

**SECTORAL ANALYSIS:  
DAIRY, TOMATO, CEREAL, POULTRY**

Editors

**İlkay DELLAL**

*Agricultural Economics Research Institute, Turkey, (AERI)*

**Siemen van BERKUM**

*Agricultural Economics Research Institute, The Netherlands, (LEI)*

**ANKARA  
March 2009**

This study was carried out within the context of EU Impact Analysis studies of Agricultural Economics Research Institute (AERI) and in cooperation with Agricultural Economics Research Institute of the Netherlands (LEI).

**PUBLICATION NUMBER: 171**

**ISBN 978-975-407-268-6**

Copyright 2009 by Agricultural Economics Research Institute.

Authors are responsible for opinions expressed in the report.

All rights reserved.

No part of this report may be reproduced or stored in any form or by any means mechanical, electronic, photocopy, magnetic, tape or otherwise, without permission in writing from Agricultural Economics Research Institute.

**CONTENTS**

Agricultural Sector Analysis in Turkey and Integration to the EU : Dairy, Tomato, Cereals, Poultry, <i>Í. Dellal, S. van Berkum</i> .....	1
Turkish Dairy Sector Analysis, <i>K. Taşdan, S. İriboy, A. Çeliker, U.Gül, Y. İçöz, S. van Berkum</i> ....	9
Turkish Tomato Sector Analysis, <i>G. Keskin, T. Özudođru, C. Nazlı, S.van Berkum</i> .....	58
Turkish Cereal Sector Analysis, <i>H. Ege, D.Dönmez, N.Yılmaz, John Belt</i> .....	89
Turkish Poultry Meat Sector Analysis, <i>H.Çınar, A.Demir, Ş.Kalanlar,B.Taşkaya, S. van Berkum</i> .....	124



## **Agricultural Sector Analysis in Turkey and Integration to the EU : Dairy, Tomato, Cereals, Poultry**

İlkay DELLAL  
*AERI*

Siemen van BERKUM  
*LEI*

### **1. INTRODUCTION**

Turkey has a long history in its way of becoming a member of the European Union (EU). This history started in 1959 with Turkey's application to the then one year old European Economic Community. In 1963 Turkey and the EEC signed the Ankara Agreement, an association agreement covering the liberalisation of markets for goods and financial aid. Turkey applied for membership of the European Community in 1987 and in 1996 the Turkey-EU Customs Union took effect. Agricultural products were not included in the Customs Union, although a significant part of agricultural trade takes place under preferential agreements. Turkey achieved candidate status at the 1999 Helsinki Summit but only in 2004, the EU declared that Turkey had made enough progress to begin talks that should result into membership of the Union. This process of accession negotiations – which is basically a negotiation on the duration and content of a transition period Turkey would need before the country would fully comply with all criteria and conditions of an EU membership - still continues in 2009. In this long history many changes have happened in agriculture, agricultural markets and policies at both sides.

In the 1950s agricultural policy in Western Europe centered around subsidizing farmers to provide enough food for Europe after war-induced shortages. Once EU self-sufficiency was reached from the 1980s onwards, the policy led to almost permanent surpluses of basic farm commodities ('butter mountains', 'wine lakes', etc.). The CAP was subsequently increasingly used for export and storage subsidies. A series of reforms have taken place over the past two decades to remedy the surplus problem and take account of the environmental sustainability of agriculture (1).

The first major reform of the CAP was implemented in 1992, to limit rising production, while at the same time adjust to the trend towards freer agricultural markets. The reform also created 'set-aside' payments to withdraw land from production, limit stock levels and introduce measures to encourage retirement and forestation (1).

The second major CAP reform was adopted as part of the Agenda 2000 package in March 1999, which divided the CAP into two 'pillars': production support and rural development, the latter including issues such as trade, tourism, environmental protection and biodiversity (1).

The biggest reform so far was launched in 2003 and featured a 'decoupling' of agricultural production from subsidy payments to prevent over-production and waste. The new system involves a Single Payment Scheme (SPS), in which subsidies are allocated according to indicators such as land size rather than production volume (1).

Cross-compliance measures, whereby farmers are required to meet certain environmental, food safety and animal welfare standards, were also introduced as a pre-condition for receiving payments under the SPS. The reform also featured a shift or so-called 'modulation' of monies from the first pillar of the CAP (direct aid and market support) to its second pillar, rural development (1).

The 2003 reform was agreed upon just before the eastward enlargement of the bloc in 2004. The extension of the CAP to the new Eastern and Central European countries would have increased its budgetary burden to an unsustainable level. Indeed, the EU's enlargement doubled the agricultural labour force and the arable area of the EU, and added over 100 million food consumers to the internal market. Poland and Romania combined have almost as many farmers as the entire EU before enlargement (1).

The latest policy review, dubbed the CAP Health Check and launched in 2008, aimed to further modernise the policy and assess whether adjustments are needed to ensure that it is still relevant for new challenges, such as climate change. The EU 27 also agreed to further cut direct subsidies to farmers, for the benefit of rural development policy, and to abolish milk production quotas (2).

At the beginning the number of countries in union was only six. The union has grown in size through the accession of new countries and recently reached 27 members. Agriculture has been its core aim operated by a system of subsidies and market intervention by CAP during

this period. The CAP currently represents some 45% of the EU's long term budget for 2007-2013, compared to nearly 70% in the 1970s (3).

Although there is a common policy for agriculture across the EU-27, this does not mean that the agricultural sectors in the individual Member States are all similar. Due to varying physical, climatic and socio-economic conditions in the EU Member States, agriculture has evolved from a wide range of different circumstances. In some Member States the emphasis is on dairy or livestock production whilst others focus more on arable crop production or horticulture. In some countries the average farm size is over 40 ha, whereas in others it is less than 10 ha. In addition, in some countries the share of total employment within the agricultural sector is now very small, whereas in other places – especially in the new Member States – the share is still over 10%. Also, in some areas agriculture is under pressure due to high population density and urban expansion whilst in other parts of Europe it operates in the context of continued population decline and progressive land abandonment (2).

Turkey, a country with characteristics such as its huge size in terms of EU's average, has also transformed its agriculture during this period. Agriculture was the main sector in 1950's. Of the total GDP, employment and export, 34% of GDP, 75% of employment, 77% of export was originated from agriculture (4). Although the shares have gone down gradually over time, agriculture is still an important sector in the Turkish economy (in 2008 8% of GDP, 26% of employment, 8% of export) (5) and therefore needs special attention in the pre-accession process. The competitiveness of the Turkish agriculture and the food industries as well as the economic sustainability of the rural areas will be major political and economic challenges in the future.

The aim of this study is to analyze of the present situation in the agrifood sector in Turkey. This is essential for identifying development needs of the Turkish agri-food and rural sectors. Such sector analyses therefore may guide government staff as well as those in the agricultural business sector itself to formulate proper policies addressing these needs. The options open for government to intervene in improving the sector's competitiveness should be compatible with EU rules and regulations, as laid down in the *acquis communautaire*.

