes in organic fruits and vegetables.
- **Cap Bon**: Renowned for organic viticulture and citrus fruits.
- **Bizerte**: known for organic herbs and vegetables.
- **Gbes and Medenine**: Lead in organic date palm cultivation and medicinal plants.

5.4.Supporting Factors

Tunisia has emerged as a leading organic food producer in the region, benefiting from its favorable climate, fertile soils, and government support for sustainable agriculture driven by strong demand in export markets. The country's diverse climate, from the arid south to the fertile central and northern areas, enables the cultivation of a wide variety of organic crops (ONAGRI, 2023; Tunisian Ministry of Agriculture, 2023). The Tunisian government, in collaboration with international organizations, facilitates organic farming through subsidies, training, and certification programs, helping farmers adopt and sustain organic practices (Tunisian Ministry of Agriculture, 2023; IFOAM, 2023). Tunisia’s organic exports, particularly to Europe, are growing due to its strong certification systems that meet international standards, ensuring quality and safety. These certifications have enhanced trust with global buyers, allowing Tunisian producers to compete effectively in international markets (CEPEX, 2023; ITC, 2023).

6. Sustainability in Tunisia’s organic farming

Organic farming in Tunisia is gaining attention as a sustainable agricultural approach that aligns with the country's efforts to promote environmental conservation, economic resilience, and social equity. Tunisia, with its diverse climatic zones and rich agricultural heritage, is well-positioned to benefit from organic farming practices that reduce environmental impacts while enhancing rural livelihoods (Ben Kheder & M’Hamdi, 2017).

In Tunisia, organic farming practices such as crop rotation, composting, and the use of organic fertilizers are vital for maintaining soil health and fertility, particularly in combating

the challenges of soil degradation and desertification (Gharnit et al., 2020). These methods improve soil water retention, which is especially important in the country's arid and semi-arid regions where water scarcity (the demand for water exceeds the available supply) is a critical issue. Tunisia's organic sector plays a significant role in conserving biodiversity by avoiding harmful synthetic pesticides and herbicides, instead using integrated pest management and biological controls to maintain a balanced ecosystem that supports beneficial species like pollinators (animals or insects that transfer pollen from one flower to another) (El Bilali, 2019). Organic farming also contributes to climate change mitigation by reducing greenhouse gas emissions through practices like minimal tillage, cover cropping, and organic mulching, which enhance soil carbon sequestration. These techniques are essential for building resilience to droughts and extreme weather events, which became increasingly common in Tunisia (Ben Kheder & M'Hamdi, 2017).

Tunisia has experienced a rise in both domestic and international demand for organic products, largely due to increased consumer awareness of health and environmental issues (FAO, 2020). Organic certification has allowed Tunisian farmers to access premium markets in Europe and North America, where organic products command higher prices compared to conventional goods. Furthermore, organic farming in Tunisia, with its diverse cropping systems and minimal reliance on external inputs, provides greater resilience to market fluctuations and environmental challenges. This diversity helps stabilize farmers' incomes and reduces dependence on expensive imported agrochemicals, promoting long-term economic sustainability (El Bilali, 2019).

Organic farming in Tunisia plays a crucial role in rural development by fostering local economies and enhancing social cohesion. It promotes direct marketing through farmers' markets and community-supported agriculture (CSA), which strengthens the connection between farmers and consumers and supports local food systems (Ben Kheder & M'Hamdi, 2017). The organic sector encourages fair labor practices, ensuring safe working conditions, fair wages, and the empowerment of women and youth, particularly on smaller, family-run farms that prioritize worker welfare over industrial-scale operations (Gharnit et al., 2020). Organic farming also contributes to food security and public health by providing nutrient-rich crops and reducing harmful chemical exposure, aligning with national efforts to ensure access to safe and healthy food, particularly for vulnerable populations (FAO, 2020).

Organic farming in Tunisia, while beneficial, faces several challenges, including the high costs of certification, limited access to organic inputs, and insufficient infrastructure for storage and transportation. Moreover, many farmers lack familiarity with organic practices, creating a need for more technical support and training (Ben Kheder & M'Hamdi, 2017). Despite these obstacles, Tunisia has significant opportunities for growth in its organic sector, thanks to its favorable climate and proximity to European markets. Expanding government support, promoting organic certification, offering subsidies, and investing in research and development could help drive the sector's growth and sustainability (El Bilali, 2019).

II. Sustainable Determinants of Organic Food Consumption

The sustainable determinants of organic food consumption encompass a range of environmental, health, and socio-economic factors. Environmentally, consumers are motivated by the desire to reduce their ecological footprint, as organic farming practices contribute to soil health, biodiversity, and reduced pollution from synthetic chemicals (Reganold&Wachter, 2016; Bengtsson et al., 2005). Health considerations also play a crucial role, as organic foods are perceived to minimize exposure to harmful inputs, which aligns with a growing preference for cleaner and safer food options (Smith et al., 2019). Socio-economically, increased awareness and education about the benefits of organic products, combined with supportive policies and incentives from governments and organizationsdrive the shift towards organic consumption (USDA, 2023; IFOAM, 2023). These factors collectively contribute to a broader commitment to sustainability and personal well-being.

1. Health Awareness

Health awareness is a significant driver of organic food consumption. Consumers who prioritize their health often choose organic foods to avoid exposure to pesticides and other chemicals, which are commonly used in conventional agriculture (Smith et al., 2019). Studies have shown that organic foods frequently have higher nutritional value, including elevated levels of certain vitamins and antioxidants. These perceived health benefitsare a key factor that influences the growing preference for organic products among health-conscious consumers.

Health awareness is a significant driver of organic food consumption. Consumers who prioritize their health tend to choose organic food to avoid exposure to pesticides and other chemicals. Studies have shown that organic food often have higher nutritional value; higher levels of certain nutrients like vitamin C, magnesium, and iron (Baranski et al., 2014; Smith-Spangler et al., 2012) and may contain higher levels of antioxidants compared to conventionally grown foods (Baranski et al., 2014), which further supports health-conscious decisions.

2. Environmental concerns

Environmental concerns play a crucial role in the decision to purchase organic food. Consumers who are aware of the environmental impacts of conventional farming methods, such as soil degradation, water pollution, and loss of biodiversity, are more likely to support organic farming practices that promote sustainability (Reganold&Wachter, 2016; Bengtsson et al., 2005).

Organic farming is usually perceived as a more environmentally friendly option because it avoids synthetic chemicals and fosters practices that enhance soil health and protect natural ecosystems (Pimentel et al., 2005). Theseconcerns drive many consumers to choose organic products as a way to contribute to environmental conservation and sustainable agricultural practices.

3. Socio-Economic Factors

Economic development and urbanization significantly influence food consumption patterns. In fact, higher income levels can enhance purchasing power, enabling consumers to afford organic products, which are often priced higher than conventional (non-organic) ones (Miller & Rucker, 2015). As economic development progresses, consumers have greater financial flexibility to choose organic options. Additionally, urbanization brings lifestyle changes and improves access to a variety of food markets, including those offering organic products (Huang et al., 2017).

Urban areas typically have more supermarkets and specialized stores that stock organic foods, making these products more accessible to City residents (Jin& Kim, 2020). These factors

collectively contribute to the growing trend of organic food consumption in economically developed and urbanized regions.

4. Cultural Influences

Culinary traditions and agricultural heritage play a significant role in shaping food preferences. Traditional dietary habits and cultural values can influence the acceptance and demand for organic foods. For instance, cultures with a strong emphasis on natural and fresh ingredients often align with the principles of organic farming, which prioritizes using natural processes and avoids synthetic additives (Smith & Green, 2018).

Historical agricultural practices emphasizing sustainability and local food production also contribute to the acceptance of organic foods, as these practices resonate with contemporary organic principles (Harris et al., 2020). Thus, cultural attitudes towards food and agriculture can significantly affect the preference for and consumption of organic products.

5. Consumer Education and Awareness

Education and awareness among consumers about the benefits of organic food can significantly affect their consumption patterns. As consumers become more informed about the health benefits (such as reduced exposure to harmful pesticides) and the environmental advantages (such as improved soil health and reduced pollution), they are more likely to make informed choices that favor organic products (Gracia& de Magistris, 2008; Lockie et al., 2002).

An increased understanding of organic farming practices and their contributions to sustainability can also enhance consumers' willingness to pay a premium for organic goods (Schäufele& Hamm, 2017). Therefore, greater consumer education and awareness are crucial in driving demand for organic food and supporting more sustainable consumption practices.

6. Personal Values

Individual values, ethical considerations, and lifestyle choices play a significant role in consuming organic food. Consumers who prioritize ethical values, such as animal welfare and environmental stewardship, are more likely to choose organic products associated with higher standards of farming practices and reduced environmental impact (Harrison et al., 2005;

Thøgersen, 2010). Additionally, personal lifestyle choices that emphasize health and sustainability further influence this decision, as organic foods are often perceived as aligning with a holistic approach to well-being and ecological responsibility (Chen, 2007; McEachern&McClean, 2002). Thus, the interplay of personal values and lifestyle considerations is crucial in shaping consumer preferences for organic food.

7. Tunisia's case

Tunisia is increasingly adopting organic farming to promote sustainable agriculture, leveraging its agricultural heritage and evolving market dynamics. Despite challenges like limited awareness and higher costs, organic farming offers significant opportunities for growth through policy support and local initiatives.

Tunisia's long history of agriculture, with diverse crops and traditional practices, is vital to its economy and culture. Integrating these practices with modern organic methods can enhance sustainability by improving soil health and productivity while preserving local traditions (El Bilali, 2019). At the same time, economic growth and urbanization in Tunisia are changing consumer behavior, creating both opportunities and challenges for the organic market. As consumers demand healthier and safer food, understanding these shifts can help develop strategies to promote organic consumption (FAO, 2020).

Government policies are a key to supporting organic farming in Tunisia. Incentives, certification standards, and promotion of organic products can facilitate market growth and encourage farmers to transition to organic practices (Ben Kheder & M'Hamdi, 2017). In parallel, local initiatives, including associations and cooperatives, are raising awareness and providing support to farmers transitioning to organic farming. These groups help promote the benefits of organic agriculture through training and community engagement (Gharnit et al., 2020).

Studies show a growing interest in organic products among Tunisian consumers, driven by concerns about health, food safety, and sustainability. Understanding consumer preferences and barriers, such as price and availability, is essential to promoting organic consumption (El Bilali, 2019). While challenges for organic farming in Tunisia include higher costs, limited availability, and low consumer awareness, opportunities exist in educating consumers,

improving distribution, and leveraging supportive policies to grow the market (Ben Kheder & M'Hamdi, 2017).

III. Methodological Approach

This chapter describes the objectives of the study, the study design, sampling strategy, data collection instrument and procedure, data analysisincludingdescriptive statistics (frequencies and percentages, measures of central tendency and dispersion), factor analysis, internal reliability assessment with Cronbach's Alpha, and inferential statistics to identify key group differences(including non-parametric and parametric tests and its assumptions, namely, data normality assumptions and variances' homogeneity), and linear regression to assess purchase intention factors. Finally, the ethical issues are mentioned.

1. Objectives

The objectives of this study are to determine the socio-demographic factors influencing organic food consumption in Tunisia, assess economic constraints such as frequency of organic food purchase and household size, and identify key consumers' beliefs toward organic food,like attitudes, health awareness, environmental concerns, perceived price, and purchase intention. Additionally, the study aims to analyze market accessibility and distribution channels, evaluate barriers to organic adoption - including prices and consumers' knowledge about organic food - and apply statistical analysis to determine correlations between consumer perceptions, motivations, and purchase intentions.

