

CURRENT STATUS AND DEVELOPMENT IN BEEKEEPING SECTOR IN TURKEY AND IN THE WORLD

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Abstract

The objective of this study was to examine the current status and development of the beekeeping sector in Turkey and in the world during the 2000-2013 period. Whereas honey production in the world was 1.3 million tons during the 2000-2002 period, it increased by 31% reaching 1.7 million tons in 2013. China is ranked number one in the world with a share of 27%, whereas Turkey is ranked number two with a share of 6%. Turkey is followed by Argentina, Ukraine and Russia in order. When the significant honey producing countries in the world are compared with respect to their shares among the world colony existence, it can be observed that China is ranked number one with a ratio 22%, India is ranked second with a share of 14% and Turkey is ranked number three with a share of 8%. 35% of all honey produced in the world is exported. Whereas world honey export was 380 thousand tons during the 2000-2002 period, it increased by 53% reaching 583 thousand tons in 2013. China is ranked number one in the world for honey export with a share of 21% and Argentina is ranked number two with a share of 11%. Whereas Turkey is ranked number 26 in the world with a 1% share of world honey export. Low honey export in Turkey is due mostly to the fact that the majority of the produced honey is consumed domestically. When world honey import is examined, it can be observed that the USA is ranked number one with a share of 27% followed by Germany (15%). Honey consumption average per capita is 0.20 kg/year. Countries in the world with the highest honey consumption per capita are Central African Republic (3.5 kg/year), Switzerland (1.5 kg/year), Greece (1.4 kg/year) and Turkey (1.3 kg/year). The most important problems related with beekeeping in Turkey can be listed as; productivity, quality and accordance with international standards.

Key words: beekeeping, development, production, foreign trade, Turkey

In recent years, beekeeping is an important branch of agricultural activity in the world which can be done using little capital without earthbound, brings income in a little while, and produces live materials and products such as queen bee, swarm bee, honey, beeswax, pollen, royal jelly, propolis and bee venom (Ozbek H., 2002). It is also a significant production branch providing an opportunity for work, income and healthy diet for rural population due to its low operational costs, low labor demand in comparison with other agricultural activities, that its products can be easily stored and that they can be sold at value. Honey bees play an important role in the actualization and continuity of plant production because of its role in pollination (Anonymous, 2003).

Today, beekeeping is a branch of animal husbandry considered important even for different purposes. Beekeeping activity is usually a traditional occupation in Europe and a tool to increase rural incomes in countries such as Spain, Poland, Hungary, Greece and Turkey. Regarding the countries in the Far East, Central and South

America, it is an important source for foreign income. It is mainly used for the purpose of pollination in plant production in countries such as the United States of America (USA), Canada and Japan (DPT, 2001).

Beekeeping is one of the oldest agricultural activities performed in the world. It made a stable progress across all countries in the world after especially honeybees passed the American and Australian continents. Advanced societies which know the importance of beekeeping widely use the valuable products derived from bees such as honey, beeswax, pollen, royal jelly, propolis and bee venom in many areas under the policy related to treatment with natural diet and natural products. In addition, the fact that productivity growth in cultivated crops depends on effective pollination emphasizes and promotes the beekeeping. With this structure, it is an essential sub-sector to continue with economic value (Korkmaz A., 2003).

Although Turkey has a favorable ecosystem and a strong production potential in terms of beekeeping activities, it is not yet in its intended

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position. Beekeeping in Turkey has a complex and dispersed structure and is seen as an additional source of income and a small family activity except a few top producers. Beekeeping activities in Turkey has not yet completed the process of institutionalization in public and private sectors (Gosterit A. and Gurel F., 2004). Despite government agencies identify several beekeeping and product standards, Turkish beekeeping sector and economy suffer due to the some circumstances. These are the inability of beekeepers to adequately organize, the attitudes of beekeepers in acting with the experience of old beekeepers, and to apply incorrect and/or incomplete control methods in the fight against bee pests. A standard system in Turkish beekeeping, which can be clearly defined in some respects such as beehive type, yield, the use of the queen bee, production of bee products and so on, has not been established (Cakmak I. *et al*, 2003). It will be provided that contribution to the economy will increase and beekeeping will remain as an indispensable activity in the future by developments being provided through the solution of the problems in Turkey's beekeeping sector.