## **2. MATERIAL AND METHOD**

Reaching the aim of the study four sub-sectors - dairy, tomato, cereals, and poultry - were selected in terms of importance and need of study.

Firstly, to conduct a sub-sector study relevant data were gathered for each sector from national institutions for a statistical analysis, supplemented with literature review. Secondly, representatives of selected institutions and experts were interviewed and some field visits were conducted to identify the sector's problems and get a thorough insight into the structure and performance of the sub-sector. Based on the analysis and interviews a SWOT analysis was drafted for each group. Thirdly, a full report was drafted and distributed to each sectors' related stakeholders. Then, a stakeholders meeting was held to listen to their opinions and to take their comments on the draft report. In those meetings stakeholders' opinions about the problems of sector were gathered and discussed. Finally, the draft report was revised, taking the stakeholders' comments into consideration. Thus, the reports which includes a comprehensive analysis of studied Sub-Sectors, aim to introduce the situation and performance of the sector, therefore to identify the constraints weakening the competitiveness and to suggest policy recommendations which help to enhance the competitiveness of the sector.

## **3. RESULTS**

Full reports of four sub-sector studies can be found in the following chapters. Below the major findings of these reports are summarized.

### **Dairy**

Subsistence and semi-subsistence is a main characteristic of dairy farming in Turkey. There are over 2 million agricultural holdings producing cow milk, the overwhelming part with less than 5 cows. Larger scale of dairy farmer is in the western part of the country, where Turkey's milk production is concentrated. There are more than 2000 dairy processing units, most of them operating at (very) small scale and seasonal basis.

Only an estimated 50% (out of about 11 million tones) of cow milk production is being processed by the industry, while 20% of it is utilised on-farm, and the other 30% by direct



sales (mainly on street markets). The latter is largely unregistered and unregulated, contributing to the informal economy and jeopardising public health as raw milk is being sold under doubtful hygienic circumstances and without cooling.

Except for the 10% larger and/or more modern equipped farms, the Turkish dairy sector suffers from low quality of milk and low yields per cow. Seasonality of production is high as most farmers lack the means to buy compound feed to supplement own cultivated winter silage.

Like the dairy farm sector the milk processing is divided into a modern processing industry and traditional processing (informal sector). The modern processing companies have an extensive network for milk collection from farms directly and through dairy cooperatives while some of them operate their own collection centers at village level. There is a strong competition among the modern dairies as processing capacity with most dairies is much higher than the milk they handle. Much attention is being paid to milk sourcing. Supply contracts are generally only valid for a 3 months period. Modern dairy processors provide coops and farmers additional benefits through offering training programs at own training farms and through advice staff coming around at farms. Improvement of milk quality is an important issue in the training.

The majority of the dairy farmers is however not connected to the industry and use their milk on-farm or sell milk and milk products on street markets, or only very loosely to so-called mandiras, which are seasonally, generally small-scale operating processors.

Due to an increasing (young) population and growing income levels the sector has good prospects of increasing sales in the years to come. At the same time, there is an urgent need for modernization of the dairy industry to deliver efficiently the high quality and differentiated products consumers increasingly want.

## **Tomato**

Turkey is among the countries producing various kind of vegetable at high production level due to suitable ecological conditions. However it can not use that production advantage for export sufficiently. The figures on production, utilization in industry and domestic consumption and export are taken into consideration the most important product is tomato for Turkey. As tomato comprises the half of protected vegetable production it is the primary

product of protected agriculture. Some of the most important problems in the sector are: the complexity of marketing channels, insufficient effectiveness of producer in marketing channels, land segmentation, big production losses, the lack of enough storage and protection facilities, the low capacity usage for processing industry, the shortness of processing period because of difficulties in fresh material supply. In addition more progress are also needed in the areas of good agriculture practices (GAP) whose importance increasing recently for competitiveness, traceability and food safety.

All stages from production to industry and consumption at farmer level have been tried to explain generally by this study and finally strengths and weaknesses have been tried to determine by making swot analysis comparing the current state with EU countries.

### **Cereal**

The cereal sector is the largest agricultural sector in Turkey: almost 70% of all farms produce a type of grain. Wheat is the most important crop with 67% of total grain production, followed by barley accounting for 26% of total cereal production in 2007.

The main problem of wheat production is that it predominantly takes place in dry and marginal areas. As a result the yields are only 2.3 ton/ha, relatively low compared to average EU-levels. Yet, yields have increased in recent years, which is said to be due to an increased the use of certificated wheat seeds. Wheat is mainly (95% out of 20 million ton) used for human consumption, while barley is used for fodder (90% of 9 million ton). Barley yields have fluctuated between 2.1 and 2.6 ton/ha in recent years. Yields of maize, the third important cereal in Turkey (3-4 million ton) have increased strongly over the last ten years, also due to the use of improved seeds.

At farm level the sector is characterised by numerous fragmented holdings with very small plots or medium sized land areas. The dysfunctional land registration system makes it difficult for farmers to obtain credit, as land cannot be used as collateral. Important input items such as fertilizers are expensive because of imported raw material (phosphate, nitrogen).

About half of the production of cereals is marketed and sold to processing plants, at wholesale markets, to private traders and to the Turkish Grain Board. The rest is being used on-farm to meet own consumption needs and as seed for the next growing season.

Due to its strategic importance the cereal sector is being protected by relatively high tariff rates. As a result the Turkish prices are well above international (world) market prices (and higher than EU levels). TMO (Turkish Grain Board) may affect the market prices significantly by its cereals purchases that follow from considerations of market balance (and stable prices) and for strategic stock building. Further, cereal producers are supported by direct income payments and input subsidies. Yet, the profitability of wheat production is relatively low, mainly due to the high costs of production and the low yields.

All grain processors in Turkey are private companies; most of them own small or medium sized factories. One of the characteristics of the industry is that their capacity utilization is generally low: 2005 figures indicate that only 36% of the processing capacity had been utilized in the wheat flour industry, 50% in the pasta industry, 58% in the biscuit industry and 44% in the starch-based sweetener industry. High prices for the raw material (cereals) and irrational investment decisions are the main reasons for these low percentages. Many companies operating in the grain processing industry, especially in the flour industry, are not profitable. On the other hand, Turkey's pasta and wheat flour exports have been increasing continuously in recent years.

### **Poultry**

The poultry meat sector consists of production on farm level and the processing industry of broiler, turkey, duck and goose ready for consumption. In Turkey, 93% of poultry meat production is from integrations (vertically integrated poultry meat producers, including input suppliers, farms and processing units) today. The organisational form of integrations came up in the poultry sector during the 1970s. Especially after investments in infrastructure in the 1980s (connecting regions and thus markets), the sector could respond to increasing demand for animal products because of population and income growth. Furthermore, poultry meat is considered healthier than beef meat and red meat prices are higher than for poultry meat, two additional reasons why demand for poultry meat increased significantly in the last decades. Yet, per capita consumption in Turkey is still much below the average consumption levels in many European Union member states and other developed countries.

