



# Analysis of Honey Export Potential and Competitiveness of Türkiye

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## Abstract

The rich vegetation of Türkiye, different climatic zones and honey bee gene resources make the country's beekeeping activities advantageous. Türkiye has an important potential with the presence of colonies and honey production. In 2021, 96344 tons of honey was produced with 8733394 colonies, and 9994 tons of honey was exported to 66 countries for 31148000 dollars. This study was designed to reveal the honey export structure and competitiveness of Türkiye in the 2002-2021 period. In Türkiye's honey trade, the USA (29.64%), Germany (22.32%) and Spain (7.22%) are the main importing countries. It has been determined that Türkiye is a net exporter country in the 2002–2021 periods. Türkiye is predominantly a country with medium and weak comparative advantage. The Revealed Comparative Advantages (RCA), Revealed Symmetric Comparative Advantages (RSCA), Trade Balance (TBI) values calculated with Türkiye's 2021 data was found 1.13, 0.06 and 0.98 respectively. These values show that Türkiye is a net exporter and a highly competitive country with a declared comparative advantage. Providing Türkiye's access to rapidly growing markets in direct proportion to its beekeeping capacity and potential will make Türkiye a more competitive country

## Introduction

Honey; it is a natural product that plant the nectars, secretions from living parts of plants, or secretions of plant – sucking insects living on living parts of plants after being collected by the honey bee *Apis mellifera*, modify it by combining with its unique substances, reduce its water content, and nature it by storing it in the honeycomb (Anonymous, 2022a).

1 million 770 thousand 119 tons of honey were produced with 93999656 colonies in the world. In the last 10 years, an increase of 16.9% in the number of colonies and an increase of 8.81% in honey production has been achieved. In terms of the number of colonies, India comes first with 2204850 colonies. India is followed by China with 9337361 colonies, Türkiye with 8179085 colonies, Iran with 7140561 colonies, Etiopia with 6986100 colonies, Tanzania with 3003012 colonies, Argentina with 2983247 colonies, Russia with 2982452 colonies, USA with 2706000 colonies and Korea with 2162250 colonies respectively. In terms of honey production, China is followed by Türkiye with 104403 tons, Ukraine with 68028 tons, USA with 66948 tons,

Russia with 66368 tons, India with 62123 tons, Mexico with 54165 tons and Brazil with 51508 tons respectively (Anonymous, 2022b).

Compared to sugar and other sweeteners, the higher nutritional properties of honey and the positive health effects of honey are the most important factors that trigger the global honey supply. Honey trade in the world is increasing its importance day by day. The world honey market is undergoing a major transformation as a result of fluctuating exchange rates and commodity prices, increasing raw material costs, global farming, colony losses and globalization of cultures. This transformation brings the competitiveness between countries to the fore.

Although there are many studies on the concept of competitiveness, a general theory on international competitiveness has not been established (Mitschke, 2008). International competitiveness can be examined at different levels such as product, company, sector, region, country, trade block or a part of world trade, as the reasons for the lack of an accepted definition of international competitiveness. Because there are different forms of competitiveness, different ways of

measuring the competitiveness of companies, sectors and economies are required, depending on the level of micro or macro discussion. There is no consensus on the concept among academics dealing with international competition issues. Existing literature reviews reveal a lack of clear consensus on the exact meaning of international competitiveness stems from the concept of competition. Others argue that the roots of international trade theories. For this reason, many definitions describing the concept of international competitiveness make it a variable concept (Olczyk, 2016a; Olczyk, 2016b).

It is seen that the competitiveness studies on the international honey trade of the countries are quite limited. The main studies on the subject are as follows; China's honey export competitiveness (Ma, 2009; Song & Jensen, 2014); Serbia's honey export competitiveness (Ignjatijević et al., 2015; Ignjatijević et al., 2018; Cvijanović & Ignjatijević, 2020); Italy's honey export competitiveness (Pippinato et al., 2019); Mexico's honey export competitiveness (Magana Magana et al., 2017; Avila et al., 2019); honey export competitiveness of Brazil (Paula et al., 2016a; Paula et al., 2016b; Paula et al., 2016c; Paula et al., 2017; Campos et al., 2018); honey export competitiveness of selected European Countries (Pocol et al., 2017; Covaci, 2020). Comparison of honey export competitiveness of Türkiye with Balkan countries (Terin et al., 2018).

