COMPETITIVENESS AND SUSTAINABLE DEVELOPMENT OF AGRI-FOOD SECTOR

КОНКУРЕНТОСПОСОБНОСТ И УСТОЙЧИВО РАЗВИТИЕ НА АГРОХРАНИТЕЛНИЯ СЕКТОР

Sustainable development of agri-food sector in Turkey

Устойчиво развитие на земеделския и хранителния сектор в Турция

Introduction

"The agri-food industry" is an industry based on the production, processing, preparation and packaging of food products for the consumption of people in a basic sense. Raw materials of this industry are provided from agriculture, livestock and fisheries sectors [1]. Classifications such as ISIC, CPC and HS are used to identify and define the agro-industry. There are some differences between these classifications, the scopes of classifications are being updated over time, and the issue continues to be discussed in detail [3]. Discussion about which groups have to be added or removed, especially in classes, are intensive and up-to-date. For this reason, different types of classification are used in different studies. Likewise, similar debates continue for the agri-food industry context. For this reason, different approaches to the issue are seen in the international literature.

According to one of these approaches, the "agri-food industry" includes final products from the agriculture, livestock, forestry and fisheries sectors and products produced by the food industry (food, beverages and tobacco products) [4]. In another study, primary agriculture, forestry and fishery products and food, beverage, fish and wood processing industries are included in the "agri-food industry" [5]. In the case of the Philippines, food, beverages, tobacco and rubber products were taken under the "agri-food industry" [6]. A study in Canada includes “the agri-food industry”, the agricultural sector, the food, beverage and tobacco processing industry, food wholesaling and retailing, and even the food service industry [7]. Another study in the same country “the agri-food industry” includes primer production in the agriculture sector and in the fisheries sector and processing of food and beverages [8].

According to the international literature, the scope of the "agri-food" concept may differ for the purpose of the intended study, the country in which it is realized, and the time it is being implemented.

The aim of this study was to evaluate the agri-food sector in Turkey and examine the macro data related to the sector. Thus, the development of the sector in recent years and the determination of the strengths and weaknesses of the sector have been aimed. Besides, the measures that can be taken in terms of sector sustainability and the works to be done have been discussed.

Material and Method

The material of the study is the secondary data obtained from the sources of the subject. As stated in the introduction, the scope of the concept of "agri-food" can be expressed in different ways in different studies in different countries, in accordance with the stated aims and the conditions of the countries. In this study, in line with this approach, taking into account the conditions of Turkey, "agri-food sector" has been studied in two main sections, including agriculture sector and food and beverage industry.

Macro data on the "agri-food sector" has been examined in the minimum 15-year time series, where data are available, taking into account annual changes. Macro data obtained from TURKSTAT and other institutions were converted to US dollars from the local currency (Turkish Lira), using the average exchange rates indicators. In addition, SWOT analysis has been carried out by evaluating the studies that have already been done to reveal the sustainability of the sector.

Agri-food Sector's Importance for Turkey

The importance for Turkey of the sector is very large due to providing of food for the population, providing raw materials to agro-industry, creating demand for industrial products and its contribution to national income and exports [9].

Generally, when agriculture sector integrates successfully with the industry sector, significant benefits are created for producers, agro-industries and the country's economy. For producers, there are important benefits such as providing some basic inputs on time, guaranteeing to sell products at a certain price, reducing risk in production, reducing costs, acquiring bargaining power, adaptation of new technologies, capital funding. For agro-industries, it is possible to find raw materials in desired quantity, amount and on time and fluctuations in production can be reduced. From the point of view of the country economy, it can be said that the added value increase, the transfer of the excess population in agriculture sector to the industry sector and the improvement of the income distribution can be mentioned [9].