Avian Influenza (AI), an animal disease carried by wild birds, was seen in Turkey like many countries. Until the first AI plague in Turkey, that appeared especially in backyard poultry

during the last months of year 2005, it was a common and legal practice to slaughter the spent hens from layer flocks, and subsequently to sell backyard poultry in open markets. This practice was forbidden and left, and it was decided to slaughter spent hens in separate slaughterhouses and to ban backyard poultry to be sold in open markets in an attempt to further reduce the possibility of AI spreading.

Poultry meat production is largely marketed at the domestic market; export is not a major part of the sector's production. Most important export markets are the Caucasian and Balkan countries, China and Hong Kong. Germany and France are small export markets for frozen birds. Due to AI outbreaks EU authorities carefully inspect Turkish slaughter houses and laboratories frequently.

Taking into account the main technical performance parameters (mortality rate, feed conversion rates and live weight at slaughter), Turkish poultry meat producers show better results than those in neighbouring countries such as Romania, Bulgaria and Iran. In its comparison with the chicken meat sector in the Netherlands it occurs that Turkish feed costs per kg live weight are significant higher, caused by the relative high prices paid in Turkey for compound feed. The sector is depended on imports of protein feed, breeding stocks and vaccines. Relative strengths of the sector are their modern state of art (partly), the integrated structure with large scale integrators and good technical efficiency indicators.

## REFERENCES

1. David; Robert Whaples (eds) (22 June 2007). "[Common Agricultural Policy](#)". EH.Net Encyclopedia. <http://eh.net/encyclopedia/article/Stead.CAP>. Retrieved on 30 August 2007.
2. EU Commission 2007 Communication from the Commission to the European Parliament and the Council Preparing for the "Health Check" of the CAP reform, Brussels, 20.11.2007 COM(2007) 722 final.
3. Eurostat 2008. [www.ec.europa.eu/eurostat](http://www.ec.europa.eu/eurostat)
4. TURKSTAT 2005. [www.tuik.gov.tr](http://www.tuik.gov.tr)
5. TURKSTAT 2008. [www.tuik.gov.tr](http://www.tuik.gov.tr)

## Turkish Dairy Sector Analysis

Kemalettin TAŞDAN      Sevgi İRİBOY      S.Ahmet ÇELİKER  
Umut GÜL      Yıldırım İÇÖZ      Siemen van BERKUM

### 1. INTRODUCTION

#### *Background and approach of the study*

The aim of this report is to describe and to estimate the state and performance of the dairy sector in Turkey. The report aims to judge the competitiveness of the Turkish dairy sector, to identify key constraints to competitiveness and to develop policy interventions to improve the competitive position of the sector.

The common methodology established is based upon internationally accepted definitions of competitiveness, which focus on the ability of individual industries to “profitably maintain or increase market share” in either domestic or international export markets. Structure, conduct, and performance concepts are combined with resource analyses in judging the competitiveness of the Turkish dairy chain, to identify key constraints to competitiveness and to develop policy interventions to improve competitiveness. The study considers the entire dairy chain from small-scale milk production at the farm level through to processing and retailing activities.

This sector report covers the following issues:

- a description of the sub-sector based upon secondary data covering among others trends in production, consumption and trade, yields, prices, concentration of production, capacity utilization, and a description of the linkages within the food chain;
- primary data collection using case-studies to illustrate key activities in the dairy sector and identify lessons for the sector’s development;
- an identification of key-constraints limiting the competitiveness and development of the sector;
- and an identification of policy options.

The structure of the report is as follows. After this brief introduction, an overview of the present situation and conditions in milk production and processing in Turkey is provided in Chapter 2. Chapter 3 further elaborates on the issue by evaluating factors, which influence the competitiveness and efficiency of the milk chain. Based on these analyses, the sector's Strengths and Weaknesses, Opportunities and Threats are identified in Chapter 4. Such a SWOT analysis gives the possibility to define prerequisites and directions for the sector's future development. The recognition of key constraints leads to a series of ideas for policies that may address the obstacles to further development and help reduce the inefficiencies identified. Chapter 5 drafts policy options in as much detail as is possible at this stage.

## **2. OVERVIEW OF TURKISH DAIRY SECTOR**

### **2.1. Sector definition**

Subsistence and semi-subsistence is a main characteristic of agriculture in Turkey and so it is in dairy farming. There are over 2 millions agricultural holdings producing milk, mainly concentrated in western parts. East and Southeast Regions perform livestock production for local consumption or with breeding aim. Besides, the dry and (in summer) hot climate in the south-east causes the region's share in milk production to be low.

There are more than 2000 enterprisers in the milk processing industry. Yet, according to SETBIR, which most of the firms in the industry are members of, 6 big scaled enterprises produce 41% of the milk in the milk processing industry (FAO, 2007).

Beyond the processing sector, the most effective distribution of processed milk and dairy products involves private specialized markets, private wholesalers and the distribution networks of retail chains. The latter is a rapidly increasing market channel for food in Turkey.

### **2.2. Production and Value Added**

There is an increasing trend in milk production according to 2000-2006 data. (Table 1). Milk production value increased from 2,239 million YTL to 8,634 million YTL. The biggest increase was in 2002 with a rate of 63%.

40-45 % of total livestock production value is generated by milk production which indicates that milk has a significant place in livestock production. The share of milk production value in total agricultural production value is 8-9 %.

Table 1. Share of milk production in Agricultural and Animal Production Value (GAO), 1995-2004

<b>Production value (million YTL)</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Agricultural production	26,724	34,389	52,135	68,393	79,649	88,365	96,357
Animal products	5,152	6,069	9,400	13,443	15,574	16,506	18,898
Milk production value	2,239	2,883	3,524	5,753	6,595	7,169	8,634
Increase rate of milk production value (%)	-	28.8	22.2	63.3	14.6	8.7	20.4
Share of milk in aggregate livestock prod. output (%)	43.5	47.5	37.5	42.8	42.3	43.4	45.7

\* Except live animals

Source: Turkstat, Different Years

Table 2 indicates that the industry generated 7,923 million YTL of Gross Value Added (GVA) in 2005, 15% of it came from milk and the milk products industry. It was 13.6% in 2000. Although it is not high, it shows that the milk sector has become more important within the food industry.

Table 2. Share of value added of the milk industry in total value added in the food industry, 1999-2005

	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Total value added in food industry (million YTL)	6,682	6,400	6,692	7,032	7,500	7,923
Value added of milk sector industry (million YTL)	907	915	964	1,040	1,108	1,187
Increase rate of value added of milk industry (%)		0.9	5.4	7.9	6.5	7.2
Share of value added of the milk sub-sector industry in total value added (%)	13.6	14.3	14.4	14.8	14.8	15.0

Source: SPO, 2007

### **2.3. Marketing Channels**

All the milk supplied to the market comes from domestic production. Most of the imported milk products are processed products, notably milk powder.