2. Study Design

A quantitative, cross-sectional, observational, and analytical study was conducted, using a questionnaire in Google Forms. The study involves gathering and analyzing numerical data to identify trends and relationships within a population. It relies on structured methods, such as surveys and statistical analysis, to test hypotheses and draw conclusions (Creswell & Creswell, 2018). Being analytical, it examines connections between variables, while its observationalnature means data was collected without interference, ensuring an objective view of consumer behaviors (Babbie, 2020).

The cross-sectional design is well-suited for identifying patterns and trends within a population without requiring longitudinal data (a research design that involves repeated observations of the same variables), making it perfect for achieving research goals efficiently.

3. Sampling Strategy

This study adopts a convenience sampling approach to recruit Tunisian customers through an online survey (check the appendix). Although this non-random method may limit the broader applicability of the results, steps will be taken to include participants from diverse demographic groups, such as varying ages, genders, educational levels, and income brackets (ranges), to enhance the representativeness of the sample (Etikan et al., 2016; Bornstein et al., 2013).

To calculate the minimum sample size needed, a simple size calculator at a 95% confidence level (Calculator.net, n.d.) was usedto achieve statistical significance, ensuring the study can identify meaningful data patterns and correlations.

The Tunisian Population is approximately 12 million (11,850.232 as of 2023, according to the national statistics institute (INS, 2023); using the sample size calculator at a 95% confidence level from Calculator.net, thesample size lands at 385 individuals.

4. Data Collection Instrument and Procedure

The data was collected from October 2024 to November 2024 using a structured questionnaire developed from a comprehensive literature review on organic food consumption (DeVellis, 2016). The questionnaire includes multiple sections:

- **Demographic Information**: includes variables like age, gender, income, education, and location, which help understand consumer backgrounds and how they affect organic food choices.
- **Organic Food Consumption Behavior**: Questions regarding the frequency of organic food purchases, the types of organic products consumed, and typical purchasing locations. Understanding these behaviors, helps identify trends and consumer preferences in organic food consumption.

- **Attitudes and Beliefs**: provide insights into consumer perceptions, motivations, and values associated with organic products; items measuring attitudes towardorganic food and the intention to purchase these products, includinghealth awareness, environmental concerns, perceived price, and purchase intention(Table 1), using a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

Table 1: Determinants of Organic Products Purchase Intention

Dimensions	Statements
Attitudes	Buying organic products is logical and wise.
	The quality of organic products is better than non-organic.
	I trust the producers of organic food.
	I have no interest in buying organic food.
	I trust the organic certification label on the packaging.
	I am motivated to purchase organic products due to their beneficial properties.
	I do not trust the information contained on the organic product labels.
Health Awareness	Non-organic products are just as healthy as organic products.
	Organic products are natural, so they are better for my health.
	Organic products are healthier because they do not contain hormones.
	Organic products are healthier because they do not contain antibiotics.
	Organic products are healthier because they do not contain chemicals or toxic residues.
	I consider myself a health-aware consumer.
	I choose foods carefully to ensure they are healthy.
	I often think about issues related to health.
Environmental Concerns	The environmental balance is very vulnerable and can be disturbed easily.
	Human beings do not use the environment properly.
	Human beings must maintain the balance of the environment to ensure survival.
	Inappropriate human interference with the environment can lead to catastrophic consequences.
	The environment should be protected using adequate farming methods.
	Producing food products in a conventional way does not damage the environment.

	Organic food is better for the environment because chemical fertilizers and pesticides are used in smaller quantities or are not used at all. Organic food is better for the environment because hormones are used in smaller quantities or not used at all. Organic farming methods are better than conventional ones concerning the environment.
Perceived Price	The price of organic products is very important to me. I often refuse to purchase organic products because I think they are expensive. The price of organic products must be similar to that of non-organic products. I always try to find cheap food when I am shopping. I am willing to purchase organic products as long as they are sold at a lower price.
Purchase Intention	I am willing to purchase organic products while I am shopping. I will make an effort to purchase organic food soon.

Source: Bazhan, Sabet, and Borumandnia (2023)

- **Barriers to Organic Consumption**: Assessing perceived barriers, such as cost, availability, and trust in organic labels; identifying these barriers is crucial for addressing concerns and improving access to organic food.
- **Knowledge of organic Food**

  To evaluate the knowledge about organic food, each respondent was given 1 point each time they respondedcorrectly(Table 2)and 0 otherwise; the response "I don't know" was always given 0 points. For example, for the first statement "Pesticides and chemical fertilizers are used to produce organic food", if the respondent responds with "False", it was given 1 point, and if the response is "True" or "I don't know", it was given 0 points.

Table 2: Assessment of knowledge about organic Food

	Statements	Response
1	Pesticides and chemical fertilizers are used to produce organic food.	False
2	Hormones are used in organic food production.	False
3	Genetic modification is used in organic food production.	False
4	Antibiotics are not used in organic food production.	False
5	The nutritional value of organic food is higher than that of conventional food.	True
6	Organic food does not contain preservatives.	True
7	Human waste and animal manure are used to produce organic products.	True
8	It is difficult to know if food is produced organically.	False
9	Organic products taste better than conventional ones.	True
10	Small local farmers are supported by organic farming.	True

Source: Bazhan, Sabet, and Borumandnia (2023)

To ensure content validity, a pilot test was conducted with a small sample reflective of the study's target population (Artino, La Rochelle, Dezee, &Gehlbach, 2014). Feedback from this pilot guided adjustments and refinements to the questionnaire, such as organic products consumed in Tunisia,to enhance clarity and relevance.

Tunisian customers completed an online survey designed for this study. Before starting, they received a clear explanation of the research objectives and were asked to provide informed consent. The process prioritized ethical transparency, ensuring participants understand their involvement is voluntary and that their responses remain confidential and anonymous. These procedures align with updated ethical standards for online research.

5. Data Analysis

Analysis of collected data was done using the IBM SPSS trial version 30, following a multi-step process to cover both descriptive and inferential statistics (Field, 2017).

5.1.Descriptive Statistics

Descriptive analysis provides a summary of the sample characteristics and main variables:

- **Frequencies and percentages** for categorical variables (e.g., gender, income, education level).

- **Central tendency** (mean) and **dispersion measures** (standard deviation, minimum, and maximum) for continuous and ordinal variables (Pallant, 2020).

This analysis provides a general understanding of the socio-demographic characteristics of the respondents and organic food consumption behaviors and attitudes within the sample.

5.2.Factor Analysis

Factor analysis helps to find patterns in complex data by grouping related variables together (Hair et al.,2010), to identify underlying relationships between variables by reducing a large set of variables into fewer, meaningful factors. The significance level (α) in factor analysis is crucial for assessing the reliability of factor extraction and relationships. The **Kaiser-Meyer-Olkin (KMO) Test** evaluates sampling adequacy, with values above 0.7 considered acceptable for conducting factor analysis (Kaiser, 1974). **Bartlett's Test of Sphericity** determines whether correlations among variables are sufficient for analysis, with a p-value below 0.05 indicating statistical significance (Bartlett, 1950). Additionally, the significance of factor loadings is assessed, where loadings above 0.4 suggest meaningful relationships between observed variables and underlying latent constructs (Hair et al., 2010).

As shown in Table 1**,** organic food purchase behaviorsare analyzed using factor analysis to group multiple survey questions into five main categories: Attitudes (perceptions of organic products), Health Awareness (consumer health consciousness), Environmental Concerns (concerns about the environment and ecology), Perceived Price (perceptions of cost), and Purchase Intention (willingness to buy organic food) (Bazhan et al., 2023).

Instead of analyzing each survey question separately, this method allows to see how questions naturally group together, revealing the main factors that influence whether someone buys organic food (Johnson, 2021). For example, several statements about health benefits clustered together, showing that health awareness is a single important factor in decision-making (Brown, 2020). This makes it easier to understand what really matters to consumers when they decide whether to buy organic products (Lee & Park, 2019).

5.3.Reliability Analysis

Cronbach's Alphawas used to assess the internal consistency of the dimensions of the constructto measure attitudes and beliefs toward organic food. A Cronbach's Alpha value of 0.70 or above indicates acceptable reliability (Tavakol&Dennick, 2011). Items with low item-total correlations are reviewed and removed if necessaryto improve the overall reliability of the scale.

5.4.Inferential Statistical Tests

To compare the dimensions (attitudes, health awareness, environmental concerns, perceived price, and purchase intention)considering several socio-demographic factors (area of residence, gender, age, educational qualifications, net monthly household income, employment status, number of household members, number of children), the following parametric tests could have been used if the assumptions of thedata's normality and the variances' homogeneity were not violated.

To check if data is normal, the **Kolmogorov-Smirnov test** is used for large samples(Massey, 1951) and the **Shapiro-Wilk test** for small samples(Shapiro & Wilk, 1965). If the p-value is less than 0.05, the data is not Normal. To check group variances 'homogeneity, **Levene's test** is used(Levene, 1960). A p-value below 0.05 means the variances are not equal and the assumption of homogeneity is violated.

- **Student's t-test** is used to compare means between two independent groups (e.g., male vs. female) for variables such as organic food consumption frequency, assuming assumptions of normality and homogeneity of variance are met (Field, 2017).
- **One-way ANOVA**is used to compare mean scores across more than two groupsfor continuous variables. When ANOVA results are significant, Tukey's HSD*post-hoc* tests are used to identify specific group differences (Pallant, 2020).

If parametric assumptions (normalityof the data, homogeneity of variances) are violated, non-parametric testsare employed:

- The **Mann-Whitney** U test is used for two-group comparisons when the data do not follow a Normal distribution. This test evaluates whether the ranks of the two groups differ significantly, assessing whether one group tends to have higher or lower values

than the other. The variables should be measured on an ordinal scale, where the order matters, or a continuous scale, where the values can vary (Mann & Whitney, 1947).

- The **Kruskal-Wallis** test is applied for comparing more than two groups in non-parametric data scenarios. It is particularly useful when the assumptions of a one-way ANOVA are not met, such as when the data are not normally distributed or when sample sizes are small. The variable should be either ordinal or continuous (Kruskal& Wallis, 1952).

5.5.Linear regression Model

A linear regression model is applied to examine the relationship between purchase intention (dependent variable) and several independent variables, including attitudes, health awareness, environmental concerns, and perceived price. This statistical approach helps estimate how changes in these predictors influence consumer decisions regarding organic food purchases. The forward methodwas selected after testing the other methods, adding independent variables one by one based on statistical significance to ensure that only the most relevant predictors are retained in the final model (Hair et al., 2020).

To assess multicollinearity, Variance Inflation Factor (VIF) and Tolerance values are analyzed. Tolerance values close to 1 and VIF values below the threshold of 10 indicate minimal collinearity concerns, ensuring that predictor variables do not exhibit high interdependence (Field, 2018). The model's explanatory power is evaluated using the coefficient of determination (R^2), which measures the proportion of variance in purchase intention explained by the independent variables. Additionally, the adjusted R^2 value is considered to account for the number of predictors in the model, providing a more refined assessment of model fit (Montgomery et al., 2021).