In the first years of the establishment of the Republic of Turkey, agri-food sector had enormous significance for the country and the state that was the main sector for the economic development of the country. In the 1920s, when the vast majority of the population lived in rural areas, a successful agricultural-based industrial policy was established and the urgent development process started with these industries. The economy has grown steadily through investment in agriculture, especially in the textile and sugar industries. Significant improvements have been made in the capital, raw material, energy, labor force, transportation and marketing issues required for industrial investments [10]. Investments through private sector activities and cooperatives have been encouraged after the Second World War, while development of the sector has been achieved with public sector identification. After the 2000s, the globalization trends that have emerged in the world economic and in the world political structure has affected Turkey, with customization activities carried out with the market economy's policies in this process is largely private sector dominance was observed. The private sector dominates today's food sector in Turkey.

A General View of the Agriculture Sector in Turkey

Reduction of the qualified population in the transition to the Republic of Turkey from the Ottoman Empire constituted one of the country's most important problems. Due to the prolonged wars, the population has significantly declined and in the years when the Republic was founded, the majority of the population was children, women, elderly and veterans. Economic activities in the country based largely on agricultural activity were significantly reduced [11]. Scarcity and poverty were at stake. As a result of many year wars, business strength has declined, production has fallen and epidemic diseases have become widespread. Turkey's ability development with their own resources was linked to the development of the agricultural sector [10]. Therefore in 1923 to develop the agricultural industry and agriculture with the establishment of the Republic of Turkey was the main target, and many development moves in this direction were carried out.

Great improvements and transformations have taken place in the agricultural sector of Turkey from 1923 until today. In the 1920s, the share of the agricultural sector in the GDP(Gross Domestic Product), was around 40% [12]. This figure has fallen below 30% in the 1970s; and now it has decreased to 7%. Again, while the share of agriculture in employment was close to 90% at the beginning of the 1930s, the share of agriculture in employment declined to below 60% from 1970's and has now declined to 20% [13]. In the period between the establishment of the Republic and the day-to-day period, the level of production, productivity and technology in the agricultural sector has also increased considerably [14]. However, this change is not yet sufficient when compared to developed countries. Considering the period between the years 2001-2015 are discussed in this study shows that Turkey's total gross domestic product showed a large increase, especially between 2001-2008 years. GDP, which was $ 196.9 billion in 2001, has risen to $ 731.1 billion in 2008. And the GDP of 2015 was 717.8 billion dollars. In this period, the share of agriculture in GDP changed between 7-10% and it was recorded as 7.5% in 2015. This rate during the first of 1980's around 20%, while in the 1990s, when taken into consideration that around 10%, Turkey can be significantly reduced in the last 30 years the share of the agricultural sector of the gross domestic product (Table 1).

Table 1. Gross Domestic Product by the Main Economic Activities (Current Prices) (by Buyer Prices) [15]

Years	Share of Agriculture (%)	Share of Industry (%)	Share of Services(%)	Share of Indirectly Measured Financial Intermediation Services (%)*	Tax Share (%)	Total Gross Domestic Product (billion dollars)
2001	**8,8**	26,8	58,5	5,3	11,1	196.9
2002	**10,3**	25,2	55,0	2,6	12,1	233.6
2003	**9,9**	24,9	54,2	1,9	12,9	303.1
2004	**9,5**	24,7	54,3	1,7	13,2	393.6
2005	**9,4**	24,7	54,1	1,4	13,3	484.2
2006	**8,3**	24,8	55,0	1,4	13,2	534.0
2007	**7,6**	24,8	57,0	1,5	12,1	648.5
2008	**7,6**	24,4	57,9	1,6	11,7	731.1
2009	**8,3**	22,9	59,6	2,3	11,5	614.5
2010	**8,4**	23,6	57,2	1,8	12,5	732.5
2011	**8,0**	24,4	56,3	1,3	12,7	777.0
2012	**7,9**	23,8	57,5	1,5	12,4	791.5
2013	**7,4**	23,6	57,6	1,6	13,0	824.8
2014	**7,1**	24,1	57,7	1,4	12,5	801.9
2015	**7,5**	23,4	57,4	1,5	13,1	717.8

* With the change in methodology, financial intermediation services are calculated in two separate sub-items, direct and indirect production. Direct production includes income from banking services. If this service is used in other sectors, it is treated as input for the total economy. This value is regarded as a negative item at the end of GDP calculations with production method as an indirect measurement of financial intermediation services.

