



## Analysis of Logistical Processes in Honey Export from Türkiye to Europe

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### ABSTRACT

The study examines the logistical challenges faced in exporting honey from Türkiye to Europe, emphasizing their significance for export performance and sectoral competitiveness. Although Türkiye benefits from a strategic geographical position and a developed land-sea transport network, several constraints continue to impede efficient market access. High transportation costs, prolonged certification and analysis procedures, and lengthy customs and border passage times collectively reduce operational efficiency and diminish firms' profitability. Using semi-structured in-depth interviews with 13 honey-exporting firms selected through convenience sampling, the research captures exporters' practical experiences and identifies the critical pain points in the logistics chain. Findings indicate that maritime and multimodal transport are the predominant shipping methods, with glass jars preferred for their market appeal, while cold chain applications remain limited and are used only in exceptional circumstances. The most critical bottlenecks involve extended certification processes and waiting times at customs, both of which significantly increase costs and delay deliveries. Based on these insights, the study highlights the need for digitalization initiatives, targeted investments in logistical infrastructure, and streamlined certification procedures to enhance the efficiency of honey exports to Europe. Implementing such improvements is expected to reduce costs, accelerate processes, and strengthen the competitiveness of Türkiye's honey sector in European markets.

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## Introduction

Türkiye has immense potential for apiary with its varied climate, lush vegetation, and abundant bee resources. The breeding of bees is practiced on a commercial scale in almost all parts of the country, from conventional to organic farming practices. Honey production in Türkiye is initiated with the citrus flow in the Mediterranean part of the country, while in the Black Sea, Marmara, Anatolia, Aegean, and Mediterranean areas, production is done by mono- or polyfloral honeys, followed by the production of pine honey in the Aegean and Mediterranean areas of the country (Akdeniz & Kantar, 2022). The geographical location of Türkiye is favorable in two ways, acting both as the apiary hub of the world and the entry point for the European markets. Innovation in the supply chain is extremely necessary here, improving the efficiency of logistics, thereby countering the effect of environmental changes that could hamper the dynamics of exportation (Al-Khatib, 2023).

Türkiye comes in the third rank globally, following that of China, in the number of beehives, while coming second in the total production of honey, according to Kadiroğlu,

2024. But the ratio of the total honey exported compared to the total production is remarkably small, according to Tepge, 2024, pointing to the fact that the country is yet to exploit the current production potential fully. Among the reasons why the country is facing the current dilemma is the fact that the supply chain is facing challenges, especially with the European markets, which are highly reliant on imported products due to its lack of production, creating an important export potential target for the high-quality natural honey from Türkiye, who also has the highest demand for quality honey, according to Pippinato, et al., 2019. Yet, due to the poor logistics system, lack of transportation, lack of storage, or the delay in the time of delivery, the current opportunity is yet to be fully explored. Also, with the continuously stricter regulations by the European Union, also known as the EU, the current burden on the Türkiye honey is exponentially increased, thanks to the need to be traceable from production until the delivered product reaches its destination, while only shipping from accredited firms, according to Daleth Group, 2024.

There are different studies conducted over the years that have pointed to the strategic role of supply chain management practices in the agricultural sector. Strategic alignment with the supply chain management practices can bring about innovation, hence making the agricultural firms more competitive in the markets (Storer et al., 2014). However, with relation to the foregoing, it is important to acknowledge that the Türkiye honey industrial sector can also gain immensely from the adoption of sustainable practices that are aimed at making the supply chain agile (Figueirêdo et al., 2016). Therefore, it is recommended that companies use agile data gathering techniques and online platforms to better track product origin, quality, and other stakeholders in order to establish resilient supply chains. This enables rapid response to disruptions and sustainable growth through revitalizing supply chain risk management initiatives (Syed, 2023).

The structure of the paper will be as follows: The first section presents the introduction and background of the study. The second section provides a comprehensive review of the relevant literature on logistics and supply chain management practices in the export of agricultural products. The third section outlines the proposed methodology. The fourth section reports and discusses the empirical findings. The final section offers the conclusions, theoretical and managerial implications, and recommendations for future research.

## Literature Review

The honey sector represents one of the vital components of the agricultural production of Türkiye, with the export potential being determined on the basis of the cultural, environmental, and biological aspects of the country itself. The exportation of honey from Türkiye to Europe is one of the crucial points that bring agricultural production, economic policies, and other aspects on the global platform, with consideration being given to the increased rate of growth of globalization, requiring appropriate supervision of the activities of bees to ensure the sustainability of the health of the honey bees, along with the production level. The genetic diversity of the honey bees within the country is dependent on the environment, creating the conditions to be reflected in the logistics policies due to the rapid rate of growth of globalization. Comparatively quick technological and structural developments in the world of global trading are forcing nations and companies to integrate more and re-balance competitive forces. Logistics activities have surfaced in this context as a determining factor for export firms to develop comparative advantages and achieve long-term prosperity. This is to say that logistics activities are capable of accelerating growth in honey exports and placing Turkish honey competitively in the European market.

Coordination between producers, logistics companies, and authorities of honey exports is considered a main driver to enhance the performance of food enterprises. Such cooperation enables working procedures in the complicated context of international trade; it also gives companies advantages based on differentiation and compliance with regulations within the competitive EU markets (El-Sahli 2025; Karipidis et al., 2020). Turkish

honey exports to Europe can be examined by various logistics concepts and mechanisms of a supply chain. Application of maritime logistics within agricultural exportation is confirmed by research noticing that political support and simplification of administrative procedures play a significant role in enhancing the export performance of the agricultural sector (Sagareishvili, 2021). The high demand for quality honey in the EU inspires consumers to pay more for goods of a specific quality and origin.

This situation reinforces the competition between honey exporting countries like Mexico, China, and Türkiye and the general competitive capability of Türkiye in the EU market (Çevrimli et al., 2020). In addition, customs policy and trade relations with Türkiye by the EU have a direct influence on logistics conditions for honey exportation. While Türkiye-EU Customs Union provides a substantial framework for trade facilitation, tariff regimes, access to markets, and efficiency in customs procedures have a direct influence on export levels. This is another dimension that underlines at minimum bureaucratic obstacles that may detract from trade and efficient customs procedures (Larch et al., 2020; Yücel, 2014).

However, quality focus creates pressure on the quality management process in the supply chain to be strict in order to follow the EU rules and the expectations of the consumers at the highest levels (Nguyen et al., 2021). The growth of e-commerce over the last years has brought innovative logistics solutions into the focus in honey supply chains. More specifically, the application of the latest technology, such as blockchain, provides efficient supply chain management with the advantages of traceability and transparency (Aydoğan and Aydemir, 2022; Yao and Zhang, 2022). Apart from having the capability to remove the logistical barriers, these solutions have the potential to attract the attention of the consumers who are concerned about sustainability and food safety (Jin, 2024). In other words, the application of solutions with these characteristics for the processes of the supply chains and logistics has currently become an activity with strategic imperatives for Turkish honey exporters who intend to increase their competitive advantage in the EU markets. The physicochemical properties/characteristics of the honey are grounded on the honey studies conducted in Türkiye (Bayram et al., 2019; Kıvrak et al., 2016). Although the quality of the products is good, just being good is not sufficient, but there must be also an efficient system of logistics with processes including order, transport, or inventory management practices required during the time of export (Arifin et al., 2022).

To prevent delays in honey exports, internationally standardized supply chain processes must be established, ensuring that products are transported under optimal conditions and maintain the required quality levels throughout the export journey. Traceability is also essential, as it guarantees the verification of product quality from production to final consumption. In this context, incorporating appropriate protection measures—such as temperature control or other product-specific preservation techniques—into logistics operations is particularly critical for perishable goods. These measures help safeguard the physical integrity, stability, and marketability of honey during storage, handling, and cross-border transport.

There must be well-organized international standard supply chain processes so that there are no delay problems, and the honey products are exported under optimal conditions. The traceability process in the current context is of immense importance in relation to the documentation process with respect to the origin or quality aspects of the products supplied or traded across the international borders. The application of protection or temperature control processes, especially within the context of perishable products like honey, into the logistics process is an important requirement in the current context (Ivanova, 2022). In a nutshell, the dynamic interaction process between the quality aspects of honey, the logistics process, the international trade process, and the innovative aspects of the supply chain process reveal the complexity involved in the current context of honey exportation from Türkiye to the European markets.