The objectives of this study are to examine the current status and development of the beekeeping sector in Turkey and in the world, to identify the problems faced by the sector and to provide solutions for these problems. For this purpose, indicators such as honey production, the number of colonies, honey yield, honey consumption per capita, honey prices, exports and imports were compared for Turkey and the important countries in terms of beekeeping industry. Finally, key issues faced by the industry were identified and the solutions were offered.

MATERIAL AND METHOD

The main material of the study consisted of data and reports from the institutions such as Turkish Statistical Institute (TUIK), Food and Agriculture Organization of the United Nations (FAO), Ministry of Food, Agriculture and Livestock (GTHB), and State Planning Organization (DPT). It was also benefited from the previously conducted similar studies on the subject. The obtained data was arranged in accordance with the purpose, calculations were made, charts and graphs were created and interpreted.

RESULTS AND DISCUSSIONS

Today, beekeeping is one of the most common agricultural activities carried out all over the world. Beekeeping has become an emerging industry in the world with the understanding of the importance of products in terms of human health obtained from the bees such as beeswax, royal jelly, propolis, bee venom and notably honey. The development of the world colonial presence is given in Table 1. It is seen that the highest increase in the colonial presence is in Turkey when its development is examined in the major 10 honey-producing countries in the world. Whereas Turkey's colony presence was 4.2 million in average during the 2000-2002 period, it increased 59% reaching 6.6 million in 2013. The second major increase occurred in Ethiopia with 44% share. In the same period, world colony presence increased to 81 million from 72 million showing an increase around 13%. Turkey has suitable ecology, rich vegetation and different climatic zones in terms of beekeeping. Sources indicate that 10 482 different plants belonging to 8 792 species are in Turkey. Up to about 3000 of these plants are endemic (Davis P.H., 1982).

Table 1

Development of world colonial presence (1000 number)

Countries	2000-2002	2003-2005	2006-2008	2009-2011	2012	2013	Change (%)	Share (%)
China	15 098	16 130	17 142	17 693	17 852	17 920	18.69	22.12
India	9 800	9 800	10 067	11 200	11 550	11 600	18.37	14.32
Turkey	4 181	3 139	4 855	5 651	6 348	6 641	58.84	8.20
Ethiopia	3 649	4 256	4 907	4 908	5 207	5 250	43.88	6.48
Russia	3 466	3 356	3 150	3 024	3 250	3 284	-5.25	4.05
Iran	3 450	3 500	3 500	3 467	3 250	3 200	-7.25	3.95
Argentina	2 833	2 900	2 963	2 970	2 970	2 970	4.84	3.67
Ukraine	2 852	2 825	3 416	3 107	2 891	2 936	2.95	3.62
USA	2 569	2 519	2 345	2 560	2 624	2 640	2.76	3.26
Mexico	1 863	1 735	1 762	1 822	1 898	1 933	3.76	2.39
World	71 968	74 201	75 753	77 555	80 514	81 028	12.59	100.00

FAO, 2016.

Table 2

Development of world honey yield (kg/bee hive)

Countries	2000-2002	2003-2005	2006-2008	2009-2011	2012	2013	Change (%)
Mexico	31.64	31.63	32.37	31.02	30.87	29.44	-6.95
Argentina	30.12	30.46	29.02	22.11	26.94	26.94	-10.56
USA	34.02	31.57	30.11	27.83	24.60	25.69	-24.49
China	16.82	18.08	21.13	23.25	25.09	25.13	49.41
Ukraine	19.12	21.58	21.29	23.10	24.26	25.11	31.33
Russia	15.00	15.18	17.65	18.20	19.97	20.84	38.93
Turkey	15.61	23.97	16.42	15.18	14.05	14.26	-8.65
Iran	7.72	7.48	11.81	13.51	13.85	13.75	78.11
Ethiopia	9.35	8.98	9.20	9.18	8.82	8.57	-8.34
India	5.31	5.31	5.23	5.21	5.19	5.26	-0.94
World	17.68	18.47	19.77	20.08	20.08	20.53	16.12

FAO, 2016.