The equation of the model used is as follows:

$$\mathbf{Y = \beta_0 + \beta_1.X_1 + \beta_2.X_2 + \beta_3.X_3 + \beta_4.X4 + \varepsilon}$$

Y - Purchase intention

X_1 – Attitudes

X_2 – Health awareness

X_3 – Perceived price

X_4 – Environmental concerns

β_0 – constant

$\beta_{1, \ldots, 4}$ – coefficients

ε – Random error

By implementing this regression analysis, the study identifies the key factors shaping consumer purchase intention for organic food in order to identify organic food consumption determinants in Tunisia.

6. Ethical Considerations

This research adheres to ethical guidelines, ensuring that all participants give their informed consent prior to data collection. Participation is voluntary, and all responses are kept confidential and anonymous.

IV. Results and discussion

The results are presented and discussed; Descriptive statistics of socio-demographic factors, purchasing behaviors, and knowledge about organic food. It also includes exploratoryfactor analysis, reliabilityanalysis, followed by inferential statistics and a regression model to identify key factors influencing organic food purchases. The results are discussed in relation to similar research.

1. Socio-demographic factors

According to Merriam-Webster (n.d.),socio-demographic factors combine both social and demographic characteristics to describe the population's traits, including factors like age, gender, income, education, and marital status.

According to Table 3, the sample included 400 participants and revealed a diverse group of individuals. Most respondents (98.5%) are Tunisian, with a slight female majority of 55.3% and 43.3% male, indicating a gender imbalance in the sample. Most respondents (77.5%) reside in urban areas, which typically provide better access to services and organic food

options. In contrast, 21.8% live in rural areas, where access to such products may be more limited.

Their ages ranged from 18 to 68, covering a wide span that includes multiple generations, with an average age of about 32 years (SD = 31.9), revealing a young adult-dominated sample.

Regarding marital status, the majority of participants are in stable relationships, with more than half (56.8%) beingmarried. About 35.8% are single, while a smaller portion includes those who are divorced (6.8%) or widowed (0.8%). This data highlights that most of the sample relationships are stable (Table 3).

Regarding educational qualifications, a significant number of participants (53.0%) have attained higher education, and 26.8% have completed their BAC (Baccalauréat is the final year of high school's diploma), which indicates that most individuals have pursued further studies after high school, reflecting a generally well-educated group.This is significantly higher than the national averages, where the gross enrollment rate for tertiary education stands at 38.45% (Trading Economics, 2023) and around 93% of individuals are enrolled in upper secondary education (Statista, 2023), indicating that a majority of the population pursues education beyond the compulsory years (primary education), as shown in Table 3.

Nearly half of the survey's respondents (49.3%) are employed, showing a notable level of economic engagement in the community, which is not far from Tunisia's employment rate of 46.3%(AllAfrica, 2024). However, it is concerning that 36.8% of participants are unemployed, indicating a serious economic issue affecting the group. This rate is much higher than that of the Tunisian population, where Tunisia's unemployment rate stood at approximately 15.8% in 2024 (Statista, 2024).

Around half of the participants reported that their household earnings are less than 2,000 Tunisian Dinars (TND), suggesting that many are in the lower to middle-income range. This indicates that many people face economic challenges, which can affect their financial security and access to basic needs, let alone organic food. Given the high unemployment rateand the young age of many individuals in this group, these income levels may significantly affect their overall quality of life and organic food consumption (Table 3).

Table 3: Sample characteristics

Variable	Category	Frequency	Percent (%)
Nationality	Tunisian	394	**98.5**
	Other	5	1.3
	Missing	1	0.3
Area of Residence	Rural	87	**21.8**
	Urban	310	77.5
	Missing	3	0.8
Gender	Male	173	43.3
	Female	221	**55.3**
	Missing	6	1.5
Educational Qualifications	Higher Education	212	**53.0**
	BAC	107	26.8
	High School	67	16.8
	Secondary	14	3.5
	Missing	0	0.0
Marital Status	Single	143	35.8
	Married/ Cohabiting	227	**56.8**
	Divorced/Separated	27	6.8
	Widowed	3	0.8
	Missing	0	0.0
Net Monthly Household Income in TND	<2,000	200	**50.0**
(Tunisian Dinar)	2,000 – 2,500	125	**31.3**
	3,000 – 3,500	48	12.0
	3,500 – 4,000	13	3.3
	> 4,000	14	3.5
	Missing	0	0.0
Employment Status	Employed	197	**49.3**
	Unemployed	147	**36.8**
	Student	52	13.0
	Retired	4	1.0
	Missing	0	0.0

Number of Household Members	1 member	22	5.5
	2 members	35	8.8
	3 members	116	**29.0**
	4 members	126	**31.5**
	More than 4 members	101	**25.3**
	Missing	0	0.0
Number of Children (under 18 years)	None	149	**37.3**
	1 child	156	**39.0**
	2 children	76	19.0
	3 children	18	4.5
	More than 3 children	1	0.3
	Missing	0	0.0

The data shows that the majority of respondents live in larger households, with 31.5% having four members and 29.0% having three members. Together, these groups represent a significant portion of the surveyed sample, indicating that multi-member households are common in the studied sample.

A considerable percentage of households (37.3%) do not have children under 18 years old, while the largest group (39.0%) has one child. This suggests that many families may be in the early stages of child rearing, which could influence their spending habits and priorities, particularly related to organic food consumption.

Overall, the demographics regarding household size and the presence of children can significantly influence family needs and preferences in food purchases.

Comparing the findings with a similar research (Santiago et al., 2024, 2025)shows both similarities and differences in organic food consumption. Both studies included more women than men, though this trend was stronger in Portugal (59.8%*versus* 55.3%). Education was important in both countries, with Portugal having more highly educated consumers. Most participants in both studies lived in cities (77.5% in Tunisia, 69.2%in Portugal). The Tunisian sample faces greater economic challenges, with higher unemployment (36.8% *versus* 22.1%) and lower incomes. Portuguese consumers were older on average (44.7 years *versus* 32 years). Tunisian households were typically larger (many with four members) than Portuguese ones

(average 2.8 members). Despite these differences, consumers in both countries bought organic food mainly for health reasons, showing some common motivations across different cultures.

Figure 4displays the percentage distribution of respondents by district of residence. The data shows that Tunis has the highest percentage of respondents (15.8%),followed by Ariana (10%), and Sousse(7.8%). Other notable districts include Nabeul (7%), Sfax(6.3%), and Bizerte (5.3%).The lower percentages are observed in Monastir (3.8%), Sidi Bouzid (3.5%), Manouba (3.5%), and Gafsa (3.3%), and the other 14 districts with lower percentages. This indicates that most respondents are concentrated in major urban areas, particularly Tunis**,** Ariana**,** Sousse, Nabeul, Sfax, and Bizerte, due to the concentration of the Tunisian population in these areas, and may suggest a higher interest or accessibility to organic food in these regions.

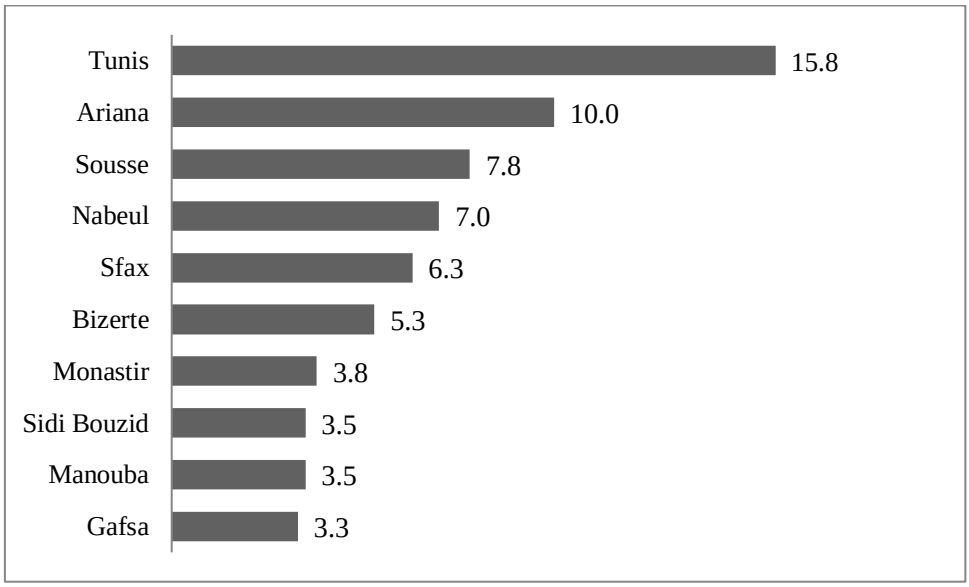

Figure 4: Distribution of Respondents by District of Residence(%)

2. Purchasing Behaviors of Organic Food

Many respondents, about 46.5%, do not buy organic food at all. Among those who do, most purchase them just once a year (23.8%), which might suggest that they are not fully aware of the benefits or simply cannot access these products easily. The number of people who buy organic items regularly, like once a month or every week, is quite low. This indicates that there are likely barriers that prevent frequent purchases(Figure 5).

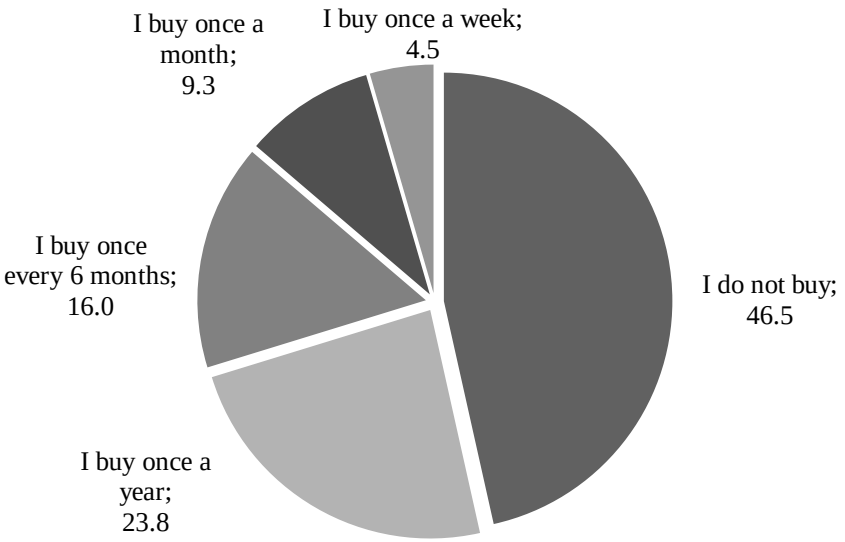

Figure 5: Frequency of Organic Food purchases (%)

The data on who decides to buy organic foods gives some interesting insights. Most respondents, 42.0% (168 individuals), say they make these choices themselves. This indicates that many people are invested in their food choices and likely understand the benefits of organic food. However, it is also clear that family dynamics play a significant role in people's purchases. About 38.8% (155 respondents) said that any family member could make their own choices. On the other hand, 9.3% (77 respondents) rely on their partners to make decisions about organic purchases(Figure 6).