When the crop and animal production values are examined, a considerable increase is observed between 2001 and 2017. The crop production value, which was 16.4 billion dollars in 2001, rose to 37.2 billion dollars in 2017. Again, 11.7 billion dollars of animal production was made in 2001, and in 2017 this value increased to 51.5 billion dollars. Between 2001 and 2009, crop production had a bigger share compared to animal production and after 2010, share of animal production in total production value exceeded crop production. In 2001, 58.3% of total agricultural production value belongs to crop production and 41.7% belongs to animal production. However, as of 2017, 58.1% of total agricultural production value comes from animal production and 41.9% from crop production (Table 2).

Table 2. Crop and Animal Production Values (Billion Dollars) [15]

Years	Crop Production Values (1)	Share of Crop Production (%)1/(1+2)	Animal Production Values (2)	Share of Animal Production (%)2/(1+2)	Total Agricultural Production Value (1+2)
2001	16.4	**58,3**	11.7	**41,7**	28.1
2002	21.5	**62,0**	13.2	**38,0**	34.7
2003	27.0	**59,3**	18.5	**40,7**	45.5
2004	32.1	**57,3**	23.9	**42,7**	56.0
2005	38.0	**57,6**	27.9	**42,4**	65.9
2006	38.4	**56,6**	29.4	**43,4**	67.8
2007	43.6	**54,4**	36.6	**45,6**	80.2
2008	50.6	**57,1**	37.9	**42,9**	88.5
2009	44.0	**55,4**	35.3	**44,6**	79.3
2010	53.4	**48,5**	56.6	**51,5**	110.0
2011	53.3	**46,4**	61.4	**53,6**	114.7
2012	49.1	**43,8**	63.0	**56,2**	112.1
2013	48.6	**48,5**	51.6	**51,5**	100.2
2014	45.0	**47,9**	49.0	**52,1**	94.0
2015	44.2	**48,3**	47.3	**51,7**	91.5
2016	38.9	**43,6**	50.3	**56,4**	89.2
2017	37.2	**41,9**	51.5	**58,1**	88.7

Turkey is one of the major grain producing countries and, in the examined period, "grain and other crop products" has had the largest share in the crop production value. Turkey, in cereals such as wheat and barley is among leading producing countries in the world. Turkey is also one of the world's most important fruit and vegetable producing countries. In the value of crop production, except for 2010, the second order was "fruit, drink and spice plants" group and the vegetables were in third place (Table 3).

Table 3. Crop Production Value by Subgroups (Billion Dollars) [15]

Years	Grain and other crop products	Vegetables	Fruit, drink and spice plants	Total Crop Production Value
2001	7.2	4.3	4.9	16.4
2002	9.7	5.1	6.7	21.5
2003	11.9	6.7	8.4	27.0
2004	15.1	8.0	9.0	32.1
2005	16.0	8.9	13.1	38.0
2006	14.1	10.6	13.7	38.4
2007	15.0	13.1	15.5	43.6
2008	18.4	13.9	18.3	50.6
2009	16.7	12.5	14.8	44.0
2010	18.9	17.7	16.8	53.4
2011	21.3	15.2	16.8	53.3
2012	18.5	14.2	16.4	49.1
2013	20.5	13.4	14.7	48.6
2014	19.3	11.9	13.8	45.0
2015	18.2	10.7	15.3	44.2
2016	15.3	10.5	13.1	38.9
2017	15.2	9.2	12.8	37.2

Between 2001 and 2017, there was a significant increase in both the "live animals" and "animal products" sub-groups in the animal production value and the largest share in the total animal production value was the "live animals" group. In the period examined, total animal production value increased from $ 12 billion to $ 63 billion; And 51.5 billion dollars in 2017 (Table 4). An increase in poultry meat production is an important factor in the increase of animal production value. Turkey has increased its poultry production, especially in the last twenty years, significantly, have created modern facilities utilizing the latest technology and has become one of the world's most important producers and exporters of poultry meat [16].