In Türkiye, 89631 beekeeping enterprises produced 96344 tons of honey with 8733394 colonies in 2021. Honey production in 2021 decreased by 7.4% compared to the previous year due to adverse climatic conditions and forest fires. In the last 20 years in Türkiye, the beekeeping business has increased by 297% (Anonymous, 2022c). The rich honey bee gene resources and advantageous flora and climatic conditions, which spread over a wide area in the Anatolian geography, have caused Türkiye to become one of the important actors of the World beekeeping sector.

In this study; It is aimed to explain Türkiye's honey export performance an international competitiveness between the years 2002-2021 with the Revealed Comparative Advantages (RCA), Revealed Symmetric Comparative Advantages (RSCA) and Trade Balance (TBI) indexes.

## Material and Methods

In this study; it is aimed of the study consists of secondary data at the macro level. Honey foreign trade data used in the study and covering the period 2002 – 2021 were taken from the "Trade statistics for international business development (Trade Map)" database. In the study, foreign trade data of 0409 coded "Natural Honey", which is a subgroup of 04 coded "Dairy produce; eggs; natural honey; edible products of animal origin, not elsewhere specified or included" product group and included in Harmonized product Classification (HC), was used.

The first criterion used to determine the competitiveness of Türkiye's honey foreign trade is the Revealed Comparative Advantages index. Liesner (1958), was the first to introduce the Revealed Comparative Advantages (RCA) index to the literature. Later, it was redefined and developed by Balassa (1965). Balassa's RCA approach assumes that the true form of comparative advantage can be observed from post – trade data. With this approach, Balassa tries to determine whether a country has an 'explained' comparative advantage in the relevant commodity or sector.

Balassa's RCA index is formulated as:

$$RCA_{ij} = [(X_{ij} / X_i) / (X_{wj} / X_w)]$$

$RCA_{ij}$ , the comparative advantage index announced for the 'j' sector of country 'i',

$X_{ij}$  exports of 'j' sector of country 'i',

$X_i$  'i' country's total exports,

$X_{wj}$  'j' sector's exports to the world,

$X_w$  represents the world's total exports.

Where the index value is greater than 1, the country has a revealed comparative advantage in the relevant good; in cases where the index value is less than 1, it is concluded that the country does not have a comparative advantage in the relevant product (Mushanyuri & Mzumara, 2013).

The RCA index value was categorized as follows by Hinloopen and Marrewijk (2001).

$0 < RCA \leq 1$ : No comparative advantage

$1 < RCA \leq 2$ : Weak comparative advantage

$2 < RCA \leq 4$ : Medium comparative advantage

$4 < RCA$ : Strong comparative advantage

The second criterion used in the measurement of competitiveness is the "Revealed Symmetric Comparative Advantages (RSCA)" index. This index is formulated as follows:

$$RSCA_{ij} = (RCA_{ij} - 1) / (RCA_{ij} + 1)$$

The RSCA index takes a value between -1 and +1. If the index value is positive, the country has competitiveness in that product; if it is negative, it indicates that the country has a comparative disadvantage in the trade of that product (Dalum et al., 1998).

The last criterion used to measure competitiveness is the Trade Balance Index (TBI). This index developed by Lafay is used to determine whether a country is a net exporter or a net importer of the relevant product (Ishchukova & Smutka, 2013a; Ishchukova & Smutka, 2013b).

The index is formulated as:

$$TBI_{ij} = (X_{ij} - M_{ij}) / (X_{ij} + M_{ij})$$

$TBI_{ij}$ , the country's trade balance of goods  $j$ ;

$X_{ij}$ , the exports of product " $j$ "

$M_{ij}$ , the imports of product " $j$ "

TBI index takes a value between -1 and +1 (ShariatUllah & Kazuo, 2012).