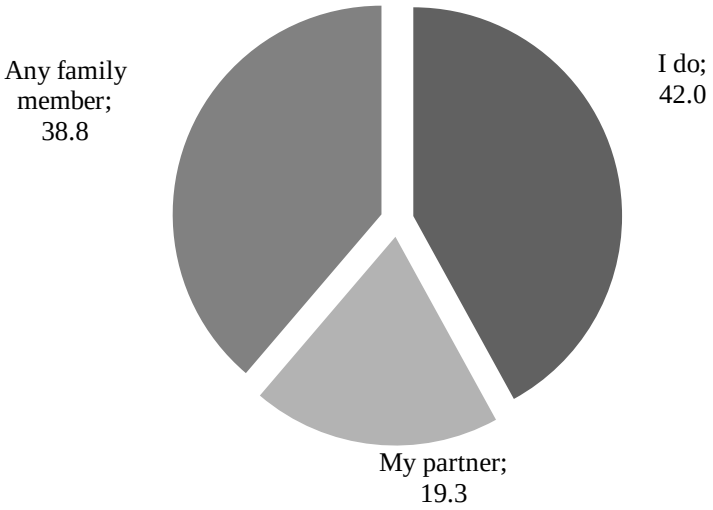

Figure 6: Decision to purchase organic products (%)

Figure 7 shows insights into the buying habits of organic products among Tunisia's population. Olive oil is the most popular, with 54.5% saying they purchase it, likely due to its health benefits and its appeal in Tunisia's cuisine. Dates are also popular, with 50.5% of respondents buying them, reflecting their cultural significance in Tunisia and their high nutritional value. Organic honey is chosen by 31.3% of participants, indicating a preference for natural sweeteners. Interest in organic fresh fruits (21.3%) and vegetables (12.8%) is lower, suggesting that there might be barriers like price or accessibility keeping people from buying these options. Medicinal and aromatic plants have the least interest (7.5%), due to limited awareness of their benefits. Jam and pastry products are rarely purchased in organic form, with very low percentages. 46.5% of respondents do not buy any of the listed organic products, highlighting a huge segment of the sample that may be disengaged from organic consumption. Overall, while there is a clear preference for certain organic items, there is a need to address the barriers preventing the purchase of organic food.

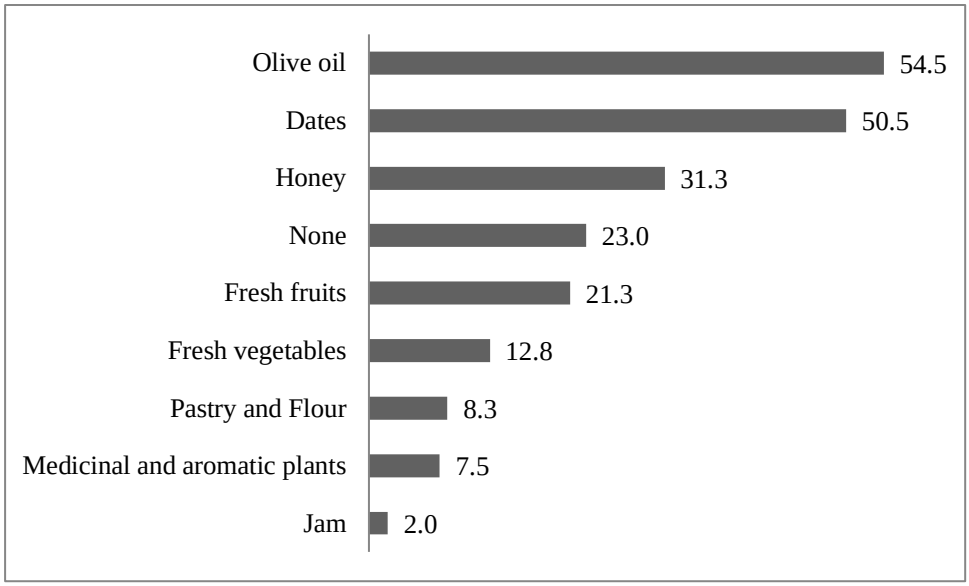

Figure 7: Organic food purchased (%)

According to the results presented in Figure 8, the most popular place for buying organic products is the supermarkets, where (49.8%) of people purchase this type of goods; hypermarkets are in the second place (37.0%), there are fewer people who buy directly from farmers (31.3%), as for the local fairs or markets; they attract only 18.5% of the buyers. The least interesting place among them is the organic product store with 13.3%.In addition, a handful of people rely on delivery services for baskets (1.0%) or buy online (1.5%). This suggests that while many prefer shopping at supermarkets and hypermarkets, there may be less interest in specialized options for organic products,or they may be limited, possibly due to these options being more accessible in larger cities and wealthier neighborhoods.

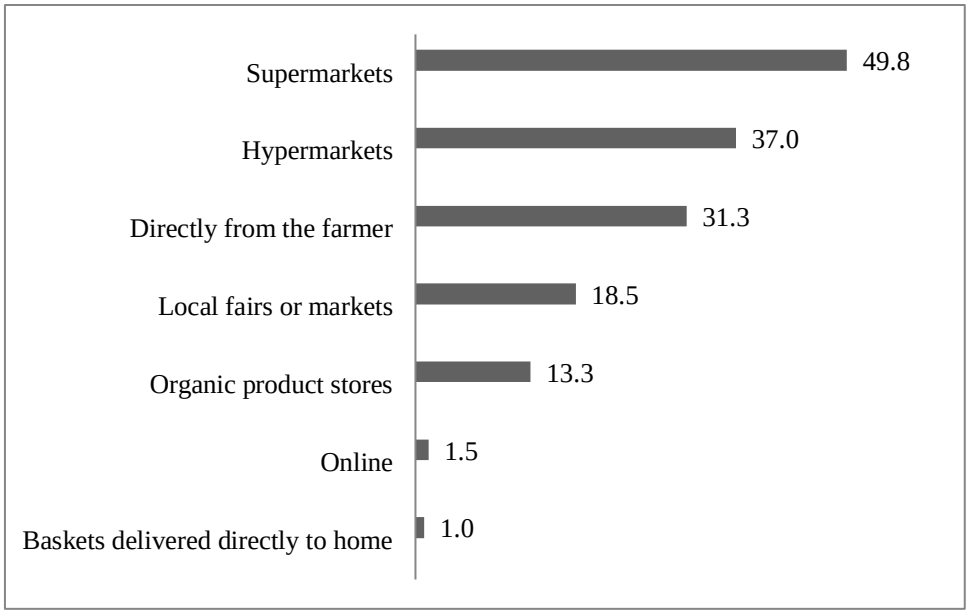

Figure 8: Purchase location (%)

3. Knowledge about organic Food

The classification results are based on a five-point scale that measures performance percentages across defined ranges: 0-19% is rated as *Very Insufficient*, 20-49% as *Insufficient*, 50-69% as *Sufficient*, 70-89% as *Good*, and anything above 89% is considered *Very Good*. This scale provides a clear framework for evaluating achievement levels, from very poor to excellent performance.

The distribution of results in Figure 9shows a significant concentration in the lower categories, with 29%of participants rated as *Very Insufficient* and 31.3%as *Insufficient*, indicating that over 60%of respondents scored below the satisfactory level of 50%. These results reveal a significant lack of knowledge about organic food among the majority of participants. Meanwhile, 17.3%achieved a*Sufficient* rating, indicating an average performance within the 50 - 69% range. Higher performance levels were less common, with only 13.8%of participants rated as *Good* and just 8.8%reaching the *Very Good* category by scoring above 89%. The cumulative percentages reveal that nearly 77.5%of participants fell short of the *Good* performance range.

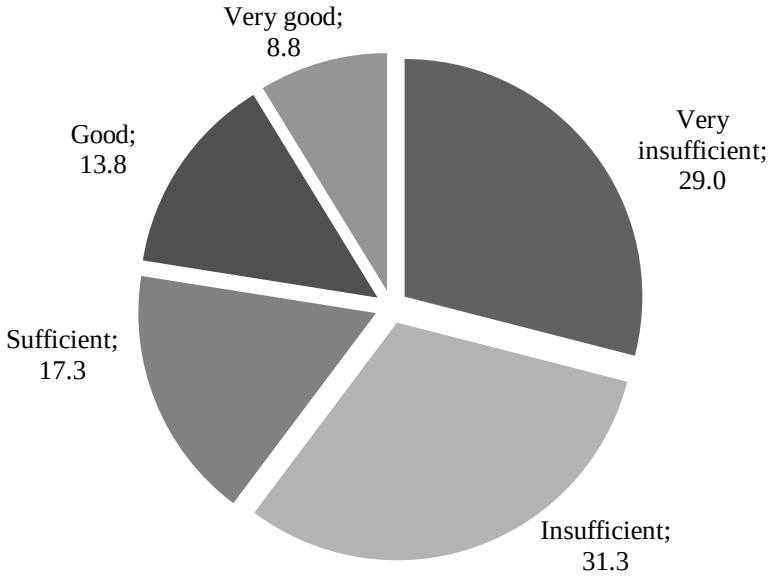

Figure 9: Classification of organic food knowledge (%)

4. Exploratory Factor Analysis (EFA) and Reliability

After assigning each item to its corresponding dimension of organic food purchase intention's determinants, an exploratory factor analysis was conducted for five dimensions: Purchase Intention, Attitudes, Health Awareness, Environmental Concerns, and Perceived Price. This analysis examines the suitability of the data for Principal Component Analysis (PCA) and the variance explained by each factor.

The results in Table 4 indicate that each dimension is well-suited for factor analysis, as shown by the Kaiser-Meyer-Olkin (KMO) values and the significance of Bartlett's test. The Purchase Intention dimension, for instance, has a KMO value of 0.500 and explains 97.357% of the variation, while the Attitudes dimension has a strong KMO value of 0.845, with a single factor explaining 72.57% of the variance. Similarly, Health Awareness, Environmental Concerns, and Perceived Price exhibit strong factor structures, with KMO values of 0.830, 0.926, and 0.700, respectively, indicatingthat the data is well suited for factor extraction. The high factor loadings across all dimensions confirm that the variables within each construct measure the intended concept effectively.

Table 4: Results of the Exploratory Factor Analysis

Dimensions	Item	Chi-square	Communalities	Variance %	Factor loadings
Purchase intention	1		0.974		0.987
KMO =0.5	2	901.526	0.974	97.357	0.987
p-value< 0.01					
Eigenvalue = 1.945					
Attitudes	1		0.760		0.872
KMO = 0.845	2		0.739		0.859
p-value < 0.01	3		0.702		0.838
Eigenvalue = 3.629	4	1262.807	0.711	72.570	0.843
	5		0.716		0.846
Health awareness	1		0.780		0.798
KMO = 0.830	2		0.780		0.827
p-value< 0.01	3	1355.342	0.811	72.149	0.866
Eigenvalue = 3.607	4		0.781		0.883
	5		0.758		0.871
Environmental	1		0.821		0.906
concerns	2		0.807		0.898
KMO = 0.926	3		0.855		0.925
p-value< 0.01	4	2286.443	0.847	79.820	0.920
Eigenvalue = 4.789	5		0.745		0.863
	6		0.714		0.845
Perceived price	1		0.757		0.870
KMO = 0.700	2	424.904	0.778	73.189	0.882
p-value< 0.01	3		0.661		0.813
Eigenvalue = 2.196					

To ensure the consistency and reliability of the measured dimensions, mean scores, standard deviations, and Cronbach's Alpha values were examined (Table 5). The findings indicate strong internal consistency across all dimensions, with Cronbach's Alpha values ranging from 0.775 to 0.973. The Purchase Intention dimension had the highest reliability, with a Cronbach's Alpha of 0.973 and a mean score of 3.40, indicating a highly stable measurement.