## Conceptual Framework

### *Logistics Performance and Export Competitiveness: A Resource-Based and Value Chain Perspective*

The possible benefits of upgrading the competitiveness of the country's export commodities with improved logistics performance can be described from three different outlooks or considerations: Resource-Based View, the Global Value Chain, or the Logistic Performance Index. The Resource-Based View argues that one of the resources created by firms, which can provide sustained competitiveness, is those firms' logistics capabilities or abilities. When the efficiency of the transport, storage, or customs processing aspects of these exporter firms is maximized, the firm is creating its own unique advantages in areas that are related to the reduction of costs and flexibility in the global marketplace (Çakır et al., 2022).

A GVC outlook on the matter indicates that logistics capabilities are crucial in defining the degree of integration or positioning of the firm in the global value chain network. Improved logistics coordination also translates to enhanced product movement/flow, which is necessary for time-market lead time, an important factor in the competitiveness of the agri-food chain, supported by the work of Trivellas et al. (2020).

In complement to these theories, the LPI provides measurable variables, such as customs efficiency, quality of infrastructure, or services reliability, that explain differences in export outcomes (Ding et al., 2022; Tseng & Liao, 2015). Nations and corporations that focus on logistics efficiency are able to realize cost-effectiveness, reliability, and time velocity, thereby having greater outcomes in their export activities. In sum, logistics efficiency is an important enabling factor that bridges firm capabilities with the efficiency of national trade, or plays a vital part in improving export competitiveness in the agri-food sector.

### *Trade Facilitation and Institutional Constraints in Export Logistics*

The result is that trade facilitation is in an institutional relation with the challenges entailed by the inefficiency of the customs process that affects the export logistics and performance. The Theory on Trade Facilitation is supported, among other reasons, by the consideration that

in international trade, time and cost are highly diminished with the simplification of international trade procedures.

Consequently, the efficiency of the customs process, like that facilitated by the WTO's TFA, is one that is without uncertainties, while inefficiency can be described or characterized as "time-based trade barriers," one that inhibits or is an impediment to the completion of the competitors, according to Portugal-Pérez & Wilson (2012) and Oberhofer et al. (2021). "Documentation, checks, and charges raise the cost of logistics" and inhibit "market diversification," according to Dennis & Shepherd (2011).

Under the Institutional Theory, having good-quality mechanisms of governance or legislation is vital in defining the efficiency of trade facilitation policies. The lack of bureaucratic complexity, corruption, or complex legislation in countries with good intra-institutional practices leads to smoother logistics chains, while countries with poor practices, corruption, or bureaucratic complexity delay certification processes among other challenges (Kumari & Bharti, 2021; Jones, 2024). The exporting firms will be required to adapt to the required changes within their strategies for efficiency.

TCE also further adds to these theoretical viewpoints in analyzing the manner in which high levels of procedural and compliance costs shape the supply chain behavior of firms. The exporters could opt for more costly but assured logistics or abandon the risky markets completely (Carballo et al., 2023; Yu et al., 2024). Altogether, the entire gamut of these theoretical viewpoints clearly implies that an efficient trade facilitation system with a favorable environment is regarded as an extremely vital factor influencing the behavior of exports, particularly in the highly regulated European Union markets.

### *Strategic Adaptation and Dynamic Capabilities in Export Logistics*

Within the rapidly changing context of international trade, there are persistent challenges facing the exporter, including certification, transportation, or supply chain challenges. Firms, therefore, need to develop dynamic capabilities so that they are able to sense, adapt to, and reconfigure their activities in response to the changed context. By applying the Dynamic Capabilities Theory and the Contingency Theory, the importance of the impact of digitalization, process innovation, or organizational learning on the adaptability of firms with respect to export logistics is explained.

The process of digitalization of the supply chain improves the level of efficiency due to enhanced levels of clarity or the way information moves. There is enhanced flexibility in the organization that can tackle uncertainties, apart from other forces created due to transport service changes, because of the application of technology, according to Zouari et al. (2020) and Yin & Ran, (2022).

Process innovation is another crucial element of adaptability, as it helps exporters to reinvent logistics processes, minimize administrative bottlenecks, and improve certification procedures. By logistics mapping, innovation, and technology processes, there will be minimization of transactional costs, along with increased adaptability to the needs of the markets (Liu et al., 2022; Pudeyan et al., 2023).

## Materials and Methods

### *Purpose and Research Questions*

The primary focus of the proposed study is the comprehensive identification of the problems encountered by the Turkish firms in their logistics processes of honey exportation to Europe, as well as the effect of these problems on their strategies, investment, and practices in the process of exportation. The proposed study has been designed based on four main study questions to explore the challenges, problems, or expectations of solutions in the logistics process of the sector.

- The study seeks to establish the challenges involved in other processes, including transportation, customs clearance, paperwork, insurance, warehousing, and the distribution process. The importance of effective solution strategies cannot be overemphasized, according to the complexity involved, risks, and challenges inherent in the logistics process across current supply chains, especially cross-border transportation, according to Christopher (2016).
- Second, the current study analyzes how the impacts of logistics on firms' long-term strategies regarding investment in export markets are realized. Factors connected with high logistics costs, freight uncertainties, or challenges entailing product quality may immediately contribute to the investment decisions of firms on entry or expansion in different markets. Bowersox & Closs stated, "Logistics is an inherent part of the firm's strategy, with the outcomes of logistics influencing, for example, market share, profitability, or both."
- Thirdly, the study will be able to determine the solutions developed by honey exporters to tackle these challenges. The solutions developed by these businesses will include strategies involving growth in the amount of honey stored, exploring transport solutions, or technology solutions. According to Lieb & Bentz, innovation and adaptability in managing the supply chain are crucial in succeeding in the globalized marketplace.
- Moreover, the study also examines the expectations of the logistics providers, along with other associations, on how to resolve logistics problems. According to the viewpoints provided by Rodrigue & Notteboom in the year 2010, the application of policies, along with the involvement of various other sectors, is extremely crucial for achieving optimal supply chain efficiency.

### *Method and Data*

In the current study, the applied method is qualitative with the focus on defining the challenges faced by the honey exportation firms from the logistics side. The main target of the qualitative study is the interpretation of the phenomenon under investigation (Altunışık et al., 2010).

In the context described, the intensive interview method was applied with the aim of gathering data for the study. A semi-structured format for the interview was developed, consisting of open-ended and closed-ended questions, with the intention of gathering comprehensive data from the interviewees. The interview process was conducted with the help of the standardized question

format, with extra questions in between if required, to focus on the topic of the interview, with flexibility in the question format, allowing the interviewees to freely state their experiences on the topic, without restrictions or preparations before the interview process, just as described by Altunay et al.

Participants were selected using the convenience sampling procedure, with voluntary participation being the norm. The convenience sampling procedure is selecting the study participants from the study population according to their accessibility, geographical location, availability, and the study interest or willingness to engage in the study (Bilici, 2024). The procedure is largely ideal for social sciences studies, considering the cost-effectiveness involved, especially in scarce resource settings. In this context, 13 companies were selected based on accessibility and voluntary participation rather than export capacity, business size, or production volume. Each company was actively engaged in honey exports to Europe, ensuring a diverse representation of operational structures and professional roles (such as export managers, food engineers, traders, and beekeepers) within the sector.

There are differing opinions in the literature regarding the minimum sample size for in-depth interviews. Yıldırım and Şimşek (2016) note that a single participant may be sufficient, whereas Adams (2015) recommends at least ten participants, Galvin (2015) suggests twelve, and Litfin (2017) conducted fourteen interviews for the research section of his book *Eco Villages*.

### *Trustworthiness, Coding Procedure, and Saturation*

"We ensured qualitative rigor through complementary strategies covering credibility, dependability, confirmability, and transferability. First, we developed an initial codebook deductively from the research questions and the logistics literature, then refined it inductively after the first [3] transcripts. Two researchers independently coded an overlapping subset of interviews ([n]=4) and discussed discrepancies until consensus; intercoder agreement was tracked through structured comparison tables and memoed resolution notes (no numerical  $\kappa$  is reported as the emphasis was on negotiated agreement).

Instead of using specialized qualitative software, all coding was organized through a matrix-based manual system: transcripts were segmented into meaning units, transferred to a structured Excel coding grid (rows = text segments, columns = codes/themes), and cross-referenced with an evolving codebook to maintain a transparent and auditable trail. Triangulation was pursued by contrasting narratives across roles (e.g., engineers vs. export managers) and transport modes (sea vs. road). Member checks were conducted informally by sharing synthesized theme statements with [2–3] selected participants for plausibility feedback. Thematic saturation was monitored continuously; no substantively new codes emerged after the [11]th interview, and the final two interviews confirmed existing categories. To facilitate transferability, we provide thick description of context and participants below."

