

THE DEVELOPMENT, PROBLEMS AND SOLUTION PROPOSALS OF LAYING HEN SECTOR IN TURKEY

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This paper introduces the current situation and future development of the laying hen sector in Turkey, identifying and offering solutions to sectoral problems. Egg production in Turkey was 384 930 tonnes in 1990, and increased by 92.25% to 740 024 tonnes in 2010. Although annual egg consumption in Turkey exceeds the world average (8.9 kg/person/year) it would be right to state that it is not at the optimum level in comparison with the developed countries. In 2010, Turkey ranked 6th, with egg exports valued at approximately 156.2 million dollars. Turkey's primary export market is Iraq, representing almost 72%. It has been calculated that the increase in the retail price of an egg was at about 50% and increase in the production cost of an egg was 71.11% in the period of 2007–2011. The principal problems of the laying egg sector in Turkey are: high costs, breeding animal, feed, external dependence on vaccine and medicine, epidemics, the lack of any production planning and inefficient consumption of egg products.

Key words: laying hen; egg production; trade; consumption; problems

РАЗВОЈ, ПРОБЛЕМИ И ПРЕДЛОЗИ ЗА РЕШЕНИЈА КАЈ НЕСИВАТА ЖИВИНА ВО ТУРЦИЈА

Овој труд не воведува во тековната состојба и идниот развој на секторот за јајценосно производство во Турција, идентификација и нудење решенија за секторските проблеми. Производството на јајца во Турција изнесува 384.930 тони во 1990 год., и бележи пораст од 92,25%, односно 740.024 тони во 2010 год. Иако годишната потрошувачка на јајца во Турција го надминува светскиот просек (8,9 кг/човек/годишно), со право може да се констатира дека не е на оптимално ниво во споредба со развиените земји. Во 2010 год., Турција е рангирана на 6-то место, со извоз на јајца во вредност од околу 156,2 милиони долари. Турција главно извезува на ирачкиот пазар, што преставува речиси 72%. Пресметано е дека зголемувањето на малопродажната цена на јајцата, беше околу 50%, а трошоците за нивно производство се зголемиле за 71.11% во периодот од 2007–2011. Главните проблеми поврзани со секторот за јајценосно производство во Турција се: високите трошоци, одгледувањето на живината, храната, надворешната зависност од вакцини и медицина, епидемии, немање планирано производство и недоволна потрошувачка на производи од јајца.

Клучни зборови: несилка; производство на јајца; производство; трговија; потрошувачка; проблеми

INTRODUCTION

The development of the poultry sector, including the production of chicken eggs and meat, began in the 1970s in Turkey, and arrived at today's modern, qualified and sustainable structure of production through the widespread adoption of integrated and contracted business models up until the 1990s (Sungur, 2012a). The poultry sector is regarded as the most developed branch of livestock production in Turkey. The levels of production achieved for chicken eggs and meat parallel those of developed countries. The poultry sector also benefits from utilising the same level of technology as that in developed countries. The same is

valid for a great number of factors such as shelters, hatcheries, slaughterhouses, and feed units, as well as maintenance and management. In terms of scale, the sector includes 5 000 egg-production businesses, each of 10 000 broilers. It is estimated that the poultry sector employs approximately 2 million people (SPO, 2007). The annual turnover of the sector exceeds 3 billion dollars (Sungur, 2012a). Poultry sector occupies a principal place in the animal production activities in terms of its meeting the animal protein deficit, enabling to intensive stock farming, the productivity in the breeding and feeding thanks to the scientific developments, its contribution to the rural development as well as it does not need larger space. A capacity of 10 000

broilers can be described as a “business”, and the Turkish poultry sector includes 5 000 such egg production businesses.

Poultry provides an important proportion of dietary animal protein. Daily consumption of protein is 102 g per person in developed countries, of which 70 g is of animal origin. However, daily consumption of protein is 84 g in Turkey, of which 17 g is of animal origin. Annual consumption of flour in Turkey is 320–325 kg/person whereas it changes between 70–110 kg in developed countries. The figures show that Turkish people consume three times more flour than those in developed countries, and three or five times less animal protein. This highlights the deficit in the intake of animal protein, and the corresponding importance of the domestic poultry sector (Sungur 2012a).