The Attitudes dimension also demonstrated strong reliability (Cronbach's Alpha = 0.908) with an average score of 3.55, reflecting relatively consistent consumer perceptions. Although the Health Awareness dimension had the lowest Cronbach's Alpha (0.775), it remained within an acceptable range, suggesting a reliable measure. Meanwhile, Environmental Concerns (Cronbach's Alpha = 0.884; mean = 3.76) and Perceived Price (Cronbach's Alpha = 0.825; mean = 4.07) also exhibited strong internal consistency. These results confirm that the items within each dimension reliably capture consumer perspectives on organic food.

Table 5: Characterization and Reliability of the Dimensions

Dimensions	**Mean ($\bar{x}$)**	**Standard Deviation (SD)**	**Reliability**		**Dimensions Level**
			Cronbach's Alpha	**Classification**	
Purchase intention	3.40	0.947	0.973	Very Good	Below Moderate
Attitudes	3.55	0.614	0.908	Very Good	Moderate
Health awareness	3.67	0.349	0.775	Acceptable	Moderate
Environmental concerns	3.76	0.472	0.884	Good	Moderate
Perceived price	4.07	0.494	0.825	Good	Moderate

Legend: From 1 to 3.44: Below moderate; from 3.45 to 4.44: Moderate; from 4.45 to 5: Above moderate.

The factor analysis shows that each dimension, namely Purchase Intention, Attitudes, Health Awareness, Environmental Concerns, and Perceived Price, isclearly captured by a single factor with high loadings and strong reliability. This indicates that the measures used are consistent and effectively reflect consumers' views on organic food.

The factor analysis in the study aligns with findings from previous research conducted in Portugal (Santiago et al., 2024, 2025); both studies highlight the importance of attitudes, health awareness, and environmental concerns in shaping purchase intentions.

In the current study, these dimensions are capturedby single factors with high loadings and strong reliability, indicating consistent consumer views. Santiago et al. (2024, 2025)researchemphasizes trust and cultural factors as determinants, while both studies underscore the role of health awareness in organic food choices.

5. Inferential statistics

After testing the assumptions of the parametric test, using the **Kolmogorov-Smirnov** test with the Lilliefors correction ($n \geq 30$) and the **Shapiro-Wilk** test ($n < 30$) to test the normality of the data and the **Levene test** to test the homogeneity of variances, **Student t-test** and **One-way ANOVA**tests could not be used. In fact, the data were not normally distributed; that is, this assumption of the parametric tests was not met.

Non-parametric tests (**Mann-Whitney U** test and **Kruskal-Wallis** test)wereused instead to identify differentiating factors ofthe 5 considered dimensions, namely, attitudes, health awareness, environmental concerns, perceived price, and purchase intention.

5.1.Attitudes

The non-parametric analysis in Table 6shows significant differences in attitudes toward organic food based on various demographic factors. P-value< 0.001 indicates that the difference is strongly significant. Urban residents have a higher mean rank (mean rank =210.84)compared to rural residents (mean rank=137.49)due to better access to organic food and greater exposure to sustainability.

The difference between the two genders is strongly significant (p-value< 0.001). Women show a more favorable attitude toward organicfood (mean rank = 216.02) than men. While age group does not significantly affect attitudes (p-value= 0.792), Education does (p-value< 0.001), with higher-educated individuals showing more positive attitudes than others with lower educational qualifications, with the highest mean rank (258.34), while the least educated has the least mean rank (105.39), as shown in Table 6.

Net monthlyhouseholdincome is another significant factor (p-value= 0.000), as attitudes become more favorable with higher income levels (mean rank = 362.75) for those earning above 4,000TND, due to the affordability of organic food (Table 6).

Table 6: Attitudes

Variable	Groups	N	Mean Rank	P-value
Area of residence	Urban	305	**210.84**	0.000*
	Rural	84	137.49	
Gender	Female	217	**216.02**	0.000*
	Male	169	164.59	
Age Group	18-28	147	191.01	0.792
	29-38	29	200.12	(NS)
	>38	215	198.85	
Educational qualification	Primary	-	-	0.000*
	Secondary	14	105.39	
	High school	62	113.53	
	BAC	104	132.17	
	Higher education	212	**258.34**	
Net monthly household income (TND)	<2,000	196	149.80	0.000*
	2,000-2,500	121	203.64	
	3,000-3,500	48	278.42	
	3,500-4,000	13	352.58	
	>4,000	14	**362.75**	
Employment status	Employed	195	**239.11**	0.000*
	Unemployed	143	134.90	
	Student	50	215.37	
	Retired	4	85.75	
Number of household members	1 member	22	**268.50**	0.000*
	2 members	34	204.15	
	3 members	115	225.26	
	4 members	122	181.80	
	>4 members	99	162.59	
Number of children	None	147	**217.41**	0.001*
	1 child	153	197.64	
	2 children	73	170.69	
	3 children	18	131.56	
	>3 children	1	1.00	

*Significant at the 1% significance level. **Significant at the 5% significance level.
NS: Not significant

Employment status significantly affects attitudes (p-value< 0.001), with employed individuals and studentshaving the highest mean rank (respectively 239.11 and 215.37), while retired and unemployed individuals haveless favorable attitudes due to financial constraints (Table 6).

Household size (p-value< 0.001) and the number of children (p-value= 0.001) also influence attitudes, as individuals who live alone (mean rank = 268.50) and those with no to one child (mean rank = 217.41) tend to have the highest mean ranks, reflecting financial concerns in larger households (Table 6).

5.2.Health Awareness

Health awareness is a key factor influencing attitudes toward organic food. According to Table 7, the difference between urban and rural residents is significant (p-value< 0.001).Urban residents have significantly higher health awareness(mean rank=212.98**)** than rural residents due to better access to health-related information and organic products.

Women also exhibit greater health awareness with a mean rank (213.75) higher than men (mean rank = 161.16), supporting the trend that women are generally more invested in health and nutrition. Age shows a small but significant effect (p-value= 0.037), with individuals aged 29-38 demonstrating the highest health awareness (Table 7).

Educational qualifications play a crucial role (p-value< 0.001), with those having higher education showing the greatest health awareness (mean rank = 249.46), as shown in Table 7.

Net monthly household income also has a significant impact (p-value< 0.001); wealthier individuals with an income higher than 3,500TND ranking higher in health awareness than others (mean rank = 349.65 and311.92)indicating that they can afford healthier lifestyle choices (Table 7).

Employment status is another determinant (p-value< 0.001), with employed individuals having significantly higher mean rank (mean rank=231.32**)** than unemployed individuals and retirees (Table 7).

Table 7: Health Awareness

Variable	Groups	N	Mean Rank	P-value

Area of residence	Urban	298	**212.98**	0.000*
	Rural	85	118.44	
Gender	Female	212	**213.75**	0.000*
	Male	168	161.16	
Age Group	18-28	146	178.88	0.037**
	29-38	27	**235.13**	
	>38	212	197.36	
Educational qualification	Secondary	13	141.92	0.000*
	High school	63	97.91	
	BAC	105	147.98	
	Higher education	205	**249.46**	
Net monthly household income(TND)	<2,000	190	149.28	0.000*
	2,000-2,500	122	203.25	
	3,000-3,500	48	269.41	
	3,500-4,000	13	**349.65**	
	>4,000	13	**311.92**	
Employment status	Employed	192	**231.32**	0.000*
	Unemployed	141	144.90	
	Student	49	194.08	
	Retired	4	84.13	
Number of household members	1 member	20	**247.50**	0.001*
	2 members	35	197.21	
	3 members	109	**220.51**	
	4 members	125	183.94	
	> 4 members	97	162.99	
Number of children	None	141	**205.97**	0.016**
	1 child	151	**199.36**	
	2 children	75	174.69	
	3 children	18	135.69	
	> 3 children	1	2.00	

*Significant at the 1% significance level. **Significant at the 5% significance level.
NS: Not significant

Household size and the number of children also influence health awareness, with individuals from smaller households (mean rank=247.50 and 220.51**;** p-value= 0.001) and those with no

or fewer children (mean rank=205.97199.36**;** p-value= 0.016) exhibiting higher awareness, possibly due to financial issues and less mouths to feed (Table 7).

5.3.Environmental Concerns

Environmental concerns significantly influence the preference for organic food according to Table 8. The difference is strongly significant (p-value< 0.001), urban residents show greater concern for environmental issues with higher mean rank (218.82) compared to rural residents.

The difference is significant between the two genders (p-value< 0.001); women demonstrate higher environmental concern (mean rank = 214.10)than men do (mean rank = 169.88), as shown in Table 8.

Education is a key factor (p-value< 0.001), as individuals with higher education levels show greater environmental awareness (mean rank=265.48).

Net monthly householdincome displays a significant difference across the groups (p-value< 0.001), with higher-incomeindividuals of more than3,500 TND (mean rank351.73 and 330.86)showing more concern for the environment suggesting they tend to purchase organic food for sustainability reasons (Table 8).

Employment status influences environmental concerns as well (p-value< 0.001), with employed individuals displaying greater awareness (mean rank=232.54)than unemployed individuals (Table 8).

Age and household size do not show significant differences (p-value=0.570**;** p-value = 0.062) suggesting these factors do not strongly influence the outcome. However, the number of children has a significant impact (p-value<0.001)**,** with individuals without children ranking the highest(mean rank=225.04) while those with more children rank progressively lower (Table 8).

Table 8: Environmental Concerns

Variable	Groups	N	Mean Rank	P-value
Area of residence	Urban	304	**218.82**	0.000*
	Rural	87	116.28	
Gender	Female	216	**214.10**	0.000*
	Male	172	169.88	
Age Group	18-28	148	199.39	0.570
	29-38	29	215.48	
	>38	216	192.88	(NS)
Educational qualification	Secondary	14	78.64	0.000*
	High school	66	94.00	
	BAC	105	143.09	
	Higher education	209	**265.48**	
Net monthly household income(TND)	<2,000	196	143.46	0.000*
	2,000-2,500	123	223.05	
	3,000-3,500	48	272.03	
	3,500-4,000	13	351.73	
	>4,000	14	**330.86**	
Employment status	Employed	194	**232.54**	0.000*
	Unemployed	145	138.38	
	Student	51	**242.63**	
	Retired	4	65.63	
Number of household members	1 member	21	244.50	0.062
	2 members	34	200.51	
	3 members	115	211.35	(NS)
	4 members	124	192.85	
	>4 members	100	176.44	
Number of children	None	147	**225.04**	0.000*
	1 child	154	192.35	
	2 children	74	168.92	
	3 children	18	145.00	
	>3 children	1	2.00	

*Significant at the 1% significance level. **Significant at the 5% significance level.
NS: Not significant

5.4.Perceived price

According to Table 9, the perceived price of organic food varies among different demographic groups. There is no significant difference in price perception between urban and rural residents (p-value= 0.485), suggesting that both groups find organic food relatively expensive. Similarly, gender does not significantly affect perceived price (p-value = 0.602), indicating that men and women view organic food costs similarly.

Age also does not significantly affect price perception (p-value= 0.215), implying that financial concerns about organic food exist across all age groups. However, net monthly household income plays a crucial role (p-value< 0.001), with higher-income individuals (mean rank = 38.32) perceiving organic food as more affordable compared to lower-income groups (mean rank = 205.46 and 230.81).

Employment status does not significantly affect price perception (p-value = 0.581), reinforcing the idea that affordability concerns are primarily driven by income rather than job status (Table 9).