### *Participant Distribution (Geography & Firm Size)*

The 13 interviewees were all exporters operating within the Black Sea production–logistics corridor, which

represents Türkiye's most concentrated honey-processing and export geography. All participating firms were based in key Black Sea provinces that serve as the region's primary consolidation, storage, and port-access hubs. Regarding the firm size definition according to the EU SME definition, [a] are micro/small exporters with fewer than 50 employees, [b] are medium-scale businesses with 50 to 249 employees, while [c] are large businesses with over 250 employees. The relatively homogenous geographical focus, depending on firm size, reflects the differences in the capabilities of these actors in the value chain, specifically the honey export value chain from the Black Sea, with regards to their logistics capabilities, certification experiences, or transport mode preference.

## Results

### *General Information about the Interviewed Companies*

The table gives the frequency distribution of the demographics of the study participants in relation to their educational level, occupation, and levels of income. In relation to the gender distribution, the majority are male study participants (76.92%), while the rest are female study participants (23.08%). The majority, who are married, are 84.62%, while those who are single are 15.38% of the study population. In relation to the age group, the 26-35 years and 36-45 years are also received 30.77% each, while the 46-55 years are 23.08% and the 56-65 years also are 15.38% of the study population.

Analyzing the educational qualifications, the highest percentage was observed in those with baccalaureates (61.54%), followed by those with postgraduate degrees (23.08%), while those with secondary school education

made up 15.38% of the study. Regarding the sector-wise occupation, the highest percentage was observed in food engineers with 30.78%, followed by others who are beekeepers, agricultural engineers, and customs consultants with 7.69% each, while those engaged in trade, including export managers, foreign trade managers, merchants/traders, made up 15.38% of the study. All the study participants are professionals who work with different firms that are actively engaged in the exportation of honey from Türkiye to European countries, including positions such as Beekeeper, Food Engineer, Agricultural Engineer, Export Manager, Merchant/Trader, Foreign Trade Manager, or Customs Consultant.

Regarding the income levels, the greater percentage of the study's participants (69.23%) had an income of 100,001 TL or more, while those with incomes ranging from 80,001 to 100,000 TL, 50,001 to 80,000 TL, and 30,001 to 50,000 TL contributed 15.38%, 7.69%, and 7.69%, respectively, to the study.

This distribution, on the whole, shows that the sample is dominated by male, married, and university-educated respondents who are mostly middle-aged technical, engineering, and trade professionals working in honey-exporting firms earning relatively high incomes.

There is clear indication from Figure 1 that honey is exported to Europe but mostly to particular markets. Germany is the main destination, taking about one-third of all the honey exported, making the country the most important target market.

The reason why the biggest target market is located in Germany is because of the high demand for honey from Türkiye, apart from the influence of the Turkish community in the country on the consumption pattern of the product.

Table 1. Descriptive statistics of the participants

Variable		N	%
Gender	Male	10	76.92
	Female	3	23.08
Marital Status	Married	11	84.62
	Single	2	15.38
Age	26-35	4	30.77
	36-45	4	30.77
	46-55	3	23.08
	56-65	2	15.38
Education	Secondary School	2	15.38
	Undergraduate	8	61.54
	Postgraduate	3	23.08
Occupation	Beekeeper	1	7.69
	Food Engineer	4	30.78
	Agricultural Engineer	1	7.69
	Export Manager	2	15.38
	Merchant / Trader	2	15.38
	Foreign Trade Manager	2	15.38
	Customs Consultant	1	7.69
Income (TRY)	30.001 TL - 50.000 TL	1	7.69
	50.001 TL - 80.000 TL	1	7.69
	80.001 - 100.000 TL	2	15.38
	100.001 TL and above	9	69.23
Total		13	100.00

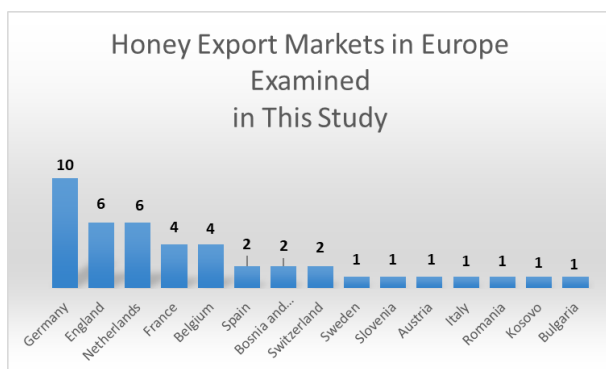


Figure 1. Which countries in Europe do you export to?

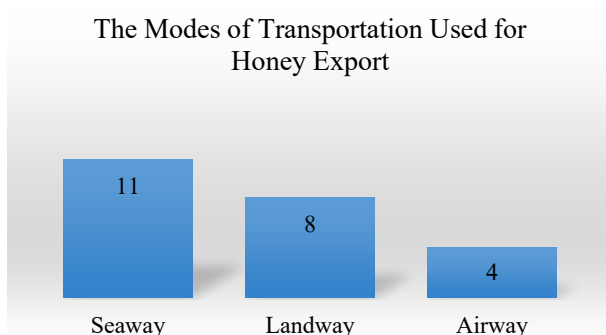


Figure 2. Which modes of transportation do you use for honey export?



Figure 3. What kind of packaging do you usually use to export your products?

### Findings Regarding Honey Export Logistic Activities and Transportation

The United Kingdom and the Netherlands rank second and third with high shares, respectively. These countries are markets with strong intra-EU logistics connections and well-developed port and distribution infrastructure. These characteristics make these countries strategic hubs for the intra-European redistribution of honey. France and Belgium have moderate shares and are distinguished by their proximity to neighboring countries and the diversity of demand for food products.

Other countries (Spain, Switzerland, Bosnia and Herzegovina, Sweden, Slovenia, Austria, Italy, Romania, Kosovo, Bulgaria) are represented at low rates. The low market share of these markets suggests that exports to these countries generally develop on an order-based, small-scale, or opportunity-driven basis.

Overall, the table shows that exports are concentrated in Western and Central Europe, while Eastern European and Scandinavian markets have not yet been sufficiently tapped. This situation indicates the need to develop strategies targeting countries with low shares in order to maintain the current market share, reduce risks, and increase market diversity.

Figure 2 shows that sea transport is the most commonly preferred mode of transport for honey exports, with the vast majority of participants using this method. The prominence of sea transport can be explained by its ability to transport high-volume cargo cost-effectively over long distances and the advantages it offers in terms of access to European ports. Road transport, on the other hand, is generally used in conjunction with sea transport, particularly for short and medium-distance shipments between ports and final destinations.

Air transport, even if used less often, is also an effective mode of transport for valuable or urgent orders. The less usage, however, can be justified by the high service charges involved, apart from the fact that the product is non-perishable. The total scenario implies that the multimodal transport service, whether sea & road or sea & air, is largely practiced for the transportation of honey exports, with the logistics process optimized depending on the geographical positioning of the market.

According to figure 3, glass jars are the most commonly used type of packaging for honey exports, appearing at the highest frequency either alone or in combination with other types of packaging. This situation can be attributed to the suitability of glass jars for direct sales to consumers, as well as their ability to enhance the visual presentation and perceived quality of the product.

The second type is combinations that feature glass jars packed alongside tin or bulk drums. This type of packing is generally favored for bulk orders or industrial purchases. Other forms, including plastic or wood, are used much less often, usually favored in other marketing plans or special orders.

In sum, the available data highlights the fact that the prominent role played by the glass package in the exportation of honey is also complemented by other package varieties according to the demand pattern of the target market or the attributes of the buyer profile. This diversity demonstrates that exporters can flexibly adapt to both retail and wholesale market segments.

Figure 4 shows that the vast majority of participants do not consider the use of a cold chain necessary for the transportation of honey. However, three participants stated in their detailed responses that, although a cold chain is not generally required, they use climate-controlled containers to prevent crystallization in extremely low temperatures during the winter months.

This approach indicates that under normal conditions, there is no need for a cold chain due to the physical properties of honey and the low risk of spoilage, but in special cases where temperature fluctuations can affect the physical form of the product (particularly crystallization), controlled transportation is employed. Therefore, it can be said that logistics strategies involve flexible transportation planning that is sensitive to climate and seasonal conditions, and that this planning is considered a preventive measure to protect product quality.