Considering the share of world colony presence for countries, it is identified that China, India and Turkey are among the top three. Their shares within the world colony presence are 22%, 14% and 8%, respectively. They meet around 44% of the world colony presence (*table 1*).

In the world beekeeping sector, the developments of honey yield for major countries are given in Table 2. In the examined period, it is determined that the largest increase in honey yield occurs in Iran, China, Russia and Ukraine. The increase in honey yield for the countries are 78%, 49%, 39% and 31%, respectively. There is a decline in the honey yield per beehive for the top three countries in terms of honey yield, Mexico, Argentina and the USA. In the same period, there is about 9% decrease in Turkey's honey yield. According to 2013 data, it is identified that Mexico has the highest honey yield per beehive (29 kg). It is followed by Argentina with 27 kg, the USA with 26 kg, and China and Ukraine with 25 kg.

Regarding Turkey, it is below the world average (21 kg) with the 14 kg of honey yield per beehive. Although Turkey is among the world's leading countries in terms of the number of colony, the most important reasons for the low honey yield per beehive in Turkey are social, agricultural and ecological changes in the structure, lack of technical knowledge and education, pests and diseases, the problems about breeding material and organization (Gosterit A. and Gurel F., 2004).

Honey is the first product that comes to mind when beekeeping is mentioned. The development of world honey production is given in Table 3. Whereas honey production in the world was 1.3 million tons during the 2000-2002 period, it increased by 31% reaching 1.7 million tons in 2013. China, Iran and Turkey have the highest increase in honey production in the same period. Honey production growths in these countries are 77%, 65% and 45%, respectively. Also, a decrease is observed in honey production in the USA,

Table 3

Development of world honey production (ton)

Countries	2000-2002	2003-2005	2006-2008	2009-2011	2012	2013	Change (%)	Share (%)
China	254 066	291 662	362 200	411 333	448 000	450 300	77.24	27.06
Turkey	65 278	75 268	79 713	85 787	89 162	94 694	45.06	5.69
Argentina	85 333	88 333	86 000	65 666	80 000	80 000	-6.25	4.81
Ukraine	54 542	60 963	72 733	71 757	70 134	73 713	35.15	4.43
Russia	51 993	50 945	55 591	55 047	64 898	68 446	31.64	4.11
USA	87 390	79 543	70 605	71 249	64 544	67 812	-22.40	4.08
India	52 000	52 000	52 666	58 333	60 000	61 000	17.31	3.67
Mexico	58 964	54 864	57 037	56 512	58 602	56 907	-3.49	3.42
Ethiopia	34 125	38 233	45 143	45 030	45 905	45 000	31.87	2.70
Iran	26 635	26 187	41 346	46 833	45 000	44 000	65.20	2.64
World	1 272 622	1 370 325	1 497 585	1 557 264	1 616 820	1 663 799	30.74	100.00

FAO, 2016.

Argentina and Mexico during the investigated period. It can be said that the decline in honey production arise from the decrease in honey yield.

When the share of honey production is examined for each country, China is ranked number one in the world with a share of 27%, whereas Turkey is ranked number two with a share of 6%. Turkey is followed by Argentina with a share of 5% (*table 3*). Although India is ranked second in the world colony existence, it is ranked seventh in terms of honey production due to having low honey yield per beehive.

Beeswax is also another important product in beekeeping sector. It is used as the main ingredient in the construction of honeycomb which is quite important in the development of modern beekeeping, besides being used as a raw material in many different fields such as cosmetic and pharmaceutical industries.

The share of top ten countries in world beeswax production is presented in Figure 1. Its production is about 64 777 tons in the world and

India is ranked first with a share of 36%. Regarding Turkey, it is ranked number four with a share of 6%.

According to 2013 data, 35% of honey produced in the world was exported. Whereas world honey export was 380 thousand tons during the 2000-2002 period, it increased by 53% reaching 583 thousand tons in 2013. The highest increase in honey export is seen in India, Belgium and Vietnam, while approximately 54% decrease occurs in Turkish honey export (*table 4*).