The objective of this study is to introduce the current situation and the development of the laying hen sector in Turkey, and to identify and offer solutions to problems within the sector. To this aim, Turkey is compared with leading countries in the poultry sector according to indicators such as egg production, egg consumption per capita and egg imports and exports. Egg production cost and egg price are compared in Turkey, and changes in feed prices are examined. In addition, the information was given about egg marketing channel and the

functions of intermediaries in this channel. Finally, new trends and significant problems within the sector are identified, and potential solutions are offered.

MATERIAL AND METHOD

The principal material of the study comprises data and reports of the Turkish Statistical Institute (TÜİK), Food and Agriculture Organization (FAO), Ministry of Food, Agriculture and Live-stock of the Republic of Turkey, United Nations Commodity Trade (UN Comtrade) and Turkish Egg Producers Association. In addition, this study benefited from previous similar studies. The relevant data are presented in tables.

RESULTS AND DISCUSSION

Global developments in egg production

Table 1 shows developments in egg production within leading producer countries. There has been a significant increase in global egg production between 1990 and 2010.

Table 1

Developments in global egg production

Countries	Egg production (ton)						Index		
	1990	%	2000	%	2010	%	1990	2000	2010
China	6560750	18.61	18911888	36.93	23827390	37.48	100	288.26	363.18
USA	4034000	11.44	4998300	9.76	5411600	8.51	100	123.90	134.15
India	1161000	3.29	2035000	3.97	3414000	5.37	100	175.28	294.06
Japan	2419000	6.86	2535440	4.95	2515000	3.96	100	104.81	103.97
Mexico	1009800	2.86	1787940	3.49	2381380	3.75	100	177.06	235.83
Russian Federation	4581700	13.00	1894600	3.70	2260600	3.56	100	41.35	49.34
Brazil	1230400	3.49	1509460	2.95	1948000	3.06	100	122.68	158.32
Indonesia	364400	1.03	642000	1.25	1117800	1.76	100	176.18	306.75
Ukraine*	–	–	496567	0.97	973900	1.53	–	100	196.13
France	886800	2.52	1038000	2.03	946600	1.49	100	117.05	106.74
Spain	666640	1.89	657552	1.28	840000	1.32	100	98.64	126.01
Iran	295000	0.84	579000	1.13	741000	1.17	100	196.27	251.19
Turkey	384930	1.09	810000	1.58	740024	1.16	100	210.43	192.25
Italy	655900	1.86	686100	1.34	736800	1.16	100	104.60	112.33
Germany	985000	2.79	901000	1.76	664268	1.04	100	91.47	67.44
Netherlands	652000	1.85	668000	1.30	631000	0.99	100	102.45	96.78
United Kingdom	622270	1.77	568600	1.11	619000	0.97	100	91.38	99.47
Thailand	449100	1.27	514563	1.00	585500	0.92	100	114.58	130.37
Poland	422375	1.20	423745	0.83	618496	0.97	100	100.32	146.43
World	35248892	100	51213750	100	63571536	100	100	145.29	180.35

FAO, 2012

Global egg production was 35 248 892 tonnes in 1990, which increased by 80.35% to 63 571 536 tonnes in 2010. The biggest increase was observed in China production, which increased by 3.6 times during the period analysed. Following China, the countries that achieved the biggest increases in egg production are Indonesia (3.1 times increase), India (2.9), Iran (2.5), and Mexico (2.4). Over the same period, egg production in Turkey increased by 92.25%, from 384 930 tonnes in 1990 to 740 024 tonnes in 2010. Over the same period, egg production declined in the Russian Federation, Germany, Holland, and the United Kingdom. According to 2010 data, China produces the greatest proportion of global egg production (37.48%), followed by the USA (8.51%) and India (5.37%); Turkey is ranked 13th in the world, with 740 024 tonnes.

World Egg Consumption

As one of the principal human foods of animal origin, eggs represent an important component in adequate and balanced nutrition. The consumption of 2 eggs daily meets approximately half the requirement for animal-origin protein. The world average and the annual egg consumption for some countries are given in Table 2.