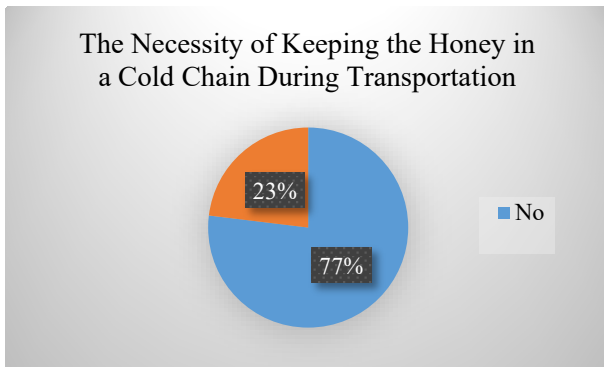


Figure 4. Do you find it necessary to keep the honey in a cold chain during transportation?

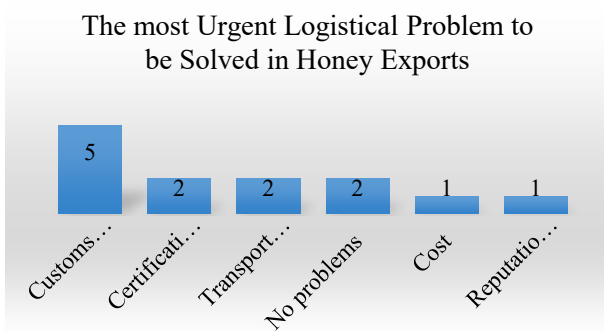


Figure 5. What are the main logistical problems you encounter and what is the most urgent logistical problem that needs to be solved in honey exports?

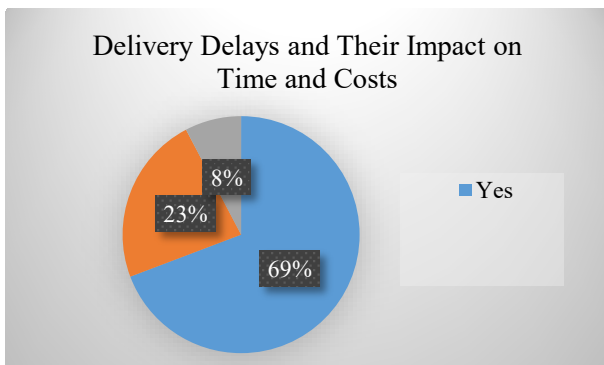


Figure 6. Are there delays in your export deliveries due to disruptions in logistics processes (such as waiting at border crossings)? If so, how do these delays affect your delivery times and costs?

An examination of Chart 5 reveals that participant responses clearly demonstrate that the most urgent logistical issues in honey exports require reducing waiting times at customs and border gates and expediting certification processes. The long process of examinations conducted at land border customs, the existence of discretionary practices carried out in border gates, the issue of procedural delay, especially in Bulgaria, contribute largely to the extended time period for the entire process, hence the cost of exportation. Waiting time, in the case of part shipment, also stands out as another important factor inhibiting the efficiency of the entire logistics process. Regarding certification, firms internally emphasize the simplification of the TAREKS system for small consignments, accelerated approval of documents via the online system, or the

reduction of unnecessary bureaucratic steps. They also include the exemption from operational barriers particular to transport sectors, which are also regarded highly as another important need. The solutions provided by the firms are the augmentation of flight frequency for air transport, exemption from jurisdictional transportation for shipping by sea, the simplification of accessible equipment, especially for 20-foot containers, especially in peak periods, or the augmentation of the number of firms exercising control over home-delivered logistics, amongst others. There are also other challenges, including lack of documents required for clearance from the border, discrepancies in the outcome of the products, hence leading to the delay of products for days or even requiring them to be shipped back, hence inhibiting the process of export with adverse consequences on export efficiency and cost-effectiveness. They, however, reported no significant problems in the entire process.

The questionnaires show that the disruption of the logistics procedures is caused mostly by road transport. The Bulgarian border has also been pointed out by many questioners as the most problematic point, with the delay, random checks, or long processing time there causing longer transport time and extra costs. Some questioners also pointed out that sometimes problems are encountered at the customs of Istanbul.

The consequences of these are longer transport time, extra cost incurred by the transport firm, and extra warehouse cost involved in air transport. It is noted that sometimes these extra charges are incurred by the exporter, while other times the charges are incurred by the client, hence creating complications in the business transaction. In particular, some interviewees reported that the honey products are always classified in the red category on the border, yet with the whole analysis completed, there is rerouting, which affects the process.

However, some firms reported that these challenges are not faced while shipping via the ship transport mode, as there is smooth flow because the firms are experts in the process, and the product has already undergone analysis. This clearly shows how the transport mode affects the time taken for the product delivery process. Some firms, on the other hand, reported that these challenges are now “commonplace” because the firms already factor these challenges into their planning process. Some firms responded with a clear “no, it doesn’t happen” because those firms have never encountered these challenges before.

In general, the data indicates that the mode with the highest risks and likelihood of delay is the road transport mode in the export of honey to Europe, while sea transport is the mode with the least risks, meaning the mode with the highest stability in the transport service process.

#### **Findings Regarding Honey Export Customs, Certification and Regulatory Compliance**

As illustrated in Chart 7, the quality control or certification steps to be followed for the exportation of honey to Europe represent an important barrier for firms, mostly because of the time taken to conduct the analysis steps, which are relatively long. Some firms reported taking one week to 10 days to process the analysis, but if there are problems with the device or certification checking, the total procedure can last for up to two months. Although the certification steps are unique to the UK,

Germany, or other countries, there are firms complaining about the lack of analysis facilities in Türkiye, the small number of facilities equipped with the capability to conduct the necessary analysis, or the employees' unfamiliarity with the required documentation process.

Some of the participants also pointed out that there are extra requirements that must be met by European exports over other countries, particularly the analysis of lead, but that the process is not problematic if carried out quickly. However, the requirement to provide TAREKS and the veterinary health certificates was seen to be time-consuming and costly, especially for small consignments for export. Firms who have to conduct these analyses abroad, for instance the laboratories QSI and INTERTEK, stress how these are both costly and time-consuming, with the process of making the declaration even more problematic if the samples are sent out.

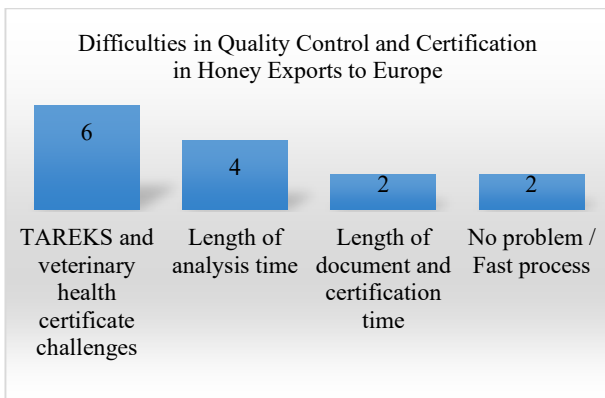


Figure 7. Do you encounter difficulties in procedures regarding quality control and certification of products when exporting honey to Europe?

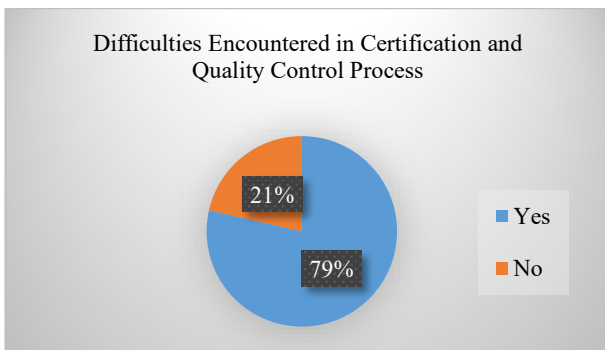


Figure 8. Difficulties Encountered in Certification and Quality Control Processes



Figure 9. Have you complied with the EU's "EU registered business" requirement (EU 2023/2652)?

Some of the exporters revealed that there is also the consideration that honey is inspected with lower priority in Türkiye. Although the analysis or certification process for the export of fruits or vegetables may be conducted within one day, the process will take two weeks if the product is honey, affecting the time of delivery or delivery plan. Some exporters reported having fewer problems in the process of exporting their products to Europe, or the process was smooth because fewer additional analyses were required.

In conclusion, the implication of the results is that the testing procedure for honey exported to Europe is currently a big constraint in terms of time and cost for the companies involved. The solution lies in improving the analysis facilities, developing more portals, simplifying the process, or having lenient rules for small consignments.