Household size and the number of children do not significantly influence price perception (p-value = 0.326; p-value = 0.062), suggesting that overall financial status is the key factor affecting whether organic food is seen as expensive (Table 9).

Table 9: Perceived Price

Variable	Groups	N	Mean Rank	P-value
Area of residence	Urban	302	197.13	0.485
	Rural	87	187.62	(NS)
Gender	Female	218	190.43	0.602
	Male	167	196.36	(NS)
Age Group	18-28	147	182.73	0.215
	29-38	29	200.84	(NS)
	>38	214	203.55	
Educational qualification	Secondary	14	207.61	0.833
	High school	66	191.25	(NS)
	BAC	104	203.42	
	Higher education	207	193.00	
Net monthly household	<2,000	196	**205.46**	0.000*
income(TND)	2,000-2,500	121	**230.81**	
	3,000-3,500	47	135.20	
	3,500-4,000	13	118.88	
	>4,000	14	38.32	
Employment status	Employed	195	193.77	0.581
	Unemployed	143	203.98	(NS)
	Student	49	185.52	
	Retired	4	147.75	
Number of household members	1 member	22	187.30	0.326
	2 members	35	210.30	(NS)
	3 members	114	200.82	
	4 members	121	204.88	
	>4 members	99	176.47	
Number of children	None	147	193.50	0.062
	1 child	152	193.35	(NS)
	2 children	73	219.77	
	3 children	18	153.03	
	>3 children	1	4.00	

*Significant at the 1% significance level.**Significant at the 5% significance level.
NS:Not significant

5.5.Purchase intention

According to Table 10, there is a significant difference between urban and rural residents (p-value < 0.001); the intention to purchase organic food is significantly higher among urban residents (mean rank = 215.94) than rural residents, due to better availability and accessibility of organic products in cities.

Gender plays a role (p-value< 0.001), where women show higher purchase intention (mean rank = 217.26) than men consistent with their greater health awareness and environmental concerns (Table 10).

Age does not significantly affect purchase intention (p-value= 0.150), but education plays a crucial role (p-value< 0.001), with purchase intention increasing as education levels rise. Income also significantly influences purchase intent (p-value< 0.001), as higher-income individuals are more willing to buy organic food (mean rank = 356.19 and350.29),highlighting affordability as a key barrier for lower-income consumers(Table 10).

Employment status further affects purchase intention(p-value< 0.001), with employed individuals more likely to buy organic food (mean rank = 245.00) than unemployed individuals (Table 10).

Household composition also plays a role, with fewer household members correlating with higher purchase intention (p-value= 0.000); those living alone have the highest mean rank (mean rank = 262.32), while households with more than four members show the lowest (mean rank = 163.29), as shown in Table 10.

The number of children is also a significant factor (p-value = 0.040), as individuals with no children (mean rank= 214.52) exhibit a higher purchase intention compared to those with multiple children (Table 10).

Table 10: Purchase Intention

Variable	Groups	N	Mean Rank	P-value
Area of residence	Urban	309	**215.94**	0.000*
	Rural	87	136.56	
Gender	Female	220	217.26	0.000*
	Male	173	171.23	
Age Group	18-28	150	185.49	0.150(NS)
	29-38	29	206.36	
	>38	219	208.18	
Educational qualification	Secondary	14	99.46	0.000*
	High school	67	138.84	
	BAC	107	152.25	
	Higher education	211	**250.31**	
Net monthly household income (TND)	<2,000	200	155.31	0.000*
	2,000-2,500	125	204.98	
	3,000-3,500	47	288.95	
	3,500-4,000	13	**356.19**	
	>4,000	14	350.29	
Employment status	Employed	196	**245.00**	0.000*
	Unemployed	147	144.97	
	Student	52	191.79	
	Retired	4	124.25	
Number of household members	1 member	22	**262.32**	0.000*
	2 members	34	190.15	
	3 members	116	231.46	
	4 members	126	192.24	
	>4 members	101	163.29	
Number of children	None	148	**214.52**	0.040**
	1 child	156	200.17	
	2 children	76	186.67	
	3 children	18	144.08	
	>3 children	1	44.00	

*Significant at the 1% significance level. **Significant at the 5% significance level.
NS: Not significant

6. Regression Model

The regression analysis (Table 11) aimed to predict Purchase Intention using a forward selection method, where predictors are added one by one based on their statistical significance (p-value ≤ 0.050). In Model 1, Attitudes was the first variable included, yielding an R^2 of 0.644, meaning that 64.4% of the variance in purchase intention was explained by attitudes alone. Model 2 introduced Health Awareness, slightly improving the model's explanatory power ($R^2 = 0.649$), indicating that health-consciousness contributes to purchase intention but to a lesser extent than attitudes. Finally, Model 3 added Perceived Price, further increasing R^2 to 0.654, suggesting that price perception also plays a role in shaping consumer purchase intention. The Adjusted R^2 rose from 0.643 to 0.652, and the standard error decreased from 0.625 to 0.618, indicating improved model accuracy with each added variable.

Table 11:Model Summary of Regression Analysis

Model	R	R^2	Adjusted R^2	Std. Error	Predictors
1	0.803	0.644	0.643	0.625	(Constant), Attitudes
2	0.806	0.649	0.647	0.622	(Constant), Attitudes, Health awareness
3	0.809	0.654	0.652	0.618	(Constant), Attitudes, Health awareness, Perceived price

Dependent Variable: Purchase intention

According to Table 12, Attitudes ($\mathbf{X_1}$) emerged as the strongest predictor of organic food purchasing behavior, with the highest coefficient ($\beta_1 = 1.051$) and statistical significance (p-value < 0.001). This suggests that for each unit increase in a positive attitude toward organic food, purchase intention increases by approximately 1.05 units, holding other factors constant. Health awareness ($\mathbf{X_2}$) is the second most influential factor ($\beta_2 = 0.265$; p-value = 0.005), indicating that consumers who are more health-conscious are significantly more likely to purchase organic foods, although its impact is substantially smaller than attitudes. Perceived price ($\mathbf{X_3}$) has a significant negative effect ($\beta_3 = -0.110$; p-value = 0.013), confirming that higher perceived prices discourage organic food purchases, aligning with the economic barriers mentioned earlier. Meanwhile, environmental concerns ($\mathbf{X_4}$) were not included the final model due to non-significance (p-value = 0.224), reinforcing the earlier observation that

environmental concerns play a lesser role in Tunisian organic food consumption compared to health factors.

The final regression equation is:

$$\mathbf{Y = -0.836 + 1.051X_1 + 0.265X_2 - 0.110X_3}$$

The model diagnostics reveal some multicollinearity among predictors, with Variance Inflation Factor (VIF) values indicating moderate multicollinearity for Attitudes (VIF = 2.463) and Health Awareness (VIF = 2.434), while Environmental Concerns shows the highest multicollinearity (VIF = 3.205), which may explain its non-significance in the model. Perceived Price, however, exhibits minimal correlation with other variables (VIF = 1.083). Although these VIF values are below the typical thresholds of concern (5 or 10), they highlight potential interactions among predictors. Practically, these findings suggest that marketing and policy initiatives should focus on changing consumer attitudes through education and positive messaging, as attitudes have the highest impact on organic food purchases. Additionally, emphasizing the health benefits of organic products can have a moderate influence, while addressing price concerns through subsidies, competitive pricing strategies, or communicating the value proposition can mitigate barriers to purchase decisions. The negative constant term ($\beta = -0.836$, p-value= 0.003) indicates a baseline tendency against organic food consumption when all predictors are at zero, underscoring the need for active interventions to promote organic food consumption in Tunisia.

Table 12: Estimated regression with purchase intention as the dependent variable

Predictors	Coefficients (β)	Std. Error	t-value	p-value	VIF	Priority
Attitudes (X_1)	**1.051**	0.073	14.382	0.000*	2.463	1st
Health Awareness (X_2)	0.265	0.094	2.808	0.005*	2.434	2nd
Perceived Price (X_3)	**-0.110**	0.044	-2.508	0.013**	1.083	3rd
Environmental Concerns (X_4)	0.067	0.098	1.218	0.224 (NS)	**3.205**	-
Constant	-0.836	0.277	-3.015	0.003*	-	-

*Significant at the 1% significance level. **Significant at the 5% significance level.
NS: Not significant

Comparing to a study conducted in Portugal at the same time (Santiago et al., 2024, 2025), both studies found Attitudes as the strongest predictor of organic food purchase intention, emphasizing the role of positive perceptions in driving consumer behavior. However, notable differences emerge between the findings. In their study, Environmental Concerns ranked as the second most influential factor ($\beta = 0.145$, p-value< 0.05), whereas here, it was excluded due to insignificance, suggesting that environmental motivations play a greater role among Portuguese consumers than Tunisian consumers. Health Awareness was significant in both studies, but its relative importance differed, being the second strongest predictor in this model, while in Santiago et al. (2024, 2025) study, it ranked third. Perceived Price also showed contrasting effects; while it had a negative influence in this study, indicating that higher prices discourage purchases, it was positively associated with purchase intention in the Portuguese study, implying that consumers in Portugal may view price as a quality indicator. Additionally, the model exhibited slightly stronger explanatory power ($R^2 = 0.654$) compared to Santiago et al. (2024, 2025)($R^2 = 0.579$), possibly due to regional differences in organic food perception and market conditions. These variations highlight the influence of cultural**,** economic**,** and market-specific factors on organic food purchasing behavior.

Conclusion

The determinants of organic food consumption in Tunisia are shaped by socio-demographic factors, economic limitations, consumer attitudes, product accessibility, and purchasing habits. Younger, more educated, and wealthier urban residents are more likely to consume organic food, while affordability is reduced by economic limitations, high unemployment rates, and larger household sizes. Higher prices remain the main purchase preventer, as organic products are perceived as expensive.

Consumer purchasing choices, organic food purchasing locations, and knowledge about organic food are key determinants of organic food consumption in Tunisia. Notably, 46.5% of respondents reported that they do not purchase any organic products, highlighting a huge portion of the population that either remains disengaged from organic consumption or faces limited access to organic options. This lack of engagement may also reflect insufficient availability of organic products. As a result, supermarkets and hypermarkets dominate organic food sales, while direct sales by farmers and organic food stores remain limited in the market. Moreover, over 60% of participants demonstrated limited knowledge regardingorganic food;this huge knowledge gap likely affects consumer attitudes and purchase intentions, acting as a major barrier to organic food adoption.

By studying what influences purchase intention, we can identify which factors play the most significant role in organic food consumption.The linear regression revealed that attitudes toward organic food arethe strongest predictor of purchase behavior, with a highly significant and positive effect. This indicates that consumers with more favorable attitudes are substantially more likely to intend to purchase organic products. Health awareness also emerged as a meaningful factor, though its impact is notably smaller, suggesting that health-conscious individuals are more likely to explore organic food choices. On the other hand, perceived price negatively affects purchase intention, confirming that higher prices continue to act as a barrier to organic food consumption. Notably, environmental concernshad no reliable connection withthe intention to buy organic food, reinforcing the idea that health and personal benefits carry more weight than environmental motivations. These findings highlight the importance of shaping positive consumer attitudes and addressingconcerns related to price in order to encourage organic food consumption

To increase organic food consumption in Tunisia, it is important to raise awareness through education so people understand its benefits. Making organic products more affordable, either through subsidies or better production methods can help more people buy them. Expanding where and how organic food is sold, along with offering a wider variety, will also encourage consumption. Highlighting the health benefits can make organic food more appealing. Additionally, creating a central marketplace for organic products and introducing simpler certification methods could make it easier for consumers to find and trust organic options.