Table 4: Value of Animal Production by Subgroups (Billion Dollars) [15]

Years	live animals	animal products	Total Animal Production Value
2001	6.8	4.9	11.7
2002	6.9	6.3	13.2
2003	9.5	9.0	18.5
2004	12.9	11.0	23.9
2005	15.6	12.3	27.9
2006	16.1	13.3	29.4
2007	18.9	17.7	36.6
2008	19.6	18.3	37.9
2009	18.1	17.2	35.3
2010	31.2	25.4	56.6
2011	35.9	25.5	61.4
2012	35.5	27.5	63.0
2013	30.3	21.3	51.6
2014	28.6	20.4	49.0
2015	26.8	20.5	47.3
2016	29.7	20.6	50.3
2017	32.3	19.2	51.5

Overview of the Food and Drink Sector in Turkey

As Turkey is an important agricultural country, food industry as well as other agro-industries is making a significant contribution to the national economy. In parallel with the development of the agricultural sector in Turkey, the food industry also showed growth over time. Turkey is located in an important region in terms of proximity to European and Middle East markets. Alternatively it carries agricultural production facilities and suitable climate while allowing continuous supply of raw materials to the country's food processing sector in Turkey is also a major exporter of food and beverage sector [17].Turkey's geographical position that allows easy access to major markets has created an accelerating effect on the development of the sector. However, the political problems and instability experienced in recent years are affecting the export capacity of the industry negatively.

In the period between the years 2001-2015 as the food and beverage industry in parallel with the growth in total GDP it has also grown significantly in Turkey. While the contribution of sector to GDP was 40 billion $ in 2001, this value was 155 billion dollars in 2012, decreased in the following years and recorded as 136 billion dollars in 2015. The food and beverage industry's share in GDP has varied between 19-21% in the years examined (Table 5).

Table 5. Share of Food and Drink Industry in Gross Domestic Product of Turkey, (Billion Dollars) [18]

Years	Food and Drink Industry (1)	Share of Food and Drink Industry (%) (1/3)	Gross Domestic Product (3)
2001	40.0	%20.3	196.9
2002	48.5	%20.7	233.6
2003	65.3	%21.5	303.1
2004	80.0	%20.3	393.6
2005	97.5	%20.1	484.2
2006	102.5	%19.1	534.0
2007	123.4	%19.0	648.5
2008	138.3	%18.9	731.1
2009	121.1	%19.7	614.5
2010	147.5	%20.1	732.5
2011	153.0	%19.7	777.0
2012	155.6	%19.6	791.5
2013	152.4	%18.4	824.8
2014	152.2	%19.0	801.9
2015	136.2	%19.0	717.8

Food and beverage industry exports have also increased significantly in the past 15 years. The sector exports about 2 billion dollars in 2001; this figure has risen by 11.1 billion dollars in 2016, despite a decline in the last three years. Although imports of the industry have increased in the period examined, it has not been a year that the import value has passed the export value. For this reason, the sector has always given foreign trade surplus in the period under examination. Again, the number of enterprises operating in the sector increased considerably during the period examined and exceeded 40.000. In line with the increase in the number of enterprises, employment in the sector has also increased. As of 2016, the sector employs close to 500.000 people (Table 6).

Table 6. Some Indicators Related to the Food and Drink Industry [18]

Years	Exports (Billion dollars)	Imports (Billion dollars)	The number of enterprises	Employment (Persons)
2001	2.0	1.0	*	*
2002	1.8	1.3	*	*
2003	2.6	1.6	27.618	275.773
2004	4.1	2.0	32.187	285.073
2005	5.4	2.2	30.717	290.810
2006	5.2	2.6	36.728	315.196
2007	6.1	2.9	31.069	311.791
2008	7.3	4.2	34.781	328.653
2009	6.7	3.2	40.777	349.135
2010	7.6	3.7	35.631	384.484
2011	10.0	5.2	39.583	411.435
2012	10.7	5.6	40.719	455.246
2013	11.9	6.0	41.794	472.413
2014	12.6	6.2	42.560	486.347
2015	12.0	5.7	42.520	485.340
2016	11.1	5.6	*	*

* Data couldn’t be obtained.