China is ranked number one in the world honey export with a share of 21% and is followed by Argentina (11%), Vietnam (6%), Mexico (6%) and India (5%). Turkey has about 1% share in the world honey export (3 564 tons) and the low export is due mostly to the fact that the majority of the produced honey is consumed domestically. The vast majority of Turkish honey was exported to the USA (71%) and Germany (17%) for the year 2015 (TUIK, 2016).

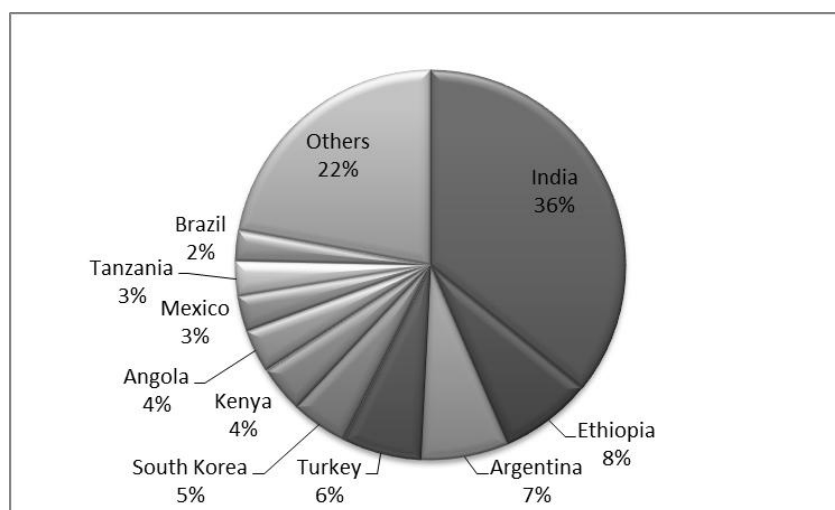


Figure 1 The share of top ten countries in world beeswax production (2013) (FAO, 2016)

Table 4

Development of world honey export (ton)

Countries	2000-2002	2003-2005	2006-2008	2009-2011	2012	2013	Change (%)	Share (%)
China	95 334	84 637	76 764	90 985	110 158	124 901	31.01	21.43
Argentina	80 495	80 235	84 362	62 547	75 135	65 180	-19.03	11.18
Vietnam	8 958	14 107	14 259	12 400	13 200	34 924	289.86	5.99
Mexico	29 498	22 472	28 677	26 794	32 040	33 458	13.42	5.74
India	3 797	11 362	11 985	21 633	24 515	30 099	692.70	5.16
Ukraine	1 647	3 881	4 447	7 539	13 338	21 674	1215.97	3.72
Spain	10 564	10 384	13 760	18 931	20 459	21 579	104.27	3.70
Germany	21 600	22 282	24 109	20 498	21 109	20 885	-3.31	3.58
Belgium	5 133	3 668	6 439	16 146	16 557	20 144	292.44	3.46
Hungary	13 518	16 525	22 498	13 520	14 535	18 365	35.86	3.15
Turkey	7 712	7 535	903	1 089	1 263	3 564	-53.79	0.61
World	380 055	403 917	426 653	455 012	517 633	582 912	53.38	100.00

FAO, 2016.

Table 5

Development of world honey export (1000\$)

Countries	2000-2002	2003-2005	2006-2008	2009-2011	2012	2013	Change (%)	Share (%)
China	85 964	93 258	115 597	169 861	215 051	246 550	186.81	12.12
Argentina	90 960	136 311	156 535	185 721	215 147	212 637	133.77	10.46
N. Zealand	7 396	19 970	38 066	64 794	103 985	140 091	1794.15	6.89
Germany	42 269	82 426	91 862	111 375	120 912	125 015	195.76	6.15
Mexico	42 634	52 397	62 874	85 447	101 497	112 352	163.53	5.52
Spain	21 232	33 220	44 648	75 396	82 109	92 385	335.12	4.54
Hungary	24 091	48 341	66 893	60 549	63 538	85 113	253.30	4.19
Vietnam	10 027	17 726	19 848	25 333	30 400	80 097	698.81	3.94
India	5 561	18 552	23 503	54 301	59 894	76 049	1267.54	3.74
Belgium	9 591	12 503	18 234	47 481	54 219	66 722	595.67	3.28
World	525 316	844 604	1 001 403	1 444 536	1 730 678	2 033 554	287.11	100.00

FAO, 2016.