If  $TBI_{ij} > 0$ , the country is a net exporter.

If  $TBI_{ij} < 0$ , the country is a net importer.

## Results and Discussion

World honey exports increased by 378% in the 2002-2021 period. In the analyzed period, the total honey export value in the world was 33239558000 dollars, and the total honey export value in Türkiye was 326429000 dollars. Türkiye's average share in world honey exports over the years has been 1.121%. In the category of all goods subject to export, Türkiye's total exports constitute an average of 0.814% of the world's total exports (Table 1).

**Table 1.** Export data for Türkiye and the World for 2002-2021(\$ 1000), (Anonymous, 2022d)

Years	Türkiye's Honey Exports	World's Honey Exports	Share (%)	Türkiye's Total Goods Exports	World's Total Goods Exports	Share (%)
2002	32335	719019	4.497	35761981	6432105964	0.556
2003	37090	960880	3.860	47252836	7498530918	0.630
2004	16329	852304	1.916	63120949	9110737596	0.693
2005	6564	708660	0.926	73476408	10360495753	0.709
2006	5499	829836	0.663	85534676	11979108568	0.714
2007	1759	897138	0.196	107271750	13809800618	0.777
2008	2286	1329366	0.172	132027196	16007659828	0.825
2009	4495	1293905	0.347	102142613	12384813282	0.825
2010	5811	1497393	0.388	113883219	15098981170	0.754
2011	5206	1724579	0.302	134906869	18141372916	0.744
2012	6007	1779265	0.338	152461737	18399990900	0.829
2013	13020	2081259	0.626	161480915	18858726557	0.856
2014	18934	2338421	0.810	166504862	18862399126	0.883
2015	25072	2324938	1.078	143844066	16416895796	0.876
2016	14926	2228806	0.670	142606247	15923096945	0.896
2017	23385	2391744	0.978	156992940	17561440015	0.894
2018	25669	2264578	1.134	167923862	19327897410	0.869
2019	24763	1988243	1.245	180870841	18750885146	0.965
2020	26161	2320105	1.128	169657940	17488466269	0.970
2021	31148	2717309	1.146	225264314	22112533133	1.019

In 2021, Türkiye exported 9994 tons of honey to 66 countries for 31148000 dollars. In Türkiye's honey trade,

the USA (29.64%), Germany (22.32%) and Spain (7.22%) are the main importing countries (Table 2).

**Table 2.** Countries importing honey from Türkiye in 2021, (Anonymous, 2022d)

Importers	Value exported in 2021 (USD thousand)	Share (%)	Quantity exported in 2021 (ton)	Share (%)
World	31148	100	9994	100
United States of America	9231	29.6	2916	29.2
Germany	6951	22.3	1544	15.4
Spain	2250	7.2	1101	11.0
Bulgaria	1125	3.6	799	8.0
Israel	975	3.1	492	4.9
Belgium	907	2.9	217	2.2
United Arab Emirates	831	2.7	176	1.8
United Kingdom	738	2.4	229	2.3
Slovakia	721	2.3	497	5.0
Netherlands	623	2.0	136	1.4
Kuwait	603	1.9	103	1.0
Qatar	532	1.7	116	1.2
Italy	505	1.6	324	3.2
Canada	410	1.3	75	0.8
Japan	397	1.3	57	0.6
Poland	393	1.3	259	2.6
Oman	346	1.1	73	0.7
Australia	301	1.0	85	0.9
Hong Kong, China	277	0.9	59	0.6
Slovenia	273	0.9	43	0.4
Other	2759	8.9	693	7.0

The countries importing honey from Türkiye and their distribution by value are given in Figure 1 and Table 2. Comb honey constitutes 23% of honey exports in terms of quantity. Türkiye provided 12427000 dollars income from honeycomb export. When we look at the countries where honeycomb honey is exported, Germany takes the first place with 933635 kg. Germany is followed by the USA with 652082 kg, United Arab Emirates with 105621 kg, Spain with 92186 kg, Belgium

with 88976 kg, and Japan with 50097 kg, respectively. Türkiye's income from the export of filtered honey covers 59.1% of the total honey export. Türkiye earned 18427000 dollars in exchange for 7701743 kg of filtered honey. The USA comes first with 2263000 kg of filtered honey from Türkiye. The USA is followed by Spain with 1008550 kg, Germany with 609979 kg, Bulgaria with 798536 kg, Slovakia with 496825 kg, Israel with 491625 kg (Anonymous, 2022d).