Table 2

Egg consumption by countries

Countries	Egg consumption (kg/person/year)	Countries	Egg consumption (kg/person/year)
World	8.90	Poland	11.30
Japan	19.10	Norway	11.00
China	18.50	Argentina	10.80
Mexico	18.10	Korea	10.80
Denmark	16.80	Switzerland	10.70
Ukraine	15.60	United Kingdom	10.30
Hungary	14.80	Bulgaria	9.90
Russ. Federation	14.60	Czech Republic	9.90
France	14.30	Greece	9.60
USA	14.10	Israel	9.60
Spain	14.00	Turkey	9.40
Austria	13.60	Kazakhstan	8.40
Uruguay	13.10	Brazil	8.00
Italy	12.70	Turkmenistan	8.00
Romania	12.50	Macedonia	7.80
Germany	12.20	Iran	7.70
Canada	12.00	Azerbaijan	7.50
Sweden	11.50	Tunisia	7.50

FAO, 2012

Annual egg consumption is almost 8.9 kg/person according to data from 2009. The table shows

that egg consumption is high in countries such as Japan, China, Mexico, Denmark, Ukraine, Hungary, Russian Federation, France, the United States of America and Spain. Although annual egg consumption in Turkey exceeds the world average, it is still not at the optimum level when compared to that of developed countries. Daily egg consumption per capita is less than the world average in countries such as Kazakhstan, Brazil, Turkmenistan, Macedonia, Iran, Azerbaijan, and Tunisia.

Promotional campaigns should be conducted on the nutritional importance of eggs, with a view to encouraging egg consumption. Nevertheless, publications are not sufficient enough on their own, campaigns should be arranged for messages to be more effective and will contribute to increasing egg consumption.

World Egg Trade

Table 3 shows data for the top-20 egg exporting countries. According to the data from 2009, Holland is ranked first, with 396 445 tonnes, Poland, China and Spain followed respectively, representing 24.12%, 8.65%, 8.19%, and 7.59% of exports in terms of number of eggs. Turkey is ranked 7th in the world, with egg exports of 89 644 tonnes.

Table 3

Top-20 egg exporting countries

Countries	Quantity (ton)	(%)	Value (1000 \$)	(%)
World	1643697	–	2856961	–
Netherlands	396445	24.12	782153	27.38
Poland	142143	8.65	207803	7.27
China	134659	8.19	106956	3.74
Spain	124707	7.59	181950	6.37
Germany	106319	6.47	230307	8.06
Malaysia	97863	5.95	88460	3.10
Turkey	89644	5.45	126618	4.43
USA	85458	5.20	238257	8.34
Belgium	69558	4.23	124070	4.34
France	50551	3.08	117258	4.10
India	44180	2.69	48751	1.71
Ukraine	35514	2.16	42344	1.48
Belarus	31519	1.92	28967	1.01
Thailand	22462	1.37	25893	0.91
Italy	19075	1.16	46895	1.64
Hungary	12967	0.79	37587	1.32
Brazil	10035	0.61	35764	1.25
Czech Republic	9446	0.57	25434	0.89
United Kingdom	7016	0.43	47533	1.66
Canada	1920	0.12	31461	1.10

FAO, 2012

In 2009 world egg exportation is approximately 2.86 billion \$. Netherlands is ranked first followed by the USA, Germany and Poland respectively, representing 27.38%, 8.34%, 8.06%, and 7.27% of world egg export value. Turkey is ranked 6th in the world, with approximately 126.62 million \$ egg export and represents 4.43% of the world egg export value.

The top 20 egg importing countries are shown in Table 4. According to the data from 2009, Germany is ranked first, and imports 427 373 tonnes of eggs. Germany is followed by France (143 351 tonnes), Holland (121 578 tonnes) and Iraq (106 071 tonnes). These four countries represent 28.53%, 9.57%, 8.12%, and 7.08% of global egg imports, in terms of number of eggs.