The development of world honey export in value is presented in Table 5. While the world honey export value was \$525 million in the period 2000-2002, it reached nearly \$2 billion as showing an increase of 287% in 2013 (*table 5*). According to 2013 data, China ranks first in the honey export and is followed by Argentina, New Zealand, Germany and Mexico.

The development of world honey import is given in Table 6. In the analyzed period, the highest increase in honey imports occurs in Poland (583%). It is followed by Saudi Arabia (174%), Belgium (150%), the USA (85%) and France (79%). Turkish honey import is very insignificant. In the 2006-2008 period, Turkey performed 33 tons honey import on average.

The USA has the biggest share (27%) in world honey import and is followed by Germany (15%), Japan (7%), England (6%) and France (5%). It is seen that the honey import in quantity in the world is mainly performed in the EU countries (*table 6*).

The development of honey import in value for the top ten countries in the world is displayed in Table 7. In the studied period, a significant increase is found in the honey import for the EU countries presented in the table, the USA, Japan and Saudi Arabia except Turkey.

The USA has the highest share (25%) of world honey import in value and is followed by Germany (16%), England (6%), Japan (6%) and France (6%). It is seen that the honey import in value in the world is mainly performed in the EU countries (*table 7*).

The honey prices earned by producers in some countries in the world are given in Figure 2. The top three countries having the highest honey prices are Switzerland (18 \$/kg), Iran (16 \$/kg) and Turkey (11\$/kg).

The annual honey consumption per capita in 2011 is given in Figure 3. The highest honey consumption per capita in the world is in the

Table 6

Development of world honey import (ton)

Countries	2000-2002	2003-2005	2006-2008	2009-2011	2012	2013	Change (%)	Share (%)
USA	82 548	92 907	112 157	113 365	141 017	152 845	85.16	26.62
Germany	95 375	92 645	91 166	83 161	84 414	88 200	-7.52	15.36
Japan	41 767	44 660	39 880	39 151	36 823	39 030	-6.55	6.80
England	26 266	25 246	29 862	32 523	34 816	38 140	45.21	6.64
France	16 035	17 169	24 518	25 320	25 717	28 667	78.78	4.99
Belgium	9 726	7 252	11 562	20 578	20 814	24 354	150.40	4.24
Spain	13 097	13 298	15 210	17 876	21 161	22 095	68.70	3.85
Poland	2 952	4 509	4 313	10 075	14 173	20 156	582.79	3.51
Italy	12 840	14 623	12 643	14 958	15 221	18 489	44.00	3.22
S. Arabia	6 349	10 538	10 440	11 678	16 551	17 398	174.03	3.03
Turkey	401	264	33	-	-	-	-91.77	-
World	378 038	406 500	438 266	476 627	527 552	574 144	51.87	100.00

FAO, 2016.

Table 7

Development of world honey import (1000\$)

Countries	2000-2002	2003-2005	2006-2008	2009-2011	2012	2013	Change (%)	Share (%)
USA	112 691	169 197	198 365	312 340	415 980	497 886	341.82	24.73
Germany	125 632	212 595	197 619	271 907	281 680	313 458	149.50	15.57
England	34 918	67 060	86 308	111 721	113 805	125 974	260.77	6.26
Japan	45 628	61 483	71 652	101 571	105 432	116 357	155.01	5.78
France	26 729	49 130	69 494	96 669	93 753	112 616	321.33	5.59
Italy	19 316	36 637	32 424	54 293	56 089	75 207	289.35	3.74
S. Arabia	19 863	33 477	31 798	43 418	62 017	66 423	234.41	3.30
Belgium	15 108	21 092	27 854	51 137	55 798	63 438	319.90	3.15
Spain	15 023	26 969	30 511	40 285	48 447	53 047	253.11	2.64
Poland	3 062	6 619	10 824	28 515	34 961	48 224	1474.92	2.40
World	535 082	887 978	999 840	1 493 402	1 724 735	2 013 092	276.22	100

FAO, 2016.