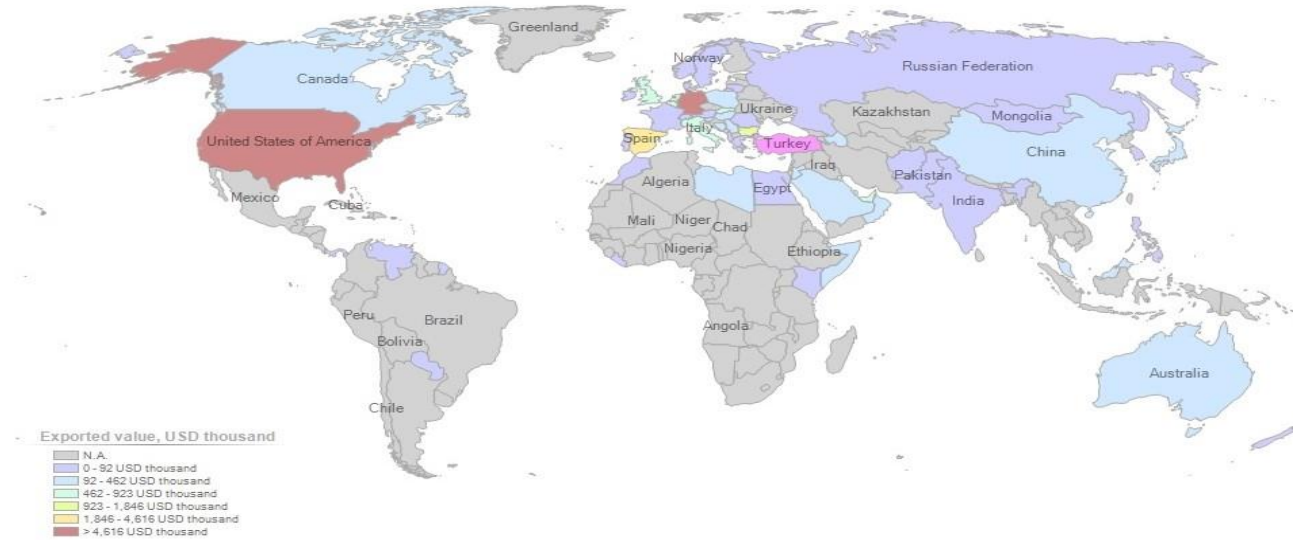


Figure 1. Countries to which Türkiye exports honey in 2021, (Anonymous, 2022d)

While countries such as Kuwait, Poland, Spain, Japan, Qatar, Oman, Canada, Italy, the United Arab Emirates, Belgium, Slovakia, the Netherlands and Bulgaria, which have a limited share in Türkiye's honey export, are rapidly growing markets; England, Israel, Australia and Hong Kong appear as shrinking markets. Germany, which has a large share in Türkiye's honey export, represents the shrinking market, while the USA represents the rapidly growing market. The USA and Germany, whose shares in Türkiye's honey export are 29.64% and 22.32%, respectively, and

whose shares of global imports are 24.8% and 11.61%, respectively.

Average annual growth rates in the export value of countries in Türkiye's honey trade between 2017-2021 were 3% in the USA, 22% in Spain, 31% in Israel, 15% in Belgium, 39% in the United Arab Emirates, and 28% in Netherlands 39% in Kuwait, 14% in Qatar, 6% in Italy, 23% in Canada, 185% in Japan, 58% in Poland, 103% in Oman, 77% in Australia, 93% in Hong Kong and 28% in Slovenia, respectively (Figure 2).