While this study used a cross-sectional design to analyze the factors influencing organic food consumption at a specific moment in time, a longitudinal study could provide deeper insights by tracking possible changes in consumer behavior over time. A longitudinal study would help assess how awareness campaigns, pricing strategies, and policy interventions affects organic food consumption in the long term. It would also capture shifts in consumer attitudes, economic conditions, and market trends, offering a more dynamic understanding of the factors driving or hindering organic food adoption. Future research using this method could better evaluate effectiveness of strategies aimed at increasing organic food consumption in Tunisia.

Further research should examine how educational campaigns influence consumer decisions. It would also be valuable to explore how certification labels affect trust and whether increased availability in retail stores could lead to higher sales of organic food. As online shopping continues to expand, studying the impact of digital marketing and e-commerce on organic food purchases could provide useful insights.

References

Anderson, R., & Lee, K. (2019). *Organic farming and biodiversity: A systematic review. Journal of Environmental Management, 234*, 402-415.

AllAfrica. (2024, May 16). *Tunisia: Unemployment rate in the first quarter of 2024*:https://allafrica.com/stories/202405160573.html. Accessed on 27/03/2025

Artino, A. R., La Rochelle, J. S., Dezee, K. J., & Gehlbach, H. (2014). Developing questionnaires for educational research: AMEE Guide No. 87. *Medical Teacher, 36*(6), 463-474.

Babbie, E. R. (2020). *The practice of social research* (15th ed.). Cengage Learning.

Baranski, M., Srednicka-Tober, D., Volakakis, N., Seal, C., Sanderson, R., Stewart, G. B., Benbrook, C., Biavati, B., Markellou, E., Giotis, C., Gromadzka-Ostrowska, J., Rembiałkowska, E., Skwarło-Sońta, K., Tahvonen, R., Janovská, D., Niggli, U., Nicot, P., & Leifert, C. (2014). Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops: A systematic literature review and meta-analyses. *British Journal of Nutrition, 112*(5), 794-811.

Bartlett, M. S. (1950). Tests of significance in factor analysis. *British Journal of Psychology, 3*(2), 77-85.

Bazhan, M., Sabet, S., & Borumandnia, N. (2023). Factors influencing organic food purchase intention: A structural equation modeling approach. *Journal of Consumer Studies, 45*(3), 245-260.

Baudry, J., Assmann, K. E., Touvier, M., Allès, B., Seconda, L., Latino-Martel, P., Ezzedine, K., Galan, P., Hercberg, S., Lairon, D., & Kesse-Guyot, E. (2020). Association of frequency of organic food consumption with cancer risk. *JAMA Internal Medicine, 178*(12), 1597-1606.

Ben Kheder, M., & M'Hamdi, M. (2017). Organic farming and sustainable agriculture in Tunisia. *Mediterranean Journal of Biosciences, 2*(1), 36-45.

Ben Kheder, M., & Scialabba, N. (2020). *Organic agriculture in Tunisia: Challenges and opportunities*. Food and Agriculture Organization (FAO). Retrieved from https://www.fao.org. Accessed on 20/07/2024.

Bengtsson, J., Ahnström, J., & Weibull, A. C. (2005). The effects of organic agriculture on biodiversity and abundance: A meta-analysis. *Journal of Applied Ecology, 42*(2), 261-269.

Bornstein, M. H., Jager, J., & Putnick, D. L. (2013). Sampling in developmental science: Situations, shortcomings, solutions, and standards. *Developmental Review, 33*(4), 357-370.

Brown, T. A. (2020). *Confirmatory factor analysis for applied research* (2nd ed.). Guilford Press.

Calculator.net. (n.d.). *Sample size calculator*:https://www.calculator.net. Accessed on 28/10/2024.

CEPEX. (2023). *Tunisia's organic exports and international market integration*:http://www.cepex.nat.tn. Accessed on 20/07/2024.

Chen, M. F. (2007). Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality traits. *Food Quality and Preference, 18*(7), 1008-1021.

Codex Alimentarius. (2013). *Guidelines for the production, processing, labeling, and marketing of organically produced foods*. Food and Agriculture Organization & World Health Organization: http://www.fao.org/fao-who-codexalimentarius. Accessed on 03/08/2024.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Davis, K. (2022). Shifts in dietary choices: The rise of organic food consumption. *Journal of Nutrition and Food Studies, 14*(2), 123-134.

DeVellis, R. F. (2016). *Scale development: Theory and applications* (4th ed.). SAGE Publications.

Durham, C. A., & Mizik, T. (2021). Consumer perceptions of organic food attributes: A cross-country comparison. *Journal of Food Quality and Preference, 92*, 104205.

d-maps.com. (n.d.). *Tunisia map* [Map]: https://d-maps.com. Accessed on 21/08/2024.

El Bilali, H. (2019). Organic agriculture and the sustainable development goals. *Sustainability, 11*(15), 3962.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1-4.

European Commission. (2018). *Organic certification and regulations in the EU*: https://commission.europa.eu. Accessed on 12/07/2024.

European Commission. (2021). *Organic farming in the European Union: An overview*: https://commission.europa.eu. Accessed on 23/08/2024.

European Union. (2022). *Regulations on organic livestock and crop production*: https://eur-lex.europa.eu. Accessed on 12/08/2024.

FAO. (2020). *Organic agriculture: Opportunities and challenges in Tunisia*. https://www.fao.org/fileadmin/user_upload/faoweb/ffc/docs/Tunis_Factsheet_En_111223B.pdf. Accessed on 27/07/2024.

Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). SAGE Publications.

Food and Agriculture Organization (FAO). (2020). *Organic agriculture and food security*: https://www.fao.org. Accessed on 12/07/2024.

Gharbi, M., Mezghani, S., & Bouhlel, E. (2019). Organic food markets in Tunisia: Development and challenges. *Mediterranean Journal of Social Sciences, 10*(3), 120-135.

Gharnit, N., El Youssfi, L., Benmoussa, H., & Lamrani, B. (2020). The impact of organic farming on sustainable development in Morocco. *Journal of Sustainable Agriculture Research, 8*(3), 112-124.

Gracia, A., & de Magistris, T. (2008). The demand for organic foods in the South of Italy: A discrete choice model. *Food Policy, 33*(5), 386-396.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Pearson.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2020). *Multivariate data analysis* (8th ed.). Cengage Learning.

Harris, F., et al. (2020). The role of cultural heritage in shaping sustainable food consumption practices. *Sustainability, 12*(9), 3745.

Harrison, R., Newholm, T., & Shaw, D. (2005). *The ethical consumer*. Sage Publications.

Hovi, M., Sundrum, A., & Thamsborg, S. M. (2004). Animal health and welfare in organic livestock production in Europe: Current state and future challenges. *Livestock Production Science, 90*(1), 41-52.

Huang, C. L., et al. (2017). Urbanization, income growth, and the demand for organic food: Evidence from China. *Agribusiness, 33*(4), 606-620.

Institut National de la Statistique (INS). (2023). Tunisian population statistics : https://www.ins.tn. Accessed on 20/10/2024.

International Federation of Organic Agriculture Movements (IFOAM) – Organics International. (2022). Principles of organic agriculture:https://www.ifoam.bio. Accessed on 16/07/2024.

International Trade Centre (ITC). (2023). Tunisia's organic product competitiveness in international markets: https://www.intracen.org. Accessed on 18/07/2024.

Janssen, M., & Hamm, U. (2012). Product labelling in the market for organic food: Consumer preferences and willingness-to-pay for different organic certification logos. *Food Quality and Preference, 25*(1), 9-22.

Jin, H. J., & Kim, J. (2020). Accessibility and availability of organic food in urban markets: A comparative study. *Journal of Food Distribution Research, 51*(1), 101-114.

Johnson, R. A. (2021). *Applied multivariate statistical analysis* (7th ed.). Pearson.

Johnson, L. R., & Peters, K. T. (2018). The rise of organic foods: Impacts on health and the environment. *Journal of Sustainable Agriculture, 35*(4), 123-135.

Jones, S., & Taylor, R. (2018). The future of organic farming: Challenges and opportunities. *Agricultural Systems, 162*, 112-123.

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*(1), 31–36.

Kruskal, W. H., & Wallis, W. A. (1952). Use of ranks in one-criterion variance analysis. *Journal of the American Statistical Association, 47*(260), 583–621.

Lockie, S., Lyons, K., Lawrence, G., & Grice, J. (2002). Choosing organics: A path analysis of factors underlying the selection of organic food among Australian consumers. *Appetite, 39*(2), 113-124.

Magkos, F., Arvaniti, F., & Zampelas, A. (2021). Organic food: Buying more safety or just peace of mind? A critical review of the literature. *Critical Reviews in Food Science and Nutrition, 61*(1), 80-100.

Mann, H. B., & Whitney, D. R. (1947). On a test of whether one of two random variables is stochastically larger than the other. *The Annals of Mathematical Statistics, 18*(1), 50–60.

Massey, F. J., Jr. (1951). The Kolmogorov-Smirnov test for goodness of fit. *Journal of the American Statistical Association, 46*(253), 68–78.

McEachern, M. G., & McClean, P. (2002). Organic purchasing motivations and attitudes: Are they ethical? *International Journal of Consumer Studies, 26*(2), 85-92.

Merriam-Webster. (n.d.). Socio-demographic:https://www.merriam-webster.com. Accessed on 13/02/2025.

Ministère de l'Agriculture et de la Souveraineté Alimentaire. (n.d.). La certification en agriculture biologique [Logos] :https://agriculture.gouv.fr/la-certification-en-agriculture-biologique. Accessed on 19/08/2024.

Miller, R. (2021). Organic farming's role in soil health and biodiversity conservation. *Journal of Sustainable Agriculture Research, 10*(3), 45-58.

Miller, S. R., & Rucker, R. R. (2015). Sustainable agricultural practices and farm profitability: A panel data analysis. *Agricultural Economics, 46*(5), 643-656.

Miller, T. (2021). Organic food trends in the 21st century: A review. *International Journal of Agricultural Economics, 3*(2), 45-56.

Montgomery, D. C., Peck, E. A., & Vining, G. G. (2021). *Introduction to linear regression analysis* (6th ed.). Wiley.

Nefzaoui, A., & Cherni, J. (2021). Organic agriculture and sustainable development in Tunisia: Progress and challenges. *Journal of Agricultural Research and Development, 15*(2), 34-47.

Lee, H., & Park, S. (2019). Determinants of consumer decision-making for purchasing organic products: Insights from a meta-analysis. *Journal of Consumer Behaviour, 18*(5), 393–408.

Levene, H. (1960). Robust tests for equality of variances. In I. Olkin (Ed.), *Contributions to probability and statistics: Essays in honor of Harold Hotelling* (pp. 278–292). Stanford University Press.

ONAGRI. (2023). Organic agriculture statistics and reports: https://onagri.home.blog/2024/09/18/the-world-of-organic-agriculture. Accessed on 29/07/2024.

Pallant, J. (2020). *SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS* (7th ed.). Routledge.

Paull, J. (2021). *Organic agriculture in Tunisia, Africa.* European Journal of Agriculture and Food Sciences, 3(5), 1-7.