Table 4

Top-20 egg importing countries

Countries	Quantity (ton)	(%)	Value (1000 \$)	(%)
World	1497830	–	2783553	–
Germany	427373	28.53	798623	28.69
France	143351	9.57	115593	4.15
Netherlands	121578	8.12	196247	7.05
Iraq	106071	7.08	144126	5.18
Hong Kong	91880	6.13	120847	4.34
United Kingdom	48258	3.22	107299	3.85
Belgium	43475	2.90	89743	3.22
Switzerland	33562	2.24	71448	2.57
Poland	27798	1.86	52900	1.90
Canada	27696	1.85	56322	2.02
Italy	23446	1.57	46712	1.68
Austria	22466	1.50	45963	1.65
Czech Republic	17253	1.15	30321	1.09
Denmark	16112	1.08	30544	1.10
Hungary	14981	1.00	28139	1.01
Romania	14655	0.98	31586	1.13
Singapore	12043	0.80	91705	3.29
Russian Federation	11973	0.80	65874	2.37
Libya	8539	0.57	50016	1.80
Ukraine	5626	0.38	29449	1.06

FAO, 2012

In 2009 the total egg import value in the world is approximately 2.78 billion \$. Germany is ranked first followed by Netherlands, Iraq and Hong Kong respectively, representing 28.69%,

7.05%, 5.18%, and 4.34% of the world egg import value.

The Number of Laying Hens in Turkey and Developments in Egg Production

Table 5 shows developments in the number of laying hens in the period from 1991 to 2009 in Turkey. The total number of laying hens was 50 826 656 in 1991, which increased by 30.84% to 66 500 461 in 2009. According to 2009 data, the city of Afyon has the highest number of laying hens in Turkey, at 14.11%. Afyon is followed by Konya (13.12%), Balıkesir (8.02%), Manisa (8.01%) and Çorum (5.81%).

Table 6 shows developments in egg production in some principal Turkish cities during the period from 1991 to 2009. The city of Konya is ranked first, with 14.10% of egg production in Turkey. Konya is followed by Afyon (13.76%), Balıkesir (9.28%) and Manisa (8.09%). During the study period, egg production increased by 5.8 times in Konya, by 2.5 times in Balıkesir and 2.6 times in Manisa.

Developments in the Egg Trade in Turkey

Table 7 shows significant developments in Turkish import and export of eggs between 1990 and 2010. Turkish egg exports were 2700 tonnes in 1990, which increased by 4774 times to 131 610 tonnes in 2010. Turkish egg exports in 2010 were worth approximately 156.2 billion dollars. It is seen that Turkish egg imports remain very low, at 848 tonnes in 2010.

Table 8 shows the leading countries to which Turkey exports eggs. Iraq is the largest export market for the Turkish egg sector, at 94 539 tonnes (71.83% of total exports) in 2010. Syria is also an important market, representing 20.76% of Turkish exports.

The developments in the Egg Price and Production Cost in Turkey

Figure 1 shows developments in the price of hen food in Turkey between 2006 and 2011. The price of hen food was 400.83 Turkish Lira/tonne in 2006, and doubled to 806.67 TL/tonne in 2011. Animal feed represents an important proportion of production costs in the laying hen sector. Demircan et al. (2010) reported that the cost of food represented between 61% and 69% of production costs, according to the size of the company. Hence, the rapid increase in the feed price negatively affects egg producers.

Table 5

Developments in the number of hens in some important provinces in Turkey

Provinces	Number of hens			The share in Turkey (%)	Index (1991=100)		
	1991	2000	2009		1991	2000	2009
Afyon	3240040	4102500	9382179	14.11	100	126.62	289.57
Konya	2128094	9208300	8723304	13.12	100	432.70	409.91
Balıkesir	2774190	5272000	5334806	8.02	100	190.04	192.30
Manisa	2375285	2931000	5324684	8.01	100	123.40	224.17
Çorum	1944050	2491700	3864377	5.81	100	128.17	198.78
İzmir	3175480	2830900	3531263	5.31	100	89.15	111.20
Kayseri	1061560	1292200	3238910	4.87	100	121.73	305.11
Ankara	884168	1229750	3071717	4.62	100	139.09	347.41
Bursa	1880192	2075500	1933380	2.91	100	110.39	102.83
Denizli	801150	995000	1715344	2.58	100	124.20	214.11
Samsun	1201030	1524900	1286778	1.93	100	126.97	107.14
Karaman	333180	2293100	1082281	1.63	100	688.25	324.83
Yozgat	559374	1306700	1023004	1.54	100	233.60	182.88
Amasya	439431	388800	1012423	1.52	100	88.48	230.39
Eskişehir	405560	354010	1009915	1.52	100	87.29	249.02
İstanbul	1483514	567420	983526	1.48	100	38.25	66.30
Mersin	641992	788000	971900	1.46	100	122.74	151.39
Muğla	683100	813900	879923	1.32	100	119.15	128.81
Nevşehir	398840	756000	810800	1.22	100	189.55	203.29
Sakarya	804300	1139000	810345	1.22	100	141.61	100.75
Total of Turkey	50826656	64709040	66500461	–	100	127.31	130.84