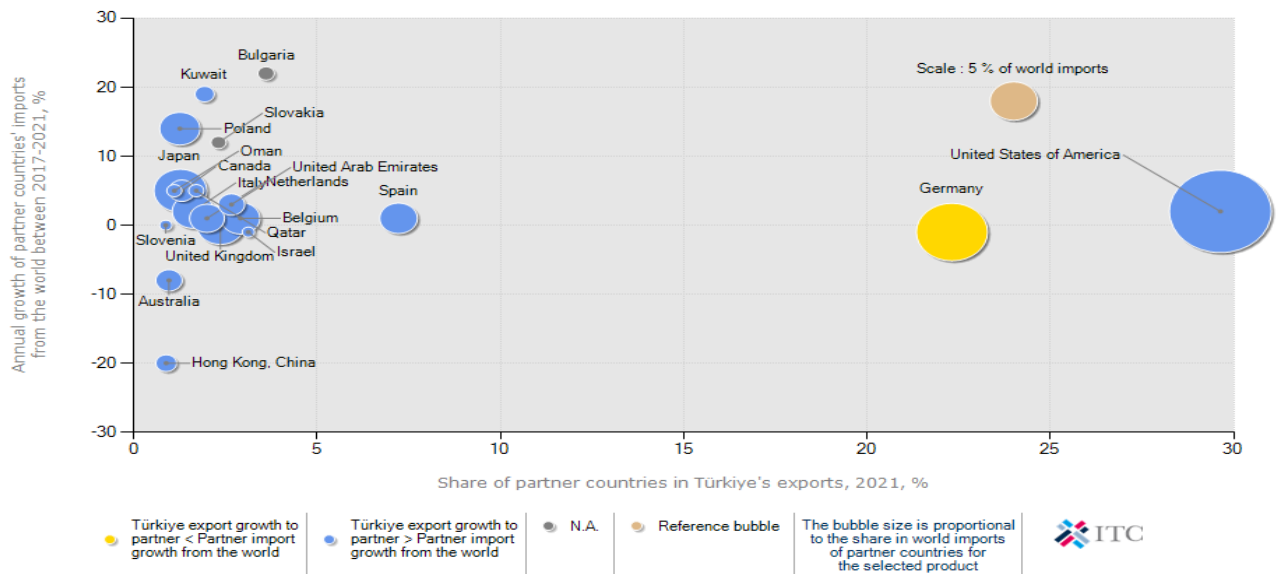


Figure 2. Potential graph for market diversification of honey exported by Türkiye, (Anonymous, 2022d)

**Table 3.** Türkiye's competitiveness indexes by years

Years	RCA	RSCA	TBI
2002	8.09	0.78	0.96
2003	6.13	0.72	0.94
2004	2.77	0.47	0.92
2005	1.31	0.13	0.85
2006	0.93	-0.04	0.96
2007	0.25	-0.60	0.78
2008	0.21	-0.65	-0.27
2009	0.42	-0.41	0.95
2010	0.51	-0.32	1.00
2011	0.41	-0.42	1.00
2012	0.41	-0.42	1.00
2013	0.73	-0.16	0.97
2014	0.92	-0.04	0.98
2015	1.23	0.10	1.00
2016	0.75	-0.14	1.00
2017	1.09	0.04	1.00
2018	1.30	0.13	0.99
2019	1.29	0.13	0.98
2020	1.16	0.08	0.98
2021	1.13	0.06	0.98
<b>Average</b>	1.55	-0.03	0.90