Milk production in Turkey was 12.0 million tons in 2006 of which 10.9 million tons (90.8%) was obtained from cows. According to results of the last Agricultural Census, there were

2.147 million holdings performing livestock production in 2001. There were approximately 4.2 million cows in livestock farms (TURKSTAT, 2007, TURKSTAT. 2008a,b) and in the same year the production was nearly 132.6 million tons in EU-27 (EUROSTAT, 2008). Turkey is much like France and Germany in terms of number of animals but the milk production of Turkey is very low when compared with these countries. The main reason of this situation is the high levels of yield per head in EU countries.

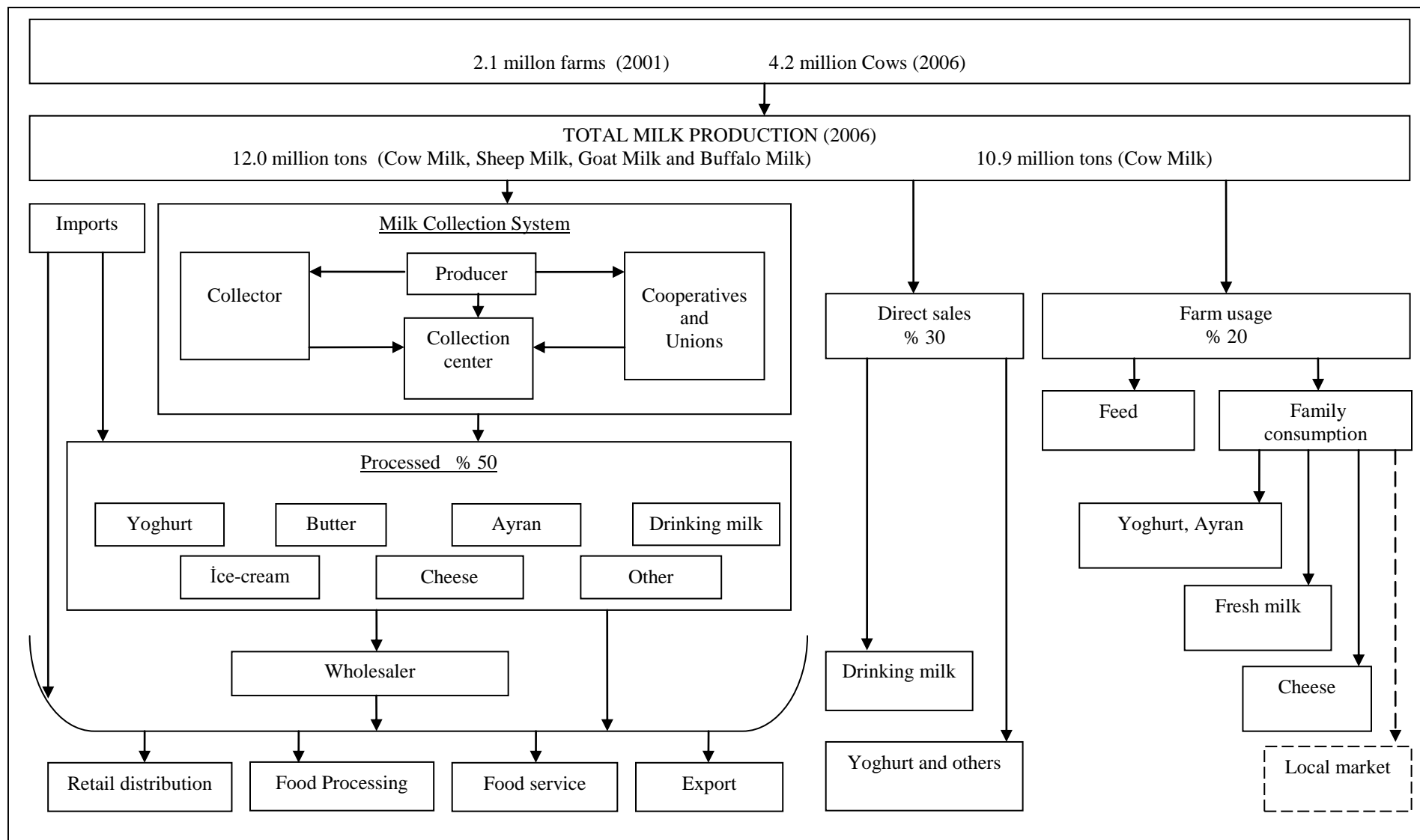
Milk and milk products get to the market through three channels. These are:

1. Processing industry ( 50% of total production)
2. Direct sales, street milk etc.
3. Usage within the holding

However, there is a serious problem of displaying the flows within the chain due to the incompleteness of statistical data. Some values in the flow charts are based on former studies and interviews with stakeholders.

There are different kinds of mediators in the milk collecting system, such as producers, municipalities, village cooperatives/unions and wholesalers. In the collecting system, milk is carried to the small collecting units called village centres by the producers, and then it is transported to the big collecting centres or processing units by mediators such as collectors, buyer firms or unions.





Source: Turkstat, 2006, FAO, 2006, Interviews with Stakeholders (SETBİR, DSYMB)

Figure 1 Overview of Turkey milk sector and milk flows

A big portion of the milk supplied for processing, almost half, is utilized in cheese production while the rest is utilized in yoghurt, ice cream, butter and ayran, milk powder respectively. Some of it is sold as liquid milk. Processed milk products reaches the final consumer through processing units or allocation channels owned by wholesalers as well as the other small manufactory holdings such as pastry shops after turning the raw material into an intermediate good. A minor part of it is exported.

A considerable amount of milk is processed by small-scale, labour intensive processing units called “mandira”. They usually do not possess a milk collection and distribution system and they mainly concentrate on production. Moreover a significant number of mandiras are run seasonally and unregistered. Yet, the position of mandiras is strong in the market due to low prices and the familiar taste of their products. They have important advantages considering their potential to grow into big enterprises. Sütaş and Yörsan are good cases as they made the right investments and have a considerable share in the market today (CEEC, 2006; FAO, 2007).

These so-called mandiras would process between 18% and 35% of the milk produced according to several sources. Also the estimate of the milk production, which is not processed, is subject to a high degree of variation. Farm family consumption is estimated in the range between 15% and 40%, including milk fed to farm animals.

Direct sales, which means that a producer or collector sells directly to the final consumer, have a share of 30% of the milk production. Direct sales are performed in two ways: as fresh milk (drinking milk) and as yoghurt and other milk products. Street milk which is listed under direct sales is a marketing issue highly focused on.