Concentration Situation in Food and Drink Industry in Turkey

In order to understand the structure of the food industry in Turkey, clearly, it is important to establish the level of concentration in the sector. The baseline concentration ratio (CR4) was obtained by dividing the sum of the registrations of the largest 4 enterprises in an economic class by the total turnover value in that economic class. (CR8) is obtained by dividing the sum of the total of the 8 largest enterprises in an economic class by the total turnover in that economic class. Accordingly, according to the CR4 values of 2014, nine of the Food and Drink Industry sub-sectors have very high, five high, ten medium and six low concentrations. The sub-sectors in the beverage industry generally have a high and very high concentration ratio, while the sub-sectors in the food industry are more concentrated in the medium and low levels. The sub-sectors, such as beer and malt manufacturing sectors, with the smallest number of businesses, have the highest concentrations, while the concentrations of bread, fresh pastry products and cakes and milled cereal and vegetable products in the manufacturing sector are quite low.

Respectively; beer and malt production, margarine and similar edible fats, preparation of homogenized food preparations and dietetic food, distillation of alcoholic beverages, purification and blending, sugar manufacture, ice cream production, processing and storage of potatoes and ready-made food production for pets are the sub-sectors with the highest concentration in the food industry in Turkey. In all of these, CR4 is above 80% (Table 7).

Table 7. Concentration Rates of Sub-Sectors in Food and Drink Industry in Turkey (2014) [18]

Sub-Sectors	CR4	CR8	Number of enterprises	Concentration Level for 2014
Beer production	100,00	100,00	4	Very high
Malt production	100,00	100,00	1	Very high
Production of margarine and similar edible fats	95,27	100,00	6	Very high

Sub-Sectors	CR4	CR8	Number of enterprises	Concentration Level for 2014
Homogenized food preparations and dietary food production	94,43	98,62	19	very high
Distillation, treatment and blending of alcoholic beverages	94,07	99,73	10	very high
Sugar production	92,73	99,53	13	very high
Ice cream production	84,12	87,98	539	very high
Processing and storage of potatoes	83,45	97,45	21	very high
Production of ready-made food for pets	83,29	96,95	22	very high
Coffee and tea processing	69,15	78,53	274	high
Production of rusks and biscuits; manufacture of durable pastry products and durable cakes	68,18	84,79	2.801	high
Production of starch and starch products	62,65	92,98	19	high
Production of non-alcoholic beverages; production of mineral waters and other bottled water	54,86	66,02	396	high
Wine production from grapes	53,32	65,83	130	high
Production of pasta, noodle, couscous and similar bakery products	48,80	74,95	68	medium
Processing and storage of poultry meat	47,73	74,12	54	medium
Production of ready-made meals	46,69	73,33	76	medium
Production of fruit and vegetable juices	44,04	64,81	180	medium
Meat processing and storage	43,77	55,72	288	medium
Processing and storage of fish, shellfish and molluscs	41,20	62,66	122	medium
Production of other food products nec	37,87	61,28	224	medium
Production of cocoa, chocolate and confectionery	36,82	55,14	1.212	medium
Production of products produced from meat and poultry meat	35,55	50,71	269	medium
Dairy management and cheese production	32,57	42,50	1.674	medium
Production of spices, sauces, vinegar and other condiments	24,41	37,48	299	low
Liquid and solid oil production	21,11	34,92	1.270	low
Ready-made feed for livestock	18,91	29,01	404	low
Processing and storage of fruit and vegetables nec elsewhere	13,58	21,27	1.537	low
Production of ground cereals and vegetable products	8,33	14,45	3.124	low
Bread, fresh pastry products and fresh cakes	7,27	10,71	28.256	low