The data obtained reveals that the vast majority of participants (84.6%) experience difficulties in quality control, certification, and analysis processes in honey exports to the EU. Upon examination of the responses, three main factors emerge as the root causes of the problems: the length of the processes, the cost burden, and institutional malfunctions. It has been noted that the completion of analysis and certification procedures takes at least one week, and in some cases, the process can extend up to two months due to issues such as analysis equipment malfunctions, certification approval delays, and bureaucratic procedures. Countries like the UK and Germany, in particular, apply stricter procedures for certification and analysis requests, further complicating the process.

Participants emphasized that honey is considered a "secondary" product in export procedures compared to other agricultural products, noting that while procedures including analysis can be completed in one day for fresh fruit and vegetable exports, the process for honey takes approximately two weeks. Additionally, the TAREKS requirement and the veterinary health certificate process for animal products create additional pressure on exporters in terms of both time and administrative burden. Some participants noted that analyses not conducted in Türkiye are sent to laboratories abroad (e.g., QSI, INTERTEK), but the requirement to open a declaration for this process is unsustainable and increases costs.

However, despite the current regulatory requirements not being overly burdensome, it has been noted that officials' lack of knowledge and indifference to the process lead to additional delays, with new documents needing to be prepared even after the goods have arrived at customs. In conclusion, it is assessed that there is a need to improve the quality control and certification process in honey exports at both the structural and operational levels; increasing analysis capacity, digitizing processes, improving the technical knowledge level of relevant institutions, and revisiting product-based prioritization policies will enhance the sector's competitiveness.

The fact that all the players responded "yes" in fig 9 indicates that the firms engaged in the exportation of honey from Türkiye to the EU have taken proactive steps to be in line with the rules and legislation, with the main requirement of "being registered with the EU" fulfilled, as required by EU Regulation 2023/2652. The current state clearly indicates that the firms took the necessary steps in accordance with the rules of the EU market, which is of immense importance to them.

Moreover, the observation that all firms are in compliance with the legislation indicates that the awareness level with respect to the legislation appears to be high, with good information flow, and the channels of communication between the government and the exporters are also good. This is an important factor lending itself to the reduction of possible barriers to trade between Türkiye and the EU, while at the same time helping the Turkish honey exporters to retain their international competitiveness.

**Findings Regarding Honey Export Cost, Strategy and Technology Use**

Based on the data presented in figure 10, logistics costs (transportation charges, fuel charges, storage, customs charges, etc.) also play an important role in the profitability of honey exportation activities. The greater number of responses from the concerned stakeholders was “affects” or “affects greatly” compared to the “does not affect” category, which was relatively lower with only a few stakeholders falling into that category. This current state indicates that the importance of logistics cost is not only confined to its operational aspects but also to the strategic aspects of the concerned firms in the industry. The fact that some stakeholders responded with “very much” indicates that the concerned cost is largely compressing the profitability margins, possibly even threatening the competitive advantage levels for some firms. Although the exportation of honey falls within the category of high value-added products, there is an understanding that the concerned pressure due to cost, linked to the current logistics practices, is currently constraining the same favorable treatment. Furthermore, the levels of current transportation charges, fuel charges, or possibly customs charges have largely emerged or are likely to be key drivers influencing the current strategies adopted by the firms for their export programs.

According to figure 11, the responses show that there are impacts on the long-term strategies of honey exporters due to the problems in the logistics process, both direct and indirect. Some honey exporter companies reported problems in securing transporters to conduct part of the shipment due to the high cost of logistics certification, leading to the cancellation of orders. Notably, the high cost per unit compared to the product price has made the companies cancel markets or focus on niche markets that require high-quality products because of their high expectations from the product quality, hence offering the exporters high profits due to the niche markets’ high price due to their lack due to the product quality. Some have delayed entry into the European markets due to these reasons, hence seeking other markets like the Middle East markets instead. Some of the honey exporter businesses argued that these problems have had no effect on their long-term strategies, hence able to conduct the process with help from more professional logistics companies.

Looking at figure 12, the solutions developed by the participants to handle the problems faced in the logistics process are diverse in both operational innovation and adaptation strategies with existing constraints. Some firms have clearly stated that their success in maintaining the integrity of their products is the result of developing “unique packaging” solutions. It has also been stated that financial aspects or customer requirements are the decisive

element in the selection of the type of packaging, with innovation often relying on the customers’ requests.

Apart from firms practicing the notion of constant innovation, firms that shifted their focus from the consequences on road transport due to sea transport are also worth mentioning. Insulation, corner protection, stretch film, or even tapes have emerged, especially with firms shipping their products to countries with cold climates. Those firms that focus on proactive strategies, including tracking trade shows or looking for different routes, such as moving from the Serbian port, on the other hand, firms seem to accept the current situation if its problems are solely due to bureaucratic aspects. This situation demonstrates that innovation capacity varies across the sector and that the tendency to develop solutions is closely related to both the company’s resource level and external environmental conditions.

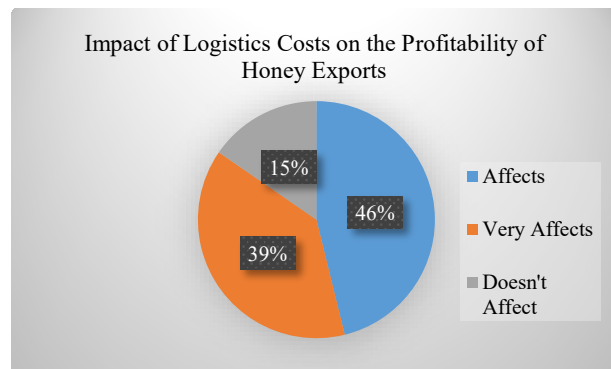


Figure 10. To what extent do logistics costs (transportation fees, fuel, storage, customs fees, etc.) affect the profitability of your honey exports?

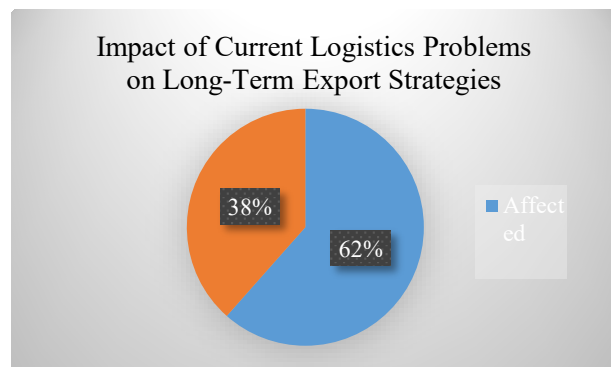


Figure 11. How have current logistics issues affected your long-term export strategies?

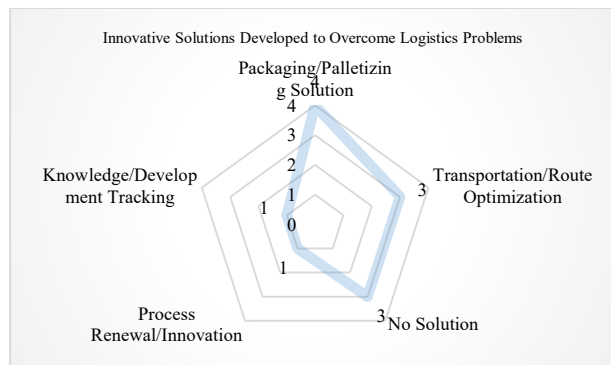


Figure 12. Have you developed any innovative solutions to overcome logistical problems?

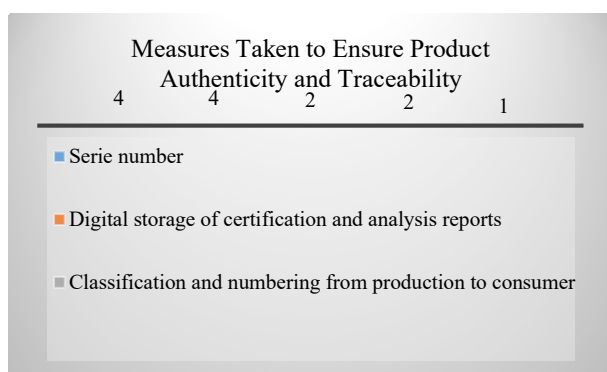


Figure 13. What measures do you take to ensure the authenticity and traceability of products?