The street milk seller may produce his/her own milk and sell or buy the milk from milk collectors or directly from a producer. This situation indicates a very serious problem regarding the food safety as raw milk is sold mostly under doubtful hygienic circumstances, without packaging and cooling. Moreover the origin of street milk (i.e. from which animals, or farmers) is usually unknown, as it relates to milk from unregistered cows and/or dairy farms. Therefore, unregulated sales on street markets with respect to legal framework and control mechanisms could easily jeopardise public health. Even though this risky position is known by consumers, many prefer to consume street milk in order to make yoghurt, desserts,

etc. by traditional methods. Moreover, the miss-belief that street milk is of better quality and fresher than pasteurized milk is another reason for people to prefer street milk (FAO, 2006). Considering these consumer choices, a marketing network (like performed in certain countries) which enables street milk to be collected and packaged in 1-3-5 liter plastic or paper containers and then sold may increase the number of registered holdings and provide healthier products for the consumers.

Usage within the holdings - nearly 20% of total milk production - is for calf feed and home consumption in particular. The significant level of farm usage and direct sales is a consequence of several factors including the small-scale structure of production which is unable to operate with commercial aims, subsistent or semi-subsistent livestock farming, lack of commercial solidarity among many producers and an underdeveloped milk collection system.

#### **Box 1. Union of Dairy, Beef, Food Industrialists and Producers of Turkey (SETBİR)**

SETBİR, which is centred in Ankara, was established in 1976 by leading industrialists and producers engaged in the Turkish livestock sector. Its primary goal is to raise public awareness on common problems facing the industry and initiate joint efforts to deal with such problems. It has many activities aiming to upgrade the technological level of the processing plants by modernizing them in parallel with European Union standards.

SETBİR worked in cooperation with FAO in writing the sectorial report on dairy for Turkey for making up the IPARD plan. According to these works, there is a considerable difference between the official data and the real indicators when the working groups visited the field. They visited many provinces of Turkey including Bursa, Thrace, İzmir etc. They made an extensive investigation on the sector in Konya.

SETBİR estimates that 20% of the milk produced is utilized on the farm, 20% street milk, 33% in mandıras or in middle medium holdings, and 27% of it in big companies. It was also told that Turkey may have a comparative advantage in the production of goat and sheep milk.

SETBİR has an optimistic view of the future. According to SETBİR there are two main problems. One is the milk produced below the international quality standards and the other is the high production and transport costs. It was specified that the enforcement of the law on hygienic standards and food safety in small dairies was very unsatisfactory. SETBİR thinks that if programs are initiated to improve the raw milk quality and decrease the cost, than Turkey will be able to meet the demand by its own milk produced in the country instead of importing. It was also added that the dairy sector became very popular among the entrepreneurs and now many industrialists would like to invest in the livestock sector. The increase in investments in the sector shows this.

## **2.4. Chain analysis**

### **2.4.1. Farm structures**

#### *Number of Animals*

The number of animals (cattle) and cows considerably declined in Turkey between 1991 and 2006. Animal numbers declined by 9%, from 12 million to 10.9 million while the number of cows dramatically decreased by 32% from 6.1 million to 4.2 million between 1991 and 2006 (TURKSTAT, 2008b). The unused meadows in East and Eastern Anatolian Regions due to security reasons and the producers that quit livestock production during the economic crisis that broke out in the early 2000's may cause this depletion (TÜSİAD, 2008). Furthermore, the rise in feed prices caused by the increase in food prices due to drought and the increase in bio fuel production affected livestock production negatively.

According to the 2001 Agriculture Survey, the number of holdings performing only animal farming including stock farming was 73 thousand head. There were 2.9 million animals; of which 384 thousand were bovines in particular. Animal and plant production are practised in about 2 million holdings. The numbers of bovines found in these holdings was about 11 million (TURKSTAT, 2004). However, not all of these holdings produce milk commercially. The important thing regarding dairy industry is to define the dairy farm and therefore determine the number of these holdings.

Number of animals by region shows that 15.3% of the animals are found in Northeast Anatolia in 2006. Aegean (14.3%) and West Blacksea Region (13.7%) follow it. The number of dairy cattle (cows) which makes 38.5% of all animals sets a similar situation. 13.9% of dairy cattle are found in Aegean while 13.3% of them are in Northeast Anatolia and 13% in West Blacksea (Table 4). There is a concentration among three regions with respect to the numbers of animals and dairy cattle.

In terms of herd composition, 43% of animals and dairy cattle are composed of cross breeds whereas 26% is pure bred which has a high productivity.

#### *Holdings by size*

It is obvious that the holding structure is inadequate for intensive production since most of the holdings (85%) own herds with less than 9 animals. The share of animals owned by these holdings is 57% in total number of animals (Table 3). The share of holdings possessing herds

with more than 50 animals is 3.6%. Average animal number, or herd size per holding is 5.7 heads.

97.7% of animals in holdings producing milk had between 1 and 25 head in 2005 while 0.02% of them had more than 100. Average herd size per holding was 4.4 (TÜSIAD, 2008).

Table 3. Number of Holdings and Animals by size

Holding Size (head)	Number of holdings		Number of animals		
	Number	%	Number	%	Average
1-4	1,043,022	59.7	2,763,708	27.7	2.6
5-9	447,078	25.6	2,884,064	28.9	6.5
10-19	196,193	11.2	2,509,716	25.2	12.8
20-49	55,598	3.2	1,463,583	14.7	26.3
50-149	4,936	0.3	319,650	3.2	64.8
150-299	76	0.0	16,349	0.2	215.1
300+	24	0.0	17,615	0.2	734.0
<b>Total</b>	<b>1,746,927</b>	<b>100.0</b>	<b>9,974,685</b>	<b>100.0</b>	<b>5.7</b>

Source: TURKSTAT, 2004.

\*All animals including cattle and buffalo in every age, except for fattening

As the holdings are very small and scattered the cost of collection and transport of milk is relatively high. This raises the cost of processing and makes it difficult for the processors to find raw milk for processing, which becomes an obstacle for obtaining raw milk consistently. One of most effective ways of diminishing these problems is the cooperatives and producers organisations. They can provide marketing services such as common milking units and transportation. Moreover, creating an livestock region is important with respect to solving structural problems.

Insufficient areas of grassland and pastures and transportation problems are natural causes that constrain the development of the sector. And financial problems stem from lack of capital and technology with high investment cost.