SWOT Analysis for Agri-Food Sector

As can be seen from the macro data, agri-food sector has a great potential and very important for the Turkish economy. However, like other sectors, there are some of the challenges and problems faced by the sector in Turkey conditions. The structural problems of the agricultural sector directly affect the agri-food industry, especially the food industry. Indeed, most of the agri-food industry in Turkey consists of small and medium-sized enterprises and in this case, is also adversely affect modernization of the technological structure and the quality and capacity of production [19]. In this study, SWOT analysis was conducted to reveal the sustainability of the sector and the findings were summarized as in Table 8.

Table 8. SWOT Analysis for Agri-Food Sector of Turkey [20, 21, 22]

Strenghts	■ Having a traditional agricultural production culture ■ The fact that food demand has increased due to the rate of population growth and the fact that this is met by domestic sources ■ The existence and diversity of agricultural raw materials ■ Turkey's geographical position and historical identity as a strategic point of presence ■ Technically compliant with the EU of food legislation
Weaknesses	■ Branding is not enough ■ Lack of inspection and control ■ Prevalence of unregistered ■ Inadequate share of AR-GE and inadequacy of infrastructure and work on AR-GE ■ The intensity of SMEs and family businesses in the sector ■ Capital inadequacy of the enterprises and problems with the financial markets ■ Inadequacies in hygiene ■ The issue of fraud and adulteration in food products ■ Price instability in agricultural products ■ Inefficiencies in producers' access to the market and in organization ■ High external dependency, especially in the use of agricultural inputs
Opportunities	■ High export potential in terms of location ■ Positive effects of tourism sector on food demand ■ The fact that Turkey has a lot of traditional products; and potential of food products with geographical indication ■ New emerging market areas for food products with new marketing techniques (such as e-commerce) and customer-focused market strategies ■ R&D, governmental support and encouragement for promotion and branding in foreign markets
Threats	■ High energy costs and enormous external dependence on energy ■ Political and economic instability in Middle Eastern countries where exports are intense ■ Technical labor force needs of the sector ■ Unstable agricultural policies ■ Negative effects of climate change on production and markets ■ Abandonment or non-agricultural use of agricultural land ■Due to migration from rural areas to urban, especially in some regions the risk of sustainability of agricultural production ■ Increase in input cost with exchange rate fluctuations

General Evaluation and Conclusion

In the period up to the present day from the date of establishment of the Republic of Turkey in the agricultural and food sector has been significant development and transformation. Turkey is among the most important countries in the world in agricultural production, both production and export of agricultural and food sector has increased significantly in recent years. In particular, proximity to the European and Middle East markets had a significant advantage for Turkey and the export to these regions has created a supportive effect for the sector. However, the political and economic instabilities in the Middle East and crises in various countries narrowed the exports of the sector from time to time and led the sector to seek different markets and develop different solutions. Despite all these developments in the agri-food sector, there are some shortcomings and threats to the sector. Lack of control, prevalence of unregistered, price instability in agricultural products, the existence of fraud and adulterated products, inadequate capital of SMEs and family businesses in the sector, inadequacies of producers' access to market and organizing are among the most important problems of the sector. Besides; imports for inputs such as feed, fertilizer, agricultural medicine and energy are an important threat to the sustainability of the sector. Even in some powerful sub-sectors, such as the poultry sector, for example, a large proportion of feedstuffs are imported. Fluctuations in foreign exchange rates make it difficult for the sector to plan, increasing cost and price instability. Import dependency for inputs used in production is one of the most important issues to be studied carefully for solution and sustainability of the sector [16, 23].

Despite the problems and shortcomings experienced in the sector, Turkey has a great potential in the agri-food industry due to factors such as the presence of agricultural land suitable for agricultural production, agricultural product diversity and high rural population.

In order to solve the existing problems:

1. Quality products should be produced and marketed by increasing R&D expenditures.
2. Stable agriculture and food policies should be established
3. The integration between agriculture sector and the food industry must be successfully established.

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