TUIK, 2012

Table 6

Developments in egg production in some important provinces in Turkey

Provinces	Egg production (1000 unit)			The share in Turkey (%)	Index (1991=100)		
	1991	2000	2009		1991	2000	2009
Konya	336390	2188403	1950274	14.10	100	650.56	579.77
Afyon	732090	1025915	1903593	13.76	100	140.14	260.02
Balıkesir	513583	1093255	1283147	9.28	100	212.87	249.84
Manisa	423440	871345	1119417	8.09	100	205.78	264.36
İzmir	630504	737643	815371	5.89	100	116.99	129.32
Ankara	141339	257566	695057	5.02	100	182.23	491.77
Kayseri	220514	272652	665314	4.81	100	123.64	301.71
Çorum	410738	615420	638143	4.61	100	149.83	155.36
Bursa	248985	434167	434085	3.14	100	174.37	174.34
Denizli	108062	217970	322673	2.33	100	201.71	298.60
Eskişehir	54237	61842	243693	1.76	100	114.02	449.31
Karaman	30453	569324	242038	1.75	100	1869.52	794.79
Samsun	211977	302987	213755	1.55	100	142.93	100.84
Amasya	46472	59666	202143	1.46	100	128.39	434.98
Yozgat	43407	253055	201701	1.46	100	582.98	464.67
İstanbul	302762	116114	193542	1.40	100	38.35	63.93
Sakarya	118471	172013	192434	1.39	100	145.19	162.43
Nevşehir	56782	180058	162065	1.17	100	317.10	285.42
Aydın	248071	192664	156344	1.13	100	77.66	63.02
Kocaeli	290284	282718	138246	1.00	100	97.39	47.62
Total of Turkey	7667990	13508586	13832726	100.00	100	176.17	180.40

TUIK, 2012

Table 7

Developments of egg exports and imports in Turkey

Years	Exports				Imports			
	Quantity (ton)	Index	Value (1000\$)	Index	Quantity (ton)	Index	Value (1000\$)	Index
1990	2700	100.00	4062	100	277	100.00	701	100.00
2000	3556	131.70	3629	89.34	1977	713.72	2988	426.23
2010	131610	4874.44	156195	3845.27	848	306.14	11591	1653.50

UNCOMTRADE, 2012

Table 8

Turkish egg exports by countries

Countries	Quantity (ton)	%	Value (1000\$)	%
Iraq	94539	71.83	108672	69.57
Syria	27320	20.76	30357	19.44
Israel	5772	4.08	7136	4.57
Azerbaijan	1291	0.98	4757	3.05
Other countries	3087	2.35	5273	3.38
Total	131610	100.00	156195	100.00