Table 4. Animal Numbers in Total (Bovine) and Milking Cows by Regions and by Breed (2006)

	Animal Numbers								Milking Cows							
	Pure breed		Cross Breed		Dom. Breed		Total		Pure breed		Cross Breed		Dom. Breed		Total	
	000	%	000	%	000	%	000	%	000	%	000	%	000	%	000	%
TR1 İstanbul	10	0.4	43	0.9	3	0.1	57	0.5	5	0.4	22	1.2	1	0.1	28	0.7
TR2 West Marmora	535	19.3	276	5.9	46	1.4	857	7.9	226	20.4	120	6.7	20	1.5	365	8.7
TR3 Aegean	665	24.0	672	14.3	221	6.5	1,558	14.3	261	23.6	242	13.4	78	6.1	581	13.9
TR4 East Marmora	236	8.5	316	6.7	101	3.0	654	6.0	95	8.5	113	6.3	36	2.8	244	5.8
TR5 West Anatolian	191	6.9	252	5.4	140	4.1	582	5.4	75	6.8	91	5.0	48	3.7	214	5.1
TR6 Mediteranean	268	9.7	486	10.4	94	2.8	848	7.8	115	10.4	208	11.5	36	2.8	358	8.6
TR7 Middle Anatolian	249	9.0	535	11.4	243	7.1	1,028	9.5	98	8.9	216	12.0	84	6.6	398	9.5
TR8 West Blacksea	234	8.5	675	14.4	578	17.0	1,487	13.7	79	7.2	245	13.6	221	17.2	545	13.0
TR9 East Blacksea	67	2.4	294	6.3	213	6.2	573	5.3	26	2.4	137	7.6	99	7.7	262	6.3
TRA Northeast Anatolian	92	3.3	696	14.8	872	25.6	1,660	15.3	31	2.8	234	13.0	292	22.7	557	13.3
TRB Middle east Anatolian	162	5.8	273	5.8	468	13.8	903	8.3	73	6.6	114	6.3	188	14.7	375	9.0
TRC Southeast Anatolian	63	2.3	177	3.8	425	12.5	665	6.1	22	2.0	58	3.2	179	14.0	260	6.2
Total	2,772	25.5	4,694	43.2	3,405	31.3	10,871	100.0	1,107	26.4	1,799	43.0	1,282	30.6	4,188	100.0
Milking Cows / Total									39.9		38.3		37.6		38.5	

Source: TURKSTAT, 2008b

Small and scattered holdings generally achieve low labour and land productivity and produce against high costs. Moreover, dairy farming is not performed as an economic profession, but as subsistence farming, which is important from a social and food security point of view. When these producers quit production they intend to move to big cities which cause may imply serious social problems when the manufacturing and service sector can not employ people coming from rural areas. In respect to aforementioned issues, small producers should not quit production but they should be encouraged to seek ways for more productive and profitable production via producer organisations.

### **Box 2. Livestock Cooperative Unions: Köy-Koop and Hay-Koop**

There are two important cooperative unions in Turkey: Village Development and Other Agricultural Cooperative Unions (Köy-Koop) founded in 1971 and Turkish Livestock Cooperative Central Union (Hay- Koop) founded in 2003. The two collect about 2-3 million tons milk and provide raw material for processing industry (FAO, 2007).

Köy-Koop, with its 21 members, is active in fruits and vegetables, and cereals as well as in livestock production. Sub-unions operate the activities regarding milk collection, cooling, and quality check, and sales. They run the collecting centres where above mentioned activities take place. Milk is brought to collecting centres by producers or collectors. A large amount of the milk is sold to big companies in particular, which operate at a national level. Seasonal excess milk is distributed to mandiras mainly. Milk prices are determined by three months tenders organised by the union.

Hay-Koop supports livestock farming as well as poultry and bee keeping. Like Köy-Koop, Hay-Koop also operates through sub-unions. It performs on areas such as breed improvement, natural and artificial insemination, embryo transplant, genetic cloning, breeds Registration. It also provides inputs or equipment including animal feed, agricultural machines, tanks etc. for its members.

## 2.4.2. Production, consumption and trade developments

### 2.4.2.1. Production

The number of animals milked and the milk production trend were usually parallel to each other for a ten year period until 2003. Afterwards, while there was a decline in animal numbers, milk production increased. This displays that there has been an increasing trend in the productivity of holdings in recent years.

Cow number was 3.9 million in 2004 in Turkey. It increased to 4.2 million in 2006 while milk production was 9.6 and 10.9 million, respectively (Table 5).

Milk production in EU was 141.3 million tons in 2004, whilst the number of cows was 23.4 million (EU, 2006). Milk production in Germany and France, countries with approximately the same number of cows as Turkey, was 28.2 and 24.3 million tons. This indicates that there is a considerable gap in productivity between Turkey and EU countries.

Table 5 Trends in total (cow milk) production

	2000	2001	2002	2003	2004	2005	2006
Number of animals (000 cows)	5,280	5,086	4,393	5,040	3,876	3,998	4,188
Total cow milk production (000 tons)	8,732	8,489	7,491	9,514	9,609	10,026	10,867

Source: TURKSTAT, 2008b

Three regions: Aegean, West Blacksea, and West Marmora; provide 40% of the national milk production (Table 6). With respect to breed distribution, 45% of the animals are cross bred, while 26% of them are pure bred with a share of 40% in production. This indicates that the productivity of pure bred animals is high. Newly established firms in the livestock sector which utilise pure bred animals for production, and applied improvements in feeding and caring facilities are promising in terms of production increase in the future.

In Turkey, milk producers and holdings can be categorized into 4 classes (FAO, 2007):

1. Self-sufficient producers: they usually have 1-2 cows. They also produce cereals, animal feed, and fruit and vegetables. The quality of milk is generally low and consumed inside the holding, or sold in the domestic market.



2. Small producers with 3 to 10 cows: They are hardly above the self-sufficiency level. They can sell to the consumers who are close to them in terms of area. Some part of the milk is transferred to the collecting center, mandira, or another milk processing unit. Milk is usually of low quality. Other products are also produced. In certain occasions, farming is a part-time job for the producers in this category.
3. Professional milk producers with 10-50 cows: they are middle firms in size and expertise in milk production. In addition, they are relatively younger, and perform dairy farming commercially. They sell their milk to the processors.
4. Professional producers with 100 and more cows: Private and state farms are included in this category. They have expertise in milk production and sell their products to large scale milk factories. Milk quality is usually fine.

Development of the sector is restrained as the milk producers are usually in the 1st and 2nd group. Therefore, due to above mentioned reasons these holdings should sustain while the number of holdings in 3rd and 4 th groups increase significantly. (See. 2.4.1. Holding Structure).

Table 6. Cow milk production by region and by Breed (2006)

	Pure breed		Cross breed		Dom. breed		Total	
	000 ton	%	000 ton	%	000 ton	%	000 t	%
TR1 İstanbul	19	0.4	57	1.2	2	0.1	77	0.7
TR2 West Marmara	891	20.7	327	6.7	25	1.5	1,243	11.4
TR3 Aegean	1,029	23.9	659	13.5	102	6.1	1,790	16.5
TR4 East Marmara	368	8.6	303	6.2	48	2.9	719	6.6
TR5 West Anatolian	298	6.9	243	5.0	63	3.7	604	5.6
TR6 Mediterranean	445	10.4	558	11.4	45	2.7	1,049	9.6
TR7 Middle Anatolian	378	8.8	590	12.1	114	6.7	1,082	10.0
TR8 West Blacksea	307	7.1	657	13.4	292	17.3	1,256	11.6
TR9 East Blacksea	98	2.3	376	7.7	132	7.8	606	5.6
TRA Northeast Anatolian	116	2.7	660	13.5	386	22.9	1,163	10.7
TRB Middleeast Anatolian	263	6.1	300	6.1	250	14.8	813	7.5
TRC Southeast Anatolian	83	1.9	155	3.2	228	13.5	466	4.3
Total	4,295	39.5	4,885	44.9	1,687	15.5	10,867	100.0