Paull, J. (2024). Organic agriculture in Tunisia, Africa. *European Journal of Agriculture and Food Sciences, 6*(1), 38-42.

Pimentel, D., Hepperly, P., Hanson, J., Douds, D., & Seidel, R. (2005). Environmental, energetic, and economic comparisons of organic and conventional farming systems. *Bioscience, 55*(7), 573-582.

Pino, G., Peluso, A. M., & Guido, G. (2012). Determinants of consumers' attitudes and purchase intentions with respect to organic food: A review and meta-analysis. *Journal of Consumer Marketing, 29*(2), 143-155.

Reganold, J. P., & Wachter, J. M. (2016). Organic agriculture in the twenty-first century. *Nature Plants, 2*, 15221.

Santiago, C. L. N., Fernandes, A. J. G., & Ribeiro, M. I. B. (2025). Determinants of the intention to purchase organic food products among Portuguese consumers. *Journal of Marketing Research and Case Studies, Vol. 2025,* Article ID 246894.

Santiago, C. L. N., Fernandes, A. J. G., & Ribeiro, M. I. B. (2024). Impact of sustainable consumer attitudes and behaviors on the intention to purchase organic products in Portugal: A survey study. *Proceedings of the 44th IBIMA Conference*, Granada, Spain, 27–28 November, 1947–1961.

Schäufele, I., & Hamm, U. (2017). Consumers' perceptions, preferences, and willingness-to-pay for organic certification logos: A choice experiment in Germany. *Food Quality and Preference, 63*, 200-208.

Seufert, V., Ramankutty, N., & Foley, J. A. (2012). Comparing the yields of organic and conventional agriculture. *Nature, 485*(7397), 229-232.

Shapiro, S. S., & Wilk, M. B. (1965). An analysis of variance test for normality (complete samples). *Biometrika, 52*(3–4), 591–611.

Shennan, C., Krupnik, T. J., Baird, G., Cohen, H., Forbush, K., Lovell, R. J., & Olimpi, E. M. (2017). Organic and conventional agriculture: A useful framing? *Annual Review of Environment and Resources, 42*(1), 317-346.

Smith, A., & Green, K. (2018). Cultural influences on organic food preferences: A cross-national study. *Journal of Consumer Marketing, 35*(3), 235-248.

Smith, J. (2020). *Sustainable farming practices: A global perspective.* Green Earth Publications.

Smith, L., et al. (2019). Organic food and health: A systematic review. *Nutrients, 11*(4), 674.

Smith-Spangler, C., Brandeau, M. L., Hunter, G. E., Bavinger, J. C., Pearson, M., Eschbach, P. J., ... & Bravata, D. M. (2012). Are organic foods safer or healthier than conventional alternatives? A systematic review. *Annals of Internal Medicine, 157*(5), 348-366.

Statista. (2023). *Education in Tunisia - Statistics & Facts*:https://www.statista.com/topics/8718/education-in-tunisia . Accessed on 27/03/2025

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53-55.

The Animal Welfare Foundation. (2020). Animal welfare in organic farming: Principles and practices: https://www.animalwelfarefoundation.org. Accessed on 22/08/2024.

Thøgersen, J. (2010). Country differences in sustainable consumption: The case of organic food. *Journal of Macromarketing, 30*(2), 171-185.

Trading Economics. (2023). *Tunisia School Enrollment Tertiary Percent Gross*:https://tradingeconomics.com/tunisia/school-enrollment-tertiary-percent-gross .Accessed on 27/03/2025

Tunisian Ministry of Agriculture. (2023). *Annual report on organic farming practices in Tunisia.* Tunis: Ministry of Agriculture Publications.

United States Department of Agriculture (USDA). (n.d.). *USDA organic logo [Logo]:* https://www.usda.gov/topics/organic. Accessed on 19/08/2024.

U.S. Department of Agriculture. (2013). *Organic livestock requirements:*https://www.ams.usda.gov/publications/content/organic-livestock-requirements. Accessed on 22/08/2024.

U.S. Department of Agriculture (USDA). (2023). *Organic certification and labeling standards:* https://www.ams.usda.gov. Accessed on 03/08/2024.

U.S. Food and Drug Administration (FDA). (2024). *Regulations on organic food labeling and safety:* https://www.fda.gov. Accessed on 24/08/2024.

U.S. Food and Drug Administration. (2024). *Agricultural biotechnology:* https://www.fda.gov/food/consumers/agricultural-biotechnology. Accessed on 16/08/2024.

World Health Organization (WHO). (2023). *Genetically modified organisms and food safety:* https://www.who.int. Accessed on 07/08/2024.

Appendix

Questionnaire: Organic Food Consumption in Tunisia

Consent Statement

By participating in this study, I understand that my participation is voluntary and confidential, as my responses will never be disclosed individually. They will be handled by specialists and presented only as part of the total sample, exclusively for educational purposes. I declare that I have read and understood the objectives and procedures of the study, and I give my consent for the processing of the collected data as defined.

☐ Yes

Socio-demographic Profile of the Respondent

Nationality:

☐ Tunisian ☐ Other

District of residence:

☐ Ariana ☐ Béja ☑ Ben Arous ☐ Bizerte

☐ Gabès ☐ Gafsa ☐ Jendouba ☐ Kairouan

☐ Kasserine ☐ Kebili ☐ Kef ☐ Mahdia

☐ Manouba ☐ Medenine ☐ Monastir ☐ Nabeul

☐ Sfax ☐ Sidi Bouzid ☐ Siliana ☐ Sousse

☐ Tataouine ☐ Tozeur ☐ Tunis ☐ Zaghouan

☐ Other: _____

Area of residence:

☐ Rural ☐ Urban

Gender:

☐ Male ☐ Female ☐ Other: _____

Age: _____

MaritalStatus:

☐ Single ☐ Married/Cohabiting

☐ Divorced/Separated ☐ Widowed

Educational qualifications:

☐ Primary ☐ Secondary ☐ High school

☐ BAC ☐ Higher education ☐ Other: _____

Net monthly household income(TND):

☐ < 2000 ☐ 2000 – 2500 ☐ 3000 – 3500

☐ 3500 – 4000 ☐ > 4000

Employment status:

☐ Employed ☐ Unemployed ☐ Student ☐ Retired

☐ Other: _____

Number of household members:

☐ 1 member ☐ 2 members ☐ 3 members

☐ 4 members ☐ More than 4 members

Number of children (under 18 years) in the household:

☐ None ☐ 1 child ☐ 2 children

☐ 3 children ☐ More than 3 children

II. Purchasing Behaviors of Organic Foods

Purchase of organic foods:

☐ I do not buy ☐ I buy once a year ☐ I buy once every 6 months

☐ I buy once a month ☐ I buy once a week ☐ Other: _____

Who makes the decision to buy organic foods:

☐ I do ☐ My partner ☐ Any family member ☐ Other: _____

Organic foods consumed most frequently: (Select all that apply)

☐ Medicinal and aromatic plants ☐ Fresh vegetables ☐ Fresh fruits

☐ Olive oil ☐ Dates ☐ Honey

☐ Jam ☐ Pastry and Flour ☐ None

☐ Other: _____

Place of purchase of organic foods: (Select all that apply)

☐ Directly from the farmer ☐ Local fairs or markets

☐ Supermarkets ☐ Organic product stores

☐ Hypermarkets ☐ Baskets delivered directly to home

☐ Online ☐ Other: _____

Determinants of Intention to Purchase Organic Foods and Knowledge about Organic Products

Indicate your level of agreement with each of the following statements:

1: Totally disagree; 2: disagree; 3: nor agree neither disagree; 4: agree; 5: Totally agree

	1	**2**	**3**	**4**	**5**
Buying organic foods is logical and wise	□	□	□	□	□
The quality of organic foods is better than non-organic foods	□	□	□	□	□
I trust organic food producers	□	□	□	□	□
I have no interest in buying organic foods	□	□	□	□	□
I trust the organic certification label and packaging	□	□	□	□	□
I am motivated to buy organic foods because of their beneficial properties	□	□	□	□	□
I do not trust the information on organic food labels	□	□	□	□	□
Many people important to me think I should buy organic foods	□	□	□	□	□
Many people important to me ask me to buy organic foods	□	□	□	□	□
People whose opinions I value prefer not to buy organic foods	□	□	□	□	□
Non-organic foods are as healthy as organic foods	□	□	□	□	□
Organic foods are natural, so they are better for my health	□	□	□	□	□
Organic foods are healthier because they do not contain hormones	□	□	□	□	□
Organic foods are healthier because they do not contain antibiotics	□	□	□	□	□
Organic foods are healthier because they do not contain toxic or chemical residues	□	□	□	□	□
I consider myself a health-conscious consumer	□	□	□	□	□
I carefully choose foods to ensure they are healthy	□	□	□	□	□
I often think about health-related issues	□	□	□	□	□

	1	2	3	4	5
Environmental balance is highly vulnerable and can be easily disturbed	□	□	□	□	□
Humans do not use the environment properly	□	□	□	□	□
Humans must maintain environmental balance to survive	□	□	□	□	□
Inadequate human interference in the environment can lead to catastrophic consequences	□	□	□	□	□
The environment should be protected through the use of ecological agricultural methods	□	□	□	□	□
Conventional food production does not harm the environment	□	□	□	□	□
Organic food production is better for the environment because pesticides and chemical fertilizers are not used or areused in smaller quantities	□	□	□	□	□
Organic food production is better for the environment because hormones are not used or are used in smaller quantities	□	□	□	□	□
Organic farming methods are better for the environment than conventional methods	□	□	□	□	□
Organic foods are available in sufficient quantities in the stores where I shop	□	□	□	□	□
I easily find organic foods in my neighborhood	□	□	□	□	□
If there are organic foods in the stores where I shop, I consider buying them	□	□	□	□	□
I intend to buy organic foods as long as they are more affordable in the market	□	□	□	□	□
The price of organic foods is very important to me	□	□	□	□	□
I often refuse to buy organic foods because I think they are expensive	□	□	□	□	□
It is important to me that the price of organic foods is similar to that of non-organic foods	□	□	□	□	□
I always try to find cheap food while shopping	□	□	□	□	□
I intend to buy organic foods as long as they are sold at lower prices	□	□	□	□	□
Organic food products have a pleasant taste	□	□	□	□	□
The appearance of organic foods is not appealing	□	□	□	□	□
Organic foods have a good and pleasant texture	□	□	□	□	□
The packaging of organic foods is not attractive	□	□	□	□	□

	1	2	3	4	5
I am willing to buy organic foods while shopping	□	□	□	□	□
I will make an effort to buy organic foods in the near future	□	□	□	□	□

From the following statements, indicate which ones are true or false:

	True	False	I don't know
Chemical fertilizers and pesticides are used to produce organic foods	□	□	□
Hormones are used in the production of organic foods	□	□	□
Genetic modification is used in the production of organic foods	□	□	□
Antibiotics are not used in the production of organic foods	□	□	□
The nutritional value of organic foods is higher than that of conventional foods	□	□	□
Organic foods do not contain preservatives	□	□	□
Human waste and animal manure are used in organic farming	□	□	□
It is difficult for me to know if foods are produced organically or not	□	□	□
Organic foods taste better than non-organic foods	□	□	□
Organic farming supports local small-scale farmers	□	□	□

Do you recognize the following symbol?

AGRICULTURE BIOLOGIQUE

☐ Yes ☐ No

Do you recognize the following symbol?

☐ Yes ☐ No