The Revealed Comparative Advantage Index calculated for Türkiye's honey export is given in Table 3. The RCA average for the 2002-2021 period was found to be 1.55. The average value obtained shows that Türkiye has a comparative advantage. Between the years 2006-2014 and in 2016, it is seen that the RCA values remained below 1 and did not have a comparative competitiveness. When the RCA indices are evaluated according to the Hinloopen and Van Marrewijk (2001), classification, it is seen that Türkiye had a strong comparative advantage in 2002 and 2003, moderate comparative advantage in 2004, did not have a comparative advantage in 2006-2014 and 2016, and appeared to have a weak competitiveness for other years. Türkiye's Revealed Symmetric Comparative Advantages (RSCA) index results are similar to the RCA index results. In the analyzed period, Türkiye's RSCA average was -0.03. Although Türkiye seems to have had a competitive advantage in the last 5 years according to the RSCA index; the values obtained show a tendency towards a comparative disadvantage in honey trade. When the values of Turkey's trade index are examined, it is clear that the country is a net exporter in all years except 2008. The mean TBI in the analyzed period was found to be 0.90. (Table 3). Türkiye, which became a net importer only in 2008; it imported 4 million dollars of honey from Argentina, Mexico and Uruguay, and also exported 2286000 dollars to mainly Germany and Hungary, as well as Cyprus,

Saudi Arabia, Denmark, Belgium, Iraq, the United Arab Emirates and Albania. Terin et al. (2018), in the study that put forward the competitiveness of Türkiye and the Balkan Countries in honey exports in the period 2001-2015, stated that although Türkiye is a net honey exporter country, its competitiveness in honey trade is weak. In the honey trade competition, Türkiye is less competitive than Moldova, Bulgaria, Romania, Serbia, Croatia and Greece; it was determined to be more competitive than Macedonia, Albania, Bosnia and Herzegovina, Montenegro and Slovenia. In the RCA index study conducted by Ma (2009), with export values for 2006, it was found that China, Argentina and Mexico have a competitive advantage in honey exports, and Argentina has significantly higher index values than Mexico and China, it was reported that China's competitive advantage, affected by international trade barriers, is relatively weak. It is stated by Pippinato et al. (2019), that European Union countries are not very competitive in honey exports and are strongly inclined towards imports. It is noticed that Italy shows a significant comparative disadvantage when compared to Romania, which produces larger quantities in the trade of this product, Spain, and Germany highly specialized in trade. Chinese honey is less competitive than Argentine honey in the US and EU markets (Song & Jensen, 2014). It was reported by Paula et al. (2017), that Brazil was competitive in exporting natural honey products from 2002 to 2015.

## Conclusion

As a result, it has been determined that Türkiye is a net exporter country in the 2002-2021 period. Türkiye is predominantly a country with medium and weak comparative advantage. The average RSCA value of the examined period shows that the country has a comparative disadvantage in honey trade. Considering the last 5 years of RSCA values for Türkiye, it is seen that it is a country with competitiveness in line with its potential. With its colony presence and honey and beeswax production potential, Türkiye is one of the most important players in the global beekeeping sector. Türkiye is a country with a high potential in terms of different geographical features, different climatic zones, honey bee gene resources, and plant genetic richness and diversity as it progresses from north to south and west to east. Beekeeping in Türkiye is an agricultural activity that has a conventional and organic production types has gained a professional status, and is carried out in every region of Türkiye. In the Mediterranean region of Türkiye, the nectar flow that starts with citrus continues with monofloral and polyfloral honeys in the Black Sea, Marmara and Anatolian regions and ends with pine honey produced in the Aegean and Mediterranean regions. 24 honeys including thyme, chestnut, geven, pine and oak monofloral honeys and flower honeys produced in different locations between 2017 and 2022 by the Turkish Patent and Trademark Office have been given geographical indications. When the distribution of geographical indications in Türkiye by product groups is evaluated, honey comprises 2% of all product groups. This rate is expected to increase steadily in the coming years. Many monofloral and polyfloral honeys such as oak, chestnut, sunflower, cotton, acacia, geven, thyme, lavender, chasteberry, etc., which have high yields, especially pine honey, deserve to be registered on an international scale. Considering the current potential of Türkiye's place in the world honey trade, it is seen that it is not at the desired level. Bringing the high capacity in the beekeeping sector to the fore and providing access to rapidly growing markets will make Türkiye a more competitive country.

## Ethical Statement

Ethics certificate is not required.

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## Conflict of Interest

The author declare no conflict of interest.

## Author Contributions

The authors contributed on an equal footing and there was no conflict between the authors.

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