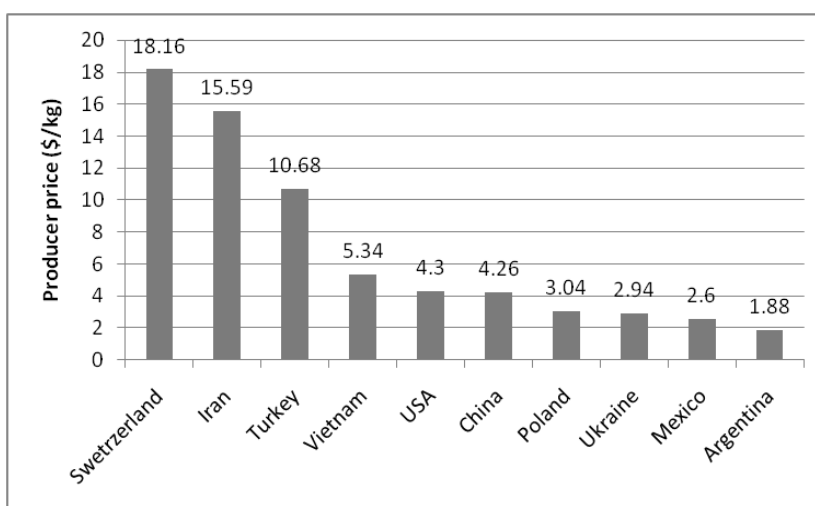


Figure 2 Honey producer price (2012) (FAO, 2016)

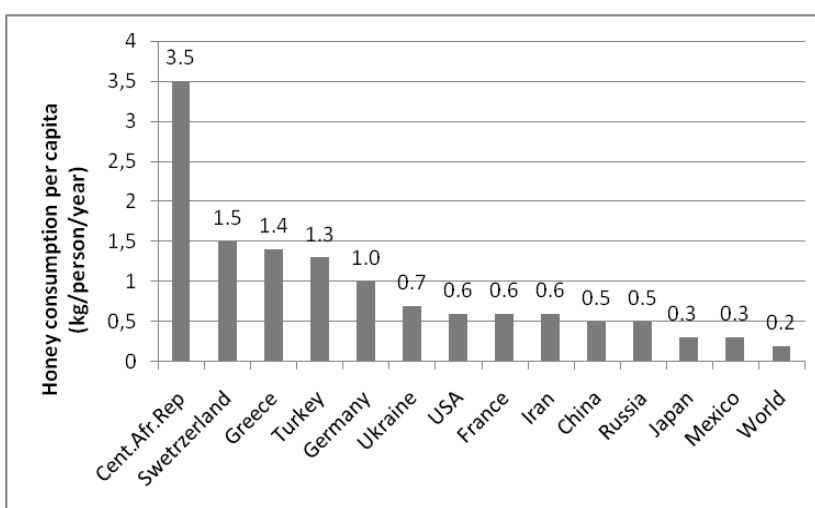


Figure 3 Honey consumption per capita in the world (2011) (FAO, 2016)

Central African Republic. The annual honey consumption per capita in the country is 3.5 kg. It is followed by Switzerland (1.5 kg/person/year), Greece (1.4 kg/person/year), Turkey (1.3

kg/person/year) and Germany (1 kg/person/year). The world average in annual honey consumption per capita is 0.2 kg. According to the data, Turkey ranks fourth in the world in terms of honey

consumption per capita and it is above the world average.

Beekeeping Support in Turkey

Beekeeping activities in Turkey are supported by different institutions of the state. Beekeeping sector in Turkey was supported by the Ministry of Food, Agriculture and Livestock for the first time in 2003. As of this date, support payments per queen bee have been made to the producers purchasing them from the queen bee producers who received the production permit from Turkish Associations of Beekeepers. The supports have been extended as the extracted honey premium and the bumblebee support, thereby improving their scope of supports since 2005. After the year 2008, it has changed over to the support application per beehive (Engindeniz, 2014).

Under the condition for registering beekeeping recording system in 2016 in Turkey, TL10 payments per full beehive are paid to the producers who are members of the beekeeping associations and have 30 full beehives. Also, TL60 payments per colony are provided to the beekeepers having bumblebees and being registered with the greenhouse recording system in order to ensure the natural pollination in greenhouses. In order to develop and protect the gene-pool in situ, TL40 payments are made per beehive. Also, the amount of supports given for the organic beekeeping is TL5 per full beehive (GTHB, 2016). These supports are provided by the Ministry of Food, Agriculture and Livestock.