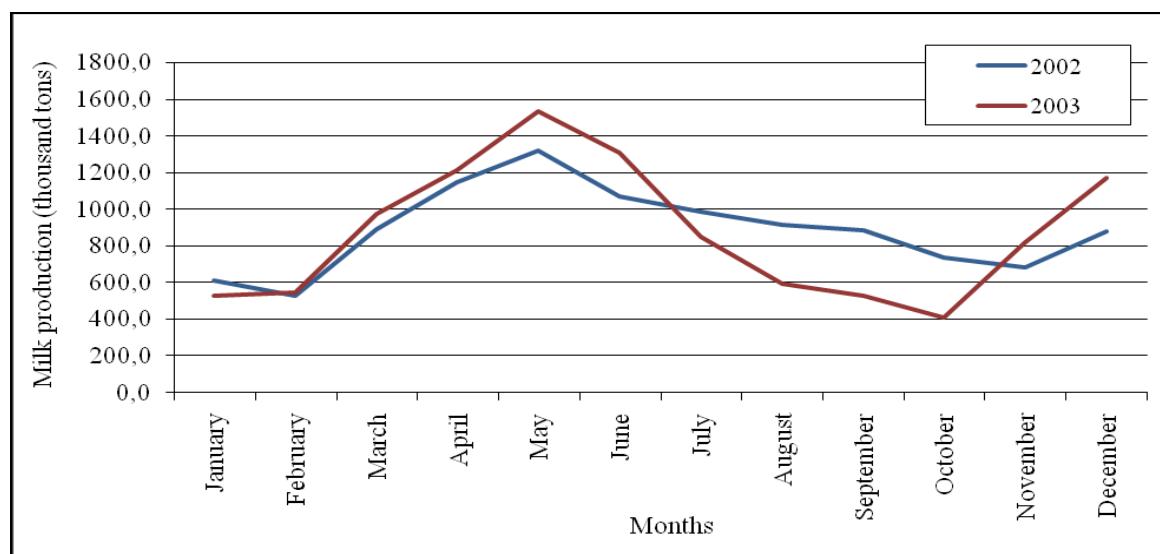
Source: TURKSTAT, 2008b.

### *Seasonal factors in milk production*

Milk production increases from February, peaks in May and gradually decreases afterwards (Figure 2). We see that there is a considerable seasonal fluctuation referring to average annual milk production. Main reason of the fluctuations is periodical concentration of births. Besides, quality and amount of fodder used in winter may influence milk production.

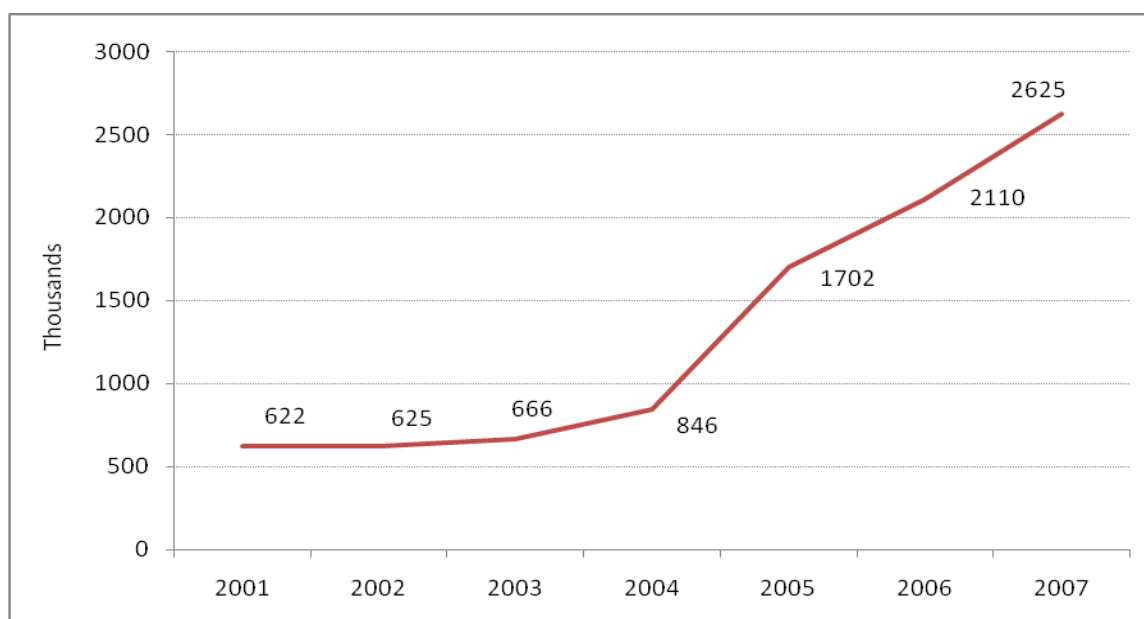
This fluctuating trend in milk production causes problems in the processing sector and makes pressure on the price. However, the milk powder diminishes the price effect of the fluctuations in milk production and becomes an important actor in balancing the supply and demand.

Increase in artificial insemination and its planning can decrease the problems regarding milk production considerably. Artificial insemination performed increased between 2001 and 2006. Accordingly, the number of artificial insemination increased from 622 thousand to 2.6 million in 2006 (Figure 3). The reason of this increase is the support given to the veterinarians per artificial insemination they performed. 62.7% of the dairy animals were inseminated artificially in 2006, which indicates an improvement on the matter.



Source: Calculated by the data of artificial insemination by AERI through the data obtained from TURKSTAT and TIGEM however, there is a serious problem with updating the data, in interviews with stakeholders, it is understood that not much changed.

Figure 2. Milk production per month



Source: DG-Agricultural Production and Improvement, 2008b

Figure 3. Number of artificial inseminations

### *Milk Quality*

Quality is perceived as the most important problem of the sector. Main indicators for the quality of milk are regulated with the declaration on Raw Milk and Heated Drinking Milk under the Turkish Food Codex. The criteria are in line with the

EU-criteria. (DG- Protect and Control, 2008).

The composition of the milk shall be:

	<u>Turkey</u>	<u>EU</u>
Protein, at least (%)	2.8	2.9
Fat, at least (%)	3.5	3.5
Fat free dry material (%)	8.5	8.5

The standards during milk collection shall be;

	<u>Turkey</u>	<u>EU</u>
Number of bacteria in total 30° C (per ml)	≤ 100,000	≤ 100,000
Number of somatic cells (per ml)	≤ 500,000	≤ 400,000

The most significant indicators that show the insufficient milk quality in Turkey are the high number of bacteria and somatic cells. According to the FAO report, the number of

bacteria in milk is over 1 million while the number of somatic cells is about 700 thousand (FAO, 2007).

The most important reasons for inadequate milk quality are as the problems in farm structure, insufficient caring facilities, lack of a well-organised cold chain, and substances such as water or residues of animal medicines found in milk.