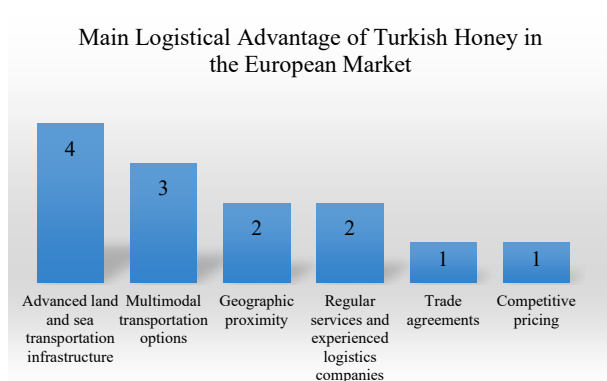


Figure 14. From a logistical perspective, what is your biggest advantage for Turkish honey in the European market?

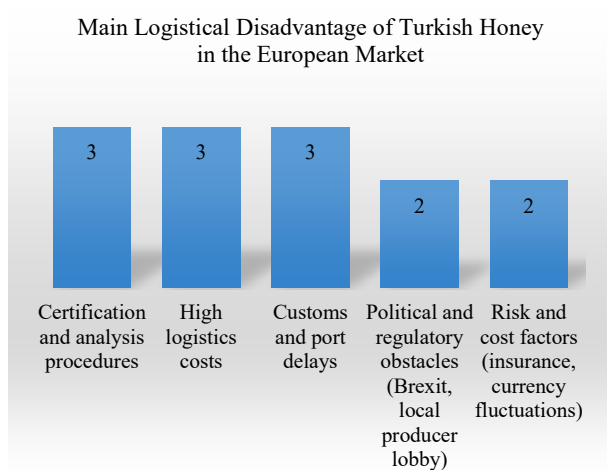


Figure 15. From a logistical perspective, what is your biggest disadvantage for Turkish honey in the European market?

When examining the responses in figure 13, it is seen that the most common method for ensuring product authenticity and traceability in honey exports is batch number tracking. The majority of participants stated that they ensure traceability through batch numbers specific to each product shipment and that these numbers play a critical role in both shipping and quality control processes. Some companies integrate certification practices based on international standards such as FSSC 22000 (Food Safety

System Certification 22000) and ISO (International Organization for Standardization) to strengthen this process. Furthermore, organic certification organized by certification bodies such as ECOCERT, Ecological Certification Organization, or sourcing honey from apiaries is also being developed as another step to reduce the risk of counterfeit or adulterated products. A fewer number of firms are utilizing advanced traceability techniques involving categorizing or preserving the sample from production to the end-user or the final customer. Moreover, the certification, analysis, or report is documented electronically, which is required to be distributed to the concerned authority if required, hence confirming the genuineness in addition to the traceability of the product. The current study indicates the firms involved in the exportation process from Türkiye to Europe are developing strategies beyond the requirement necessary to improve traceability mechanisms to ensure quality assurance or the credibility of their brands.

Based on figure 14, the most prominent logistical advantage of the exportation of honey from Türkiye to the European market is the well-developed land and sea transport system. This result clearly indicates that the well-developed road and sea transport system of Türkiye provides flexibility in the transport of the product to the EU countries.

Second, the feasibility of multimodal transport, which combines the possible uses of road, sea, air, or rail transport, provides the exporter with versatile transport solutions. The proximity of countries, standard timing, and qualified transport service providers result in advantages with regard to time reduction and risks involved.

In addition, the trade agreement, coupled with competitive pricing, also plays an important role in influencing the cost of logistics, acting as another factor that supports the competitiveness of the EU market. Notably, the data indicates that the logistics system, geographical location, or positioning of Türkiye grants the EU market access with a competitive advantage in honey.

Figure 15 illustrates the logistical challenges facing the exportation of Türkiye honey to the European markets, which include certification/analysis, logistics cost, and clearance/customs delay. The complexity involved in the certification and analysis process contributes to time wastage and extra cost, especially when the countries involved are requiring organic or quality certification. The high logistics cost is attributed by the lack of competition in the mode of transport, energy, or operation costs, making price the least deciding factor, especially for the small-scale exporter. The customs delay, the disruption of the supply chain, affects the transportation timing in an uncertain manner.

Political barriers, post-Brexit, or support from domestic suppliers in the EU, are other challenges for the facilitation of entry into the markets. Risk considerations, including insurance, currency risks, impair the transport considerations, affecting the long-range transport strategies. Taking all these challenges into account, the benefits are overshadowed to some extent, hence sustainable competitiveness is difficult in the EU markets for Türkiye.

## Discussion

The result from the study clearly indicates that the process of certification and analysis is the most time-consuming and expensive part of the process involved in the exportation of honey from Türkiye to other countries, including the EU, with longer periods of analysis delaying faster entry into the EU markets, supporting the claim that certification affects the efficiency of markets (Bosona & Gebresenbet, 2013; Nguyen, et al., 2021). Although the convenience sampling method provides limitations in terms of representativeness, the study was able to reach highly specialized actors, with arguments presented in literature accepting the value of non-probability sampling in gaining valuable insights from hard-to-reach populations (Adams, 2015; Bilici, 2024).

The cost of logistics revealed itself as an elemental consideration in the firms' export plan. The sensitivity of firms' profits, due to transportational expenses, indicates the importance of logistics in firms' profitability, considering the literature on the topic (Bowersox & Closs, 1996; Lhassan et al., 2022). The adaptability strategies of the involved exporters, ranging from different transport methods, insulated packing, to refrained markets, extensive markets, or intelligence, support innovation in the supply chain, confirming the firms' opportunity to devise solutions in the face of unsuitable structures, according to the literature on the topic (Lieb & Bentz, 2005; Storer et al., 2014). Digital traceability, coupled with FSSC 22000, ISO, or Ecocert certification, supports traceability, which is one of the imperatives of the food chain today, according to the literature on the topic (Jin, 2024).

Theoretical wise, the outcomes are consistent with the Resource-Based View, wherein specialized logistics capabilities and certification knowledge are core assets. The outcomes also are consistent with the Trade Facilitation View, wherein efficiency in trade procedures, fast processing, and efficient border control are crucial for lowering transaction costs thereby increasing the efficiency of the exporters. Furthermore, the extent to when exporters modify the routes, process, or digital platforms, the outcomes are consistent with the Dynamic Capabilities View, wherein the adaptability or modifications in the firm's resources on the basis of the constraints are crucial.

### *Comparative Positioning and Economic Consequences*

Internationally, there is consistent evidence that the inefficiency of the logistical chain translates into longer transport times, greater operational complexity, and lack of competitiveness for agricultural products exported from countries. Institutional quality, logistics, and trade are highly correlated, according to Engemann et al. (2022), with the Ethiopia perishable chain study conducted during the COVID-19 period confirming the sensitivity of the export chains to rising transport costs, Hirvonen et al. (2021). There is also Spanish case study proof that the lack of logistics capacity restricts the export possibilities of the country, according to Bensassi et al. (2015).

In the case of the honey industry in Türkiye, the entry of the country into the EU is also influenced by the heterogeneity of legislation on logistics, with differences in honey content, residues, or safety measures among the countries composing the EU raising the cost of compliance, which contributes to

certification bottlenecks (Morariu et al., 2024; Vigani et al., 2012). Exporters from countries with advantages in logistics are likely to gain greater shares of the markets compared with countries with logistics constraints, as observed in other settings, indicating the possibility of trade diversion due to cumulative certification and logistics barriers (Miadoková & Rýsová, 2023).

### *Policy and Industry Implications (Türkiye–EU Honey Corridor)*

The positioning of Türkiye within the EU honey market is also contingent on its ability to harmonize its rules, logistics, and technology with the expectations of the EU. The literature indicates how certification schemes, such as geographical indications, traceability, or other certification practices, improve the governance of supply chains, but their success depends on efficient logistics and available infrastructure (López-Bayón et al., 2018). The private retailer's rules, sustainability, or other demands about compliance create complex structures in food chains, especially requiring intermediaries who are well-informed (Ngutu et al., 2018; Grabs & Carodenuto, 2021). The private food safety rules of the EU also create complex structures in the global food chain, with the cost of certification creating serious challenges to the exportation of products (Rao et al., 2021; Ragasa et al., 2011).