The beekeeping activities in Turkey are also supported by Agriculture and Rural Development Support Agency (TKDK). The provision of consultancy services, which is required for feasibility studies, the purchase of essential machinery and equipment, and modernization of enterprises for producing, storing and processing of the beehive, honey and other bee products, are in the scope of support. For this purpose, 50% of the spending from €5 thousand to €250 thousand is given in the form of grants by TKDK (TKDK, 2016).

Beekeeping loans are given to the producers who have registered with Agricultural Bank of the Republic of Turkey (TCZB) beekeeping registration system, and have produced using at least 50 full beehives or have been willing to increase the number of full beehives to 50 and more. Interest rate on business and investment loans, which are granted to the producers in beekeeping sector, is subsidized by 50% (TCZB, 2016).

Problems of Beekeeping Sector in Turkey

Significant improvements have been achieved in the number of beehives and consequently in honey production in Turkey. However, the same development could not be achieved in the productivity due to some significant problems in beekeeping sector. They can be summarized as follows:

An effective organization system has not been established in beekeeping yet. The Beekeepers Association in Turkey has made substantial progress in organization. However, there is an organizational imperative for economical purposes because the aims of Turkish beekeeping are to increase the economic power and to ensure healthier production. With the current legal framework, it does not seem possible to achieve the aims alone for the Beekeepers Association. The agricultural organization comprises of cooperatives, agricultural chambers and producer associations. The cooperatives constitute farmers' economic field, the producer associations constitute the field of policy, guidance and lobbying, and the agricultural chambers establish the field of occupation serving as a bridge between the government and farmers. In this structure, it is quite significant that the duties and functions of the producer organizations complete each other (Firatli C. *et al.*, 2010).

Furthermore, uncontrolled and untimely use of pesticides in agricultural areas has reduced the nectar source for honeybees. This situation has caused a reduction in colony yields and also to practice more intensely migratory beekeeping (Firatli C. *et al.*, 2010).

There are some circumstances leading to unfair competition. These are honey is not classified according to the plants obtained in Turkey, to produce honey as giving intensive sugar syrup to the bees, to produce fake honey using commercial glucose and to put some sort of honey illegally from abroad to Turkey (Anonymous, 2013). Moreover, excessive and uninformed use of antibiotics and insecticides against diseases and pests cause major problems in export (Kalpaklioglu N., 2000).

Lack of technical information is in question in Turkish beekeeping. The beekeeping in Turkey is usually done with ancestral methods and unconsciously. Therefore, it is necessary to attach importance to training and extension activities for bee producers. Pesticides are used as untimely, unlicensed and unperformed dosage adjustment by producers. This situation also reduces the quality of honey while it endangers the life of bee colonies. It is very important to train beekeepers about fighting against diseases and parasites, and to conduct the inspection of their fight in this

regard. Producers should apply disinfectants in convenient dosage at the right time using licensed pesticides (Anonymous, 2013).

One of the most important problems in Turkey's beekeeping is the lack of breeder queens with superior genetic characteristics. Queen bee and bee material trade is still performed with traditional methods and a specific standard is not in question on this point. In order to solve the problem, the suitable breeding material for local conditions should be determined, and its production and distribution to the producers should be provided (Dogaroglu M., 2003).

Bumblebees which have larger structure and eye-catching colors comparing with honeybees are the most effective pollinators following the honeybees. Although the demand for bumblebees in greenhouse industry increases every day, dependency on foreign firms continues throughout the year in the mass production of bees. Solving the problems in mass production will enable domestic firms to enter the sector, to decrease in colony prices, and to export (Firatli *et al.*, 2010).