UNCOMTRADE, 2012

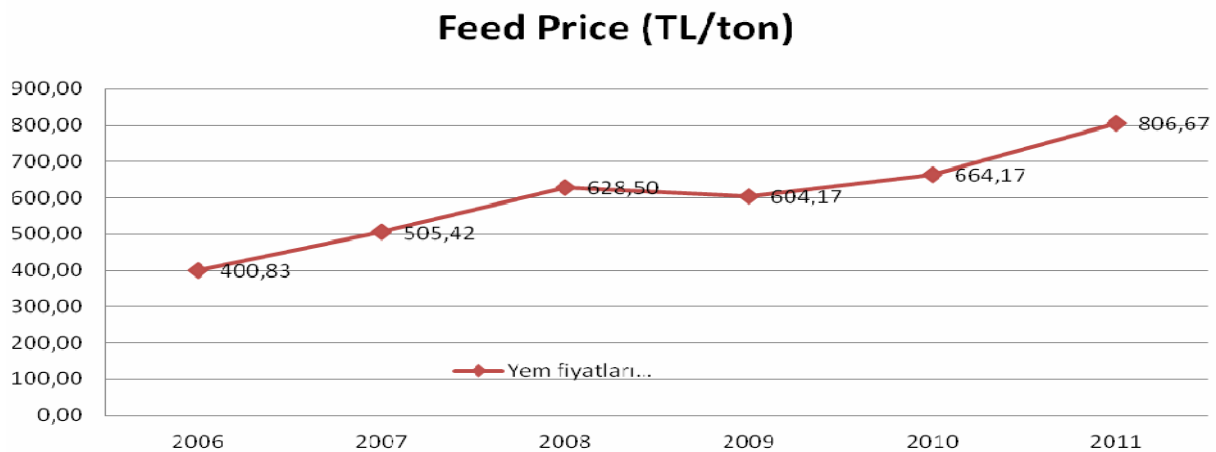


Figure 1. Change of feed price in laying hen sector
 USD = 1.67 TL in 2011 (average) Türkiye (Bir, 2012)

Table 9 compares the egg price and egg production cost in Turkey between 2007 and 2011. The egg price was 0.18 TL in 2007, and increased by approximately 50% to 0.27 TL in 2011. The egg production cost was previously 0.09 in 2007; this increased by approximately 71.11% to 0.154 TL in 2011. According to the data, the increase in

the production cost was greater than the increase in the egg price. However, in the examined period, the egg price was higher than the egg production cost. Nevertheless, the profit margin has been subjected to change during the years and differentiated between 0.08 TL/item and 0.116.

Table 9

Comparison of egg price and egg production cost in Turkey

Years	Egg price (TL/egg)*	Index (2007=100)	Egg production cost (TL/egg)**	Index (2007=100)	Profit margin (TL/unit)
2007	0.18	100.00	0.090	100.00	0.090
2008	0.19	105.56	0.110	122.22	0.080
2009	0.21	116.67	0.121	134.44	0.089
2010	0.20	111.11	0.132	146.67	0.068
2011	0.27	150.00	0.154	171.11	0.116

*TÜİK, 2012; **Yum-Bir, 2012 1 USD = 1.67 TL in 2011 (average)

The Egg Marketing Channel

Final products go through several steps before they are offered to customers, and are processed via different ways. Paths and places where products cross with different operations of production collectively are called marketing channel (Yurdakul, 2002). The marketing channels for products may change, depending on the product itself. Figure 2. shows the egg marketing channels in Turkey. Eggs produced in the laying hen sector are marketed through wholesalers, industrialists, ex-

porters and supermarkets. Wholesalers convey the products that they purchase from producers to the consumers, either by means of retailers or via neighbourhood markets and grocers. Industrialists purchase eggs from producers, and process them in many ways before supplying a range of egg-based products to retailers, who then market these to consumers. Egg producers also market eggs directly to supermarkets in the domestic market, and may also export their produce.