A holistic approach is required to improve Türkiye's export capabilities. Economic incentives are necessary for rapid adoption of traceability or certification schemes, while efficient governance and optimized border controls will help improve the process of trade transactions (Stranieri et al., 2016; Talukder & Tripathi, 2021). Effective food safety governance structures are crucial in maintaining access to the market" (Grace et al., 2015), but current assessments stress the importance of adaptive food policy formulation, taking into consideration logistical challenges, and changes in EU rules on food safety (Rodrigues et al., 2025). Improvement in the efficiency of laboratories, electronic certification, cooperation between various bodies, and logistics will play crucial roles in helping Türkiye improve its prospects in the EU Honey Corridor

## Conclusion

The current study draws attention to the complex variables influencing the honey export outcomes of Türkiye to the EU, with certification efficiency, logistics capabilities, and adaptable firm strategies being the most prominent variables. Improvement of analysis capabilities, the application of technology in the certification of products, simplification of the customs process, and the pursuit of cheaper logistics solutions are required to improve their positioning in the marketplace (Nguyen et al., 2021; El-Sahli, 2025; Lhassan et al., 2022). The application of traceability technology and honest certification practices of quality can also help improve certification needs in the EU markets (Jin, 2024), while regional strategies aimed at the less crowded markets of the EU could amplify the scope of Türkiye's competitors (Pippinato et al., 2019).

Despite the limitations with respect to statistical generalizability, the study provides ground for future work. Future work could, for example, focus on the estimation of time-cost elasticities with the help of shipment data, compare honey with other agri-food products from Türkiye, or apply quasi-experimental methods to study innovations in policies, including e-certification/trusted trader schemes.

#### Appendix A. Semi-Structured Interview Protocol

- What modes of transportation do you use for your honey exports?
- What type of packaging and units do you typically export your products in? (For example, bulk honey barrels, tin cans, or retail glass jars)
- What are the main logistical challenges you encounter when exporting honey to Europe?
- Do you consider it necessary to maintain a cold chain during transportation?
- Do you encounter any difficulties with the procedures related to quality control and certification of products when exporting honey to the EU? For example, are the necessary laboratory analyses and certification/permit processes time-consuming? Have you ever experienced any rejection or detention of honey products sent to the EU at customs? (Yes/No – if so, please explain the reason.)
- Do you experience delays in your export deliveries due to disruptions in logistics processes (such as waiting at border crossings)? If so, how do these delays affect your delivery times and costs?
- To what extent do logistics costs (transportation fees, fuel, storage, customs fees, etc.) affect the profitability of your honey exports?
- How have current logistics problems affected your company's long-term export strategies? For example, have they caused you to postpone plans to expand into new markets or expand your exports?
- Have you developed any innovative solutions or applications within your company to overcome logistics problems? For example, a different packaging method, the use of specialized equipment, route optimization, etc.
- What measures do you take to ensure the authenticity and traceability of your products? (E.g., batch number tracking, blockchain-based tracking, geographical indication, international quality certifications)
- How do you utilize technology in your logistics operations? For example, are sensors, IoT devices, or specialized software used to monitor temperature and location during transportation? (If yes/no, please provide details.)
- In your opinion, what is the most urgent logistical problem that needs to be solved in honey exports?
- Have you complied with the new EU regulation (EU 2023/2652) requiring you to be a "registered business in the EU"?
- From a logistical perspective, what are your biggest advantages and biggest disadvantages for Turkish honey in the European market?

#### Declarations

##### *Author Contribution Statement*

Conceptualization, Investigation, Writing-review & editing

##### *Conflict of Interest*

The author declare no conflict of interest.

##### *Ethics Approval*

The survey section of this study was approved by the Ethics Committee of Mudanya University, and the survey form was reviewed and deemed appropriate at the Ethics Committee meeting numbered 2025/5-2.

##### *Informed Consent*

All participants provided written informed consent prior to participation in the study. The purpose, scope, and confidentiality principles of the research were explained to each participant before data collection.

##### *Confidentiality and Anonymization*

To ensure confidentiality, all personal identifiers were removed from the transcripts. Participants are referred to using pseudonyms or codes throughout the analysis, and no identifying information is disclosed in the published results.

##### *Data Availability*

The de-identified transcripts and codebook generated during the current study are available from the corresponding author upon reasonable request. Data sharing complies with institutional and ethical requirements and may be provided under a restricted-access agreement.

#### References

- Adams, W. C. (2015). Conducting semi-structured interviews. In K. E. Newcomer, H. P. Hatry, & J. S. Wholey (Eds.), *Handbook of practical program evaluation* (pp. 492–505). Jossey-Bass.
- Akdeniz, G., & Kantar, A. (2022). Analysis of honey export potential and competitiveness of Türkiye. *Bee Studies*, 14(2), 55–61. <https://doi.org/10.51458/BSTD.2022.29>
- Al-Khatib, A. (2023). The determinants of export performance in the digital transformation era: Empirical evidence from manufacturing firms. *International Journal of Emerging Markets*, 19(10), 2597–2622. <https://doi.org/10.1108/ijoem-08-2022-1223>
- Altunışık, R., Coşkun, R., Bayraktaroğlu, S., & Yıldırım, E. (2010). *Sosyal bilimlerde araştırma yöntemleri: SPSS uygulamalı* (6. bs.). Sakarya Yayıncılık.
- Altunay, E., Gülşin, O., & Yalçınkaya, M. (2014). Eğitim kurumlarında mobbing uygulamalarına ilişkin nitel bir araştırma. *Sakarya University Journal of Education*, 4(1), 62–80.
- Arifin, M., Arini, R. W., Herdianto, B., & Muliati, K. P. (2022). Application of good logistics practices to export-oriented SMEs through export regulation applications. *OPSI*, 15(2), 293–302. <https://doi.org/10.31315/opsi.v15i2.8242>
- Aydoğan, E., & Aydemir, M. F. (2022). Blockchain-based e-commerce: An evaluation. *International Journal of Social Inquiry*, 15(2), 649-666. <https://doi.org/10.37093/ijsi.1166643>