CONCLUSIONS

In the study, the current status and development of the beekeeping sector in Turkey and in the world were examined in the period 2000-2013. During this period, world colonial presence, honey yield per beehive and honey production increased by 13%, 16% and 31%, respectively. While an increase in the number of beehives was approximately 59% and in production was 45% in Turkey, around 9% decrease occurred in the honey yield per beehive in the same period. It is identified that honey yield per beehive in Turkey is lower than in the countries such as Mexico, Argentina, the USA and China, and the world average. Turkey ranks third in the world in terms of the number of beehives and second in terms of honey production. According to 2013 data, world honey export is about 583 thousand tons and Turkey's share is around 1% while China is placed on top with 21% share. Turkey's honey export remains at low levels because the majority of the produced honey is consumed domestically. The annual honey consumption per capita in Turkey is 1.3 kg on average and therefore it is higher than the world average and many EU countries. There are serious problems hindering the development of the beekeeping industry in Turkey. These are marketing, producer organization, lack of producers' technical knowledge, failure of the breeding material production, diseases and pests

in the beehive, and foreign-source dependency in bumblebees supply. In case of solving these issues, the contribution of the beekeeping sector to the national economy will increase in Turkey.

REFERENCES

- Anonymous, 2003** – *Adana Agriculture Master Plan. Support Project for Preparation of Provincial Agriculture and Rural Development Master Plan, Republic of Turkey Ministry of Agriculture and Rural Affairs*, Adana Directorate of Provincial Agriculture, Adana (in Turkish).
- Anonymous, 2013** – *Beekeeping, Ordu Commodity - Exchange*, [http://www.ordutb.org.tr/pdf/aricilik_son\(_2013\)\(1\).pdf](http://www.ordutb.org.tr/pdf/aricilik_son(_2013)(1).pdf), Accessed: 30 June 2016 (in Turkish).
- Cakmak, I., Aydin, L., Seven, S., Korkut, M., 2003** – *Beekeeping Survey in Southern Marmara Region of Turkey*. Uludag Bee Journal, February 2003, Bursa (in Turkish).
- Davis, P.H., 1982** – *Flora of Turkey and East Aegean Islands*. Edinburg Univ. Pres. Vol. 7, 947pp.
- Dogaroglu, M., 2003** – *Significant Issues Affecting Productivity and Solutions in Turkish Beekeeping*. II. Marmaris Beekeeping Congress, Yalova (in Turkish).
- DPT, 2001** – *Eighth Five-Year Development Plan, Livestock Special Commission Report, State Planning Organization*, Ankara (in Turkish).
- FAO, 2016** – Food and Agricultural Organization of the United States database, <http://www.fao.org>, Accessed: 15 April 2016.
- Firatli, C., Karacaoglu, M., Gencer, H.V., Gurel, F., Koc, A.U., 2010** – *Structural Analysis of Turkish Beekeeping. TMMOB Chamber of Agricultural Engineers, Turkey Agricultural Engineering VII. Technical Congress*, 11-15 January 2010, p. 707-717, Ankara (in Turkish).
- Gosterit, A., Gurel, F., 2004** – *The Structure of Beekeeping of Turkey and Possibilities of Sustainable Beekeeping*. 4. National Animal Science Congress, Volume: 2, 1-3 September, 2004, Isparta (in Turkish).
- GTHB, 2016** – Ministry of Food, Agriculture and Livestock, <http://www.tarim.gov.tr>, Accessed: 29 June 2016.
- Kalpakioglu, N., 2000** – *The Problems Encountered in Honey Production and Its Effect on the Country's Exports*. Turkey 3. Beekeeping Congress, Adana (in Turkish).
- Korkmaz, A. 2003** – *Beekeeping*. Ministry of Agriculture and Rural Affairs Samsun Provincial Directorate of Agriculture, Samsun (in Turkish).
- Ozbek, H., 2002**. *Bees and Nature*. Uludağ Bee Journal, 3(2): 22-25 (in Turkish).
- Engindeniz, S., Ucar, K., Basaran, C., 2014** – *Economic Aspects and Problems of Beekeeping in Izmir, Turkey*. Agricultural Economics Journal, 20(2): 113-120 (in Turkish).
- TCZB, 2014** – Republic of Turkey Agricultural Bank, <http://www.ziraat002Ecom.tr> Accessed: 29 June 2014.
- TKDK, 2014** – Agriculture and Rural Development Support Agency, <http://www.tkd.gov.tr>, Accessed: 15 June 2016.
- TUIK, 2016** – Turkish Statistical Institute, <http://www.tuik.gov.tr>, Accessed: 12 May 2016.