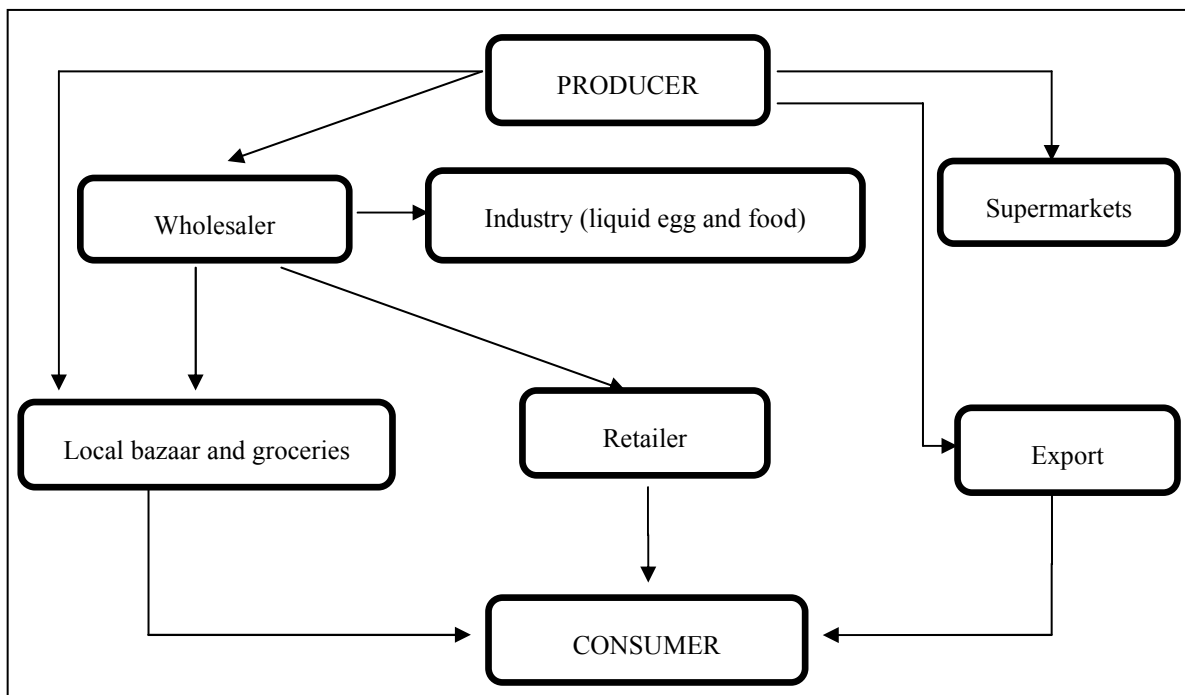


Figure 2. Marketing channels for eggs and egg-based products (Sungur, 2012b)

The Problems of the Laying Hen Sector and Potential Solutions

Although there have been significant improvements in the laying hen sector, such as capac-

ity and production infrastructure, the sector still faces some challenges. These problems and potential solutions are listed below:

The cost of animal feed comprises an important part of egg production cost. Due to inadequate production in Turkey especially of soybean and maize which have been used as a feed raw material, these raw materials have been fulfilled by importation. Furthermore, there is a dependency on foreign countries in terms of material for breeding, vaccine and medicine. Any increase in the price of these inputs also increases the egg production cost in Turkey, and negatively affects the international competitiveness of the sector. One solution might be to increase the subsidy for soybean and corn in Turkey, in order to increase domestic production.

Another substantial problem is epidemics in the laying hen sector. Exports have been badly affected by the newcastle disease salmonella, and the inefficient residual monitoring program for eggs. The exporting situation may be healed by taking precautions like giving crop insurance to epidemics, launching a nation-wide program in order to lessen the incidence of Salmonella, and efficient implementation of the residual monitoring program on eggs in accordance with the EU criteria.

The lack of control over storage of poultry manure causes major environmental pollution and threatens the bio safety of henhouses. The use of poultry manure, both as fertiliser in plant production or in the production of biogas, will contribute to addressing such problems, and will also provide a significant source of revenue.

Egg consumption per capita is lower in Turkey than in developed countries. The development of publicity programs and campaigns on importance of eggs in human health may be useful in increasing consumption of eggs.

The value-added-tax (VAT) implemented on eggs and raw materials for the feed is 8%. The rate of the value added tax should be at 1% level in order to increase egg consumption and also reduce the cost of animal feed.

The lack of any planning in egg production and the instability between supply and demand may lead to fluctuations in egg prices and negatively affect producers. Egg-production capacity should be increased, pursuant to the level of domestic egg consumption and exports. The egg sector and the Ministry of Agriculture should collaborate to plan production levels in order to prevent excess supply.

CONCLUSION

Turkey has recently achieved many improvements in the poultry sector, in terms of number of hens, production, production technologies and marketing organization. Traditional village poultry has been replaced by the commercial and industrial poultry. Turkey is ranked 13th in terms of global egg production (740 024 tonnes) and 7th in egg exports (89 644 tonnes). Annual per capita egg consumption is 9.4 kg in Turkey, which is regarded as being low compared to developed countries.

Despite all of the positive improvements, the poultry sector still faces several problems. The main problems are high production costs, breeding, raw material for the food, external dependence on vaccines and medicine, epidemics, the lack of production planning and inefficient egg consumption. Identifying solutions to these problems will further increase the contribution of the poultry sector to the Turkish economy.

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