- Bayram, N., Yüzer, M. O., & Bayram, S. (2019). Melissopalynology analysis, physicochemical properties, multi-element content and antimicrobial activity of honey samples collected from Bayburt, Turkey. *Uludağ Bee Journal*, 19(2), 161–176. <https://doi.org/10.31467/uluaricilik.618289>
- Bensassi, S., Márquez-Ramos, L., Martínez-Zarzoso, I., & Burguet, C. (2015). Relationship between logistics infrastructure and trade: Evidence from Spanish regional exports. *Transportation Research Part a Policy and Practice*, 72, 47–61. <https://doi.org/10.1016/j.tra.2014.11.007>
- Bilici, F. (2024). Tüketicilerin doğal bal algısı ve satınalma davranışlarını etkileyen faktörler üzerine bir araştırma. *Uludağ Arıcılık Dergisi*, 24(1), 93–125. <https://doi.org/10.31467/uluaricilik.1431615>
- Bosona, T., & Gebresenbet, G. (2013). Food traceability as an integral part of logistics management in food and agricultural supply chain. *Food Control*, 33(1), 32–48. <https://doi.org/10.1016/j.foodcont.2013.02.004>
- Bowersox, D. J., & Closs, D. J. (1996). *Logistical management: The integrated supply chain process*. McGraw-Hill.
- Çevrimli, M. B., Arıkan, M. S., & Tekindal, M. A. (2020). Honey price estimation for the future in Turkey; example of 2019–2020. *Ankara Üniversitesi Veteriner Fakültesi Dergisi*, 67(2), 143–152. <https://doi.org/10.33988/auvfd.570790>
- Christopher, M. (2016). *Logistics & supply chain management*. Pearson Education.
- Daleth Group. (2024). Strengthening control over honey imports to the EU. <https://dalethgroup.com/en/strengthening-control-over-honey-imports-to-the-eu-new-requirements-for-exporters/> (Accessed: 23.06.2025)
- El-Sahli, Z. (2025). Asymmetric free trade agreements and misalignment of incentives: Lessons from the European Union–Turkey customs union. *JCMS: Journal of Common Market Studies*, 63(4), 1099–1118. <https://doi.org/10.1111/jcms.13684>
- Engemann, H., Jafari, Y., & Heckeley, T. (2023). Institutional quality and the duration of agri-food trade flows. *Journal of Agricultural Economics*, 74(1), 135–154. <https://doi.org/10.1111/1477-9552.12491>
- Galvin, R. (2015). How many interviews are enough? Do qualitative interviews in building energy consumption research produce reliable knowledge? *Journal of Building Engineering*, 1, 2–12. <https://doi.org/10.1016/j.job.2014.12.001>
- Grabs, J., & Carodenuto, S. (2021). Traders as sustainability governance actors in global food supply chains: A research agenda. *Business Strategy and the Environment*, 30(2), 1314–1332. <https://doi.org/10.1002/bse.2686>
- Grace, D., Mahuku, G., Hoffmann, V., Atherstone, C., Upadhyaya, H., & Bandyopadhyay, R. (2015). International agricultural research to reduce food risks: Case studies on aflatoxins. *Food Security*, 7(3), 569–582. <https://doi.org/10.1007/s12571-015-0469-2>
- Hirvonen, K., Minten, B., Mohammed, B., & Tamru, S. (2021). Food prices and marketing margins during the covid-19 pandemic: Evidence from vegetable value chains in ethiopia. *Agricultural Economics*, 52(3), 407–421. <https://doi.org/10.1111/agec.12626>
- Ivanova, M. (2022). Evaluation of risks to Russian food supply chains during the COVID-19. *Management Science and Business Decisions*, 2(1), 40–47. <https://doi.org/10.52812/msbd.42>
- Jin, L. (2024). Exploration of cross-border e-commerce and its logistics supply chain innovation and development path for agricultural exports based on deep learning. *Applied Mathematics and Nonlinear Sciences*, 9(1), 1–12. <https://doi.org/10.2478/amns.2023.2.01529>
- López-Bayón, S., Díaz, M., Solís-Rodríguez, V., & Barcala, M. (2018). Governance decisions in the supply chain and quality performance: The synergistic effect of geographical indications and ownership structure. *International Journal of Production Economics*, 197, 1–12. <https://doi.org/10.1016/j.ijpe.2017.12.022>
- Kadiroğlu, A. (2024). Natural honey production and export performance in Türkiye. *BinBee – Arı ve Doğal Ürünler Dergisi*, 4(1), 1–8. <https://pikom.bingol.edu.tr/media/31868/binbee-dergisi-cilt-4-sayi-1-2024-hazi-ran.pdf>
- Karipidis, P., Chrysochou, P., & Karypidou, I. (2020). The importance of relationship characteristics in the export performance of food firms. *British Food Journal*, 122(4), 1305–1320. <https://doi.org/10.1108/bfj-05-2019-0376>
- Kıvrak, Ş., Kıvrak, İ., & Karababa, E. (2016). Characterization of Turkish honeys regarding physicochemical properties, and their adulteration analysis. *Food Science and Technology*, 37(1), 80–89. <https://doi.org/10.1590/1678-457x.07916>
- Kumar, A., Vahoniya, D., & Rajwadi, A. (2024). Navigating the honey markets across Europe and Africa. *Asian Journal of Agricultural Extension, Economics & Sociology*, 42(5), 266–275. <https://doi.org/10.9734/ajaees/2024/v42i52436>
- Kükürer, M., Kence, M., & Kence, A. (2021). Honey bee diversity is swayed by migratory beekeeping and trade despite conservation practices: Genetic evidence for the impact of anthropogenic factors on population structure. *Frontiers in Ecology and Evolution*, 9, 1–15. <https://doi.org/10.3389/fevo.2021.556816>
- Larch, M., Schmeißer, A., & Wanner, J. (2020). A tale of (almost) 1001 coefficients: The deep and heterogeneous effects of the EU-Turkey customs union. *JCMS: Journal of Common Market Studies*, 59(2), 242–260. <https://doi.org/10.1111/jcms.13058>
- Lhassan, I. A., Ezekari, M., Belamhitou, M., & El Elachimi, I. (2022). The effect of logistics performance determinants on export performance. *International Journal of Research in Business & Social Science*, 11(5), 57–66. <https://doi.org/10.20525/ijrbs.v11i5.1849>
- Lieb, R. C., & Bentz, B. A. (2005). The use of third-party logistics services by large American manufacturers: The 2004 survey. *Supply Chain Management: An International Journal*, 10(1), 33–41. <https://doi.org/10.1108/13598540510578324>
- Litfin, K. T. (2017). *Eko köyler*. Alfa Yayınevi.
- Miadoková, N. and Rýsová, L. (2023). Institutional factors of international trade: A case of the european union's generalized system of preferences and world trade organization. *Terra Economicus*, 21(4), 123–134. <https://doi.org/10.18522/2073-6606-2023-21-4-123-134>
- Morariu, I., Avasilcăi, L., Vieriu, M., Lupu, V., Ioniuc, I., Morariu, B., ... & Trandafir, L. (2024). A comprehensive narrative review on the hazards of bee honey adulteration and contamination. *Journal of Food Quality*, 2024, 1–13. <https://doi.org/10.1155/2024/3512676>
- Nguyen, V., Pham, V., & Phan, T. (2021). Determinants of export organic supply chain performance: Empirical study of fruits and vegetables in Vietnam. *Journal of International Logistics and Trade*, 19(3), 147–161. <https://doi.org/10.24006/jilt.2021.19.3.147>
- Ngutu, M., Bukachi, S., Olungah, C., Kiteme, B., Kaeser, F., & Haller, T. (2018). The actors, rules and regulations linked to export horticulture production and access to land and water as common pool resources in Laikipia County, northwest Mount Kenya. *Land*, 7(3), 110. <https://doi.org/10.3390/land7030110>
- Pippinato, L., Di Vita, G., & Brun, F. (2019). Trade and comparative advantage analysis of the EU honey sector with a focus on the Italian market. *Calitatea*, 20(2), 485–492.

- Ragasa, C., Thornsbury, S., & Joshi, S. (2011). Are food certification costs misestimated? Exporter-perspective on the European standard. *Journal of Agricultural Economics*, 62(3), 669–689. <https://doi.org/10.1111/j.1477-9552.2011.00307.x>
- Rao, M., Bast, A., & Boer, A. (2021). European private food safety standards in global agri-food supply chains: a systematic review. *International Food and Agribusiness Management Review*, 24(5), 739–754. <https://doi.org/10.22434/ifamr2020.0146>
- Rodrigues, J., Saraiva, C., García-Díez, J., Castro, J., & Esteves, A. (2025). Evaluating the effectiveness of food safety policies in Portugal: A stakeholder-based analysis of challenges and opportunities for food safety governance. *Foods*, 14(9), 1534. <https://doi.org/10.3390/foods14091534>
- Rodrigue, J. P., & Notteboom, T. (2010). *The geography of transport systems* (2nd ed.). Routledge.
- Sagareishvili, N. (2021). The role of maritime logistics and supply chain in stimulating the export of agricultural products. *MATEC Web of Conferences*, 339, 1–8. EDP Sciences.
- Storer, M., Hyland, P., Ferrer, M., Santa, R., & Griffiths, A. (2014). Strategic supply chain management factors influencing agribusiness innovation utilization. *The International Journal of Logistics Management*, 25(3), 487–521. <https://doi.org/10.1108/IJLM-02-2013-0026>
- Stranieri, S., Cavaliere, A., & Banterle, A. (2016). Voluntary traceability standards and the role of economic incentives. *British Food Journal*, 118(5), 1–13. <https://doi.org/10.1108/bfj-04-2015-0151>
- Syed, F. U. (2023). Supply chain management and modelling in the era of industry 4.0: Insights and strategies for resilience and sustainability. *Industrial Management Advances*, 1(2), 1–2. <https://doi.org/10.59429/ima.v1i1.121>
- Talukder, B., & Tripathi, S. (2021). Impact of supply chain performance on firms' export capability: Development of a statistical model. *Global Business Review*. 1-20. <https://doi.org/10.1177/09721509211044303>
- Tarımsal Ekonomi ve Politika Geliştirme Enstitüsü (TEPGE). (2024). *Arıcılık ürün raporu*. <https://arastirma.tarimorman.gov.tr/tepge/Belgeler/PDF%20%C3%9Cr%C3%BCn%20Raporlar%C4%B1/2024%20%C3%9Cr%C3%BCn%20Raporlar%C4%B1/Ar%C4%B1c%C4%B1%20%C3%9Cr%C3%BCn%20Raporu%2024-393%20TEPGE.pdf> (Accessed: 26.06.2025)
- Vigani, M., Raimondi, V., & Olper, A. (2012). International trade and endogenous standards: The case of gmo regulations. *World Trade Review*, 11(3), 415–437. <https://doi.org/10.1017/s1474745612000262>
- Yao, Q., & Zhang, H. (2022). Improving agricultural product traceability using blockchain. *Sensors*, 22(9), 1-23.
- Yıldırım, A., & Şimşek, H. (2016). *Sosyal bilimlerde nitel araştırma yöntemleri* (10. bs.). Seçkin Yayıncılık.
- Yücel, G. (2014). The effects of EU customs union integration on Turkish intra-industry trade. *Emaj Emerging Markets Journal*, 4(1), 17–32. <https://doi.org/10.5195/emaj.2014.60>