Quality checks cannot be conducted efficiently by authorised inspection bodies - considering inadequacy of personnel and technical issues- due to high numbers of holdings and structural problems in Turkey. Inadequacy of technical circumstances such as laboratory conditions makes the problem worse. Another factor that makes it difficult to increase the milk quality is the fact that the poor quality milk can easily be sold in the market.

Factors that may increase the quality can be:

- To generalise price differentiation based on quality- which is widely used by the big companies during purchasing raw material,
- To improve organisational activities,
- To increase extension services which provide awareness and training,
- Technological improvement,
- To increase modern processing units or improve the current ones.

**Box 3. Sheep and Goat Milk**

It is very difficult to collect information about the sheep and goat milk sector in Turkey. Absence of specialised professional institutions and firms increase this difficulty (FAO, 2007). There were 25.6 million sheep in 2006 in Turkey and 97% of them were of domestic breed. The number of goats in the same year was 6.6 million and 97% of them were kil goat. Production of sheep and goat milk were 795 and 254 thousand tons, respectively.

**Sheep and Goat Numbers and Milk Production in Turkey**

	<b>2004</b>	<b>2005</b>	<b>2006</b>
Number of animals (1000)			
Sheep	25,201	25,304	25,616
Domestic	24,438	24,552	24,801
Merinos	763	752	815
Goat	6,610	6,517	6,643
Kil	6,380	6,284	6,433
Tiftik(angora)	230	233	210
Milk production (1000 ton)			
Sheep	772	790	795
Goat	260	254	254

Source: TURKSTAT, 2008b

The most important problems of sheep and goat milk production are the low level of productivity and seasonal variations. Milk derived from sheep and goat is mainly used for making white/pheta cheese. Milk production remains at low levels as a system for collection, processing and marketing of the milk does not exist. Accordingly, with a congruous production and marketing plan, the consumption of sheep and goat milk and its products can be raised. Sheep and goat feeding has a considerable advantage as it is performed in mountainous and arid areas where cattle feeding can not be performed. Consequently, an increase in investment together with an increase in support to these regions may improve sheep and goat farming.

It is suggested that Turkey has important advantages in sheep and goat production in terms of competitiveness in the livestock sector with its possible membership to the EU. Furthermore, countries with a high consumption of goat cheese, such as France, offers noteworthy advantages regarding export opportunities. Traditional products derived from goat and sheep milk may have several advantages in external markets.

**Box 4. The result of query presented to the producer firms of milk products**

Q: What are the main reasons for the low quality milk?

- A: - Seasonal variations in production
- Cold chain
  - Unfair competition arises from collectors and mandıras
  - The holdings are in small scale
  - Other (agricultural policies, education, price, unstable market etc.)

Q: What is the most important quality problem?

- A:
- High level of bacteria and somatic cells
  - Failure in cold chain
  - Substances such as water added in milk

Q: How can the quality be improved?

- A:
- Hindering the unfair competition
  - Considering quality in milk subsidies premium
  - Specialization in dairy production
  - Increase in controls and fines
  - Increase in investments
  - Organization
  - Improve Care and feeding facilities

Q: What is your recommendation in order to improve the current policies?

- A:
- Policies that regulate the market and increase the demand and the quality
  - Cooperation between public and private sector.
  - Promotion in investment
  - Seasonality in production should be decreased by production planning
  - Independent regional laboratory should be established.
  - Animal health application and medicine use should be regulated
  - National improvement program should be supported
  - Regions free from diseases should be established.

Q: What is the most important problem of the sector?

- A:
- Street milk
  - High collecting cost
  - Control
  - Organization, activities in establishing a National Milk Council should be finalized
  - Price fluctuation
  - Unregistered production and marketing
  - Lack of programs such as school milk
  - High input prices.

### 2.4.2.2. Milk supply / disappearance and consumption per capita

Total supply of milk increased gradually between 2004 and 2008. It is estimated that milk supply increased from 12.4 million ton to 13.9 million which means an increase of 12.1% between the above-mentioned periods (Table 7).

Production was estimated to rise by 7% and rose to 12.2 million tons. We see that almost the entire supply is met by domestic production. The self-sufficiency rate of milk and milk products is about 100%. The sector is not open to external trade and consumption per head is low compared to developed countries. The export ratio, which is between 0.1% and 0.3%, indicates that practically all production is consumed domestically. It is understood that milk production is considerably dependent on the domestic market conditions.

Table 7. Milk Supply and Disappearance in Turkey

	2004	2005	2006	2007 (d)	2008 (e)
<b>SUPPLY</b>	Ton				
Beginning stocks	990,172	1,217,614	1,267,640	1,238,105	1,172,581
Production (a)	11,438,141	11,686,319	11,903,957	12,087,531	12,217,108
Fluid milk and other use	1,467,197	1,489,500	1,509,449	1,524,543	1,539,789
Milk products (b)	9,970,944	10,196,819	10,394,508	10,562,988	10,677,319
Import (c)	202	160	52	62	78
<b>Total supply</b>	<b>12,428,515</b>	<b>12,904,092</b>	<b>13,171,649</b>	<b>13,325,698</b>	<b>13,389,767</b>
<b>DISAPPEARANCE</b>	Ton				
Total domestic disappearance	11,207,985	11,632,286	11,931,839	12,151,252	12,284,916
Export (c)	2916	4166	1706	1865	1,954
<b>Total disappearance</b>	<b>11,210,901</b>	<b>11,636,452</b>	<b>11,933,545</b>	<b>12,153,117</b>	<b>12,286,870</b>
Ending stocks	1,217,614	1,267,640	1,238,105	1,172,581	1,102,897
Stocks / use ratio (%)	10.9	10.9	10.4	9.7	9.0
Self-sufficiency ratio (f) (%)	98.0	99.5	100.2	100.5	100.6
(a) figures refer to cow and sheep milk together					
(b), (c) every kind of cheese, yoghurt/ayran, butter, ice-cream and milk powder (milk equivalence)					
(d) Estimation					
(e) Projected*					
(f) Self sufficiency ratio = production/ total supply					

Source: AERI, 2007

In 2008, 87 % of total supply is processed into milk products while 13 % is utilized as drinking milk or other (Table 8). The figures demonstrate a slightly increased share of the processed products in total dairy supplied, with cheese and yoghurt as main products.

Table 8. Milk products supply (thousand ton)

	2004	2005	2006	2007(a)	2008 (b)
Cheese	6,954.5	7,031.6	7,276.4	7,397.8	7,527.7
Yoghurt	2,297.9	2,268.9	2,281.0	2,295.7	2,317.7
Butter	1,337.2	1,476.4	1,527.1	1,554.9	1,566.5
Other	1,838.9	2,127.2	2,087.1	2,077.3	1,977.9

(a) Estimate

(b) Projection

Source: AERI, 2007.

Table 9. Consumption per capita\*

	2002		2003		2004		2005 (a)		2006 (b)	
	Kg/yr	%	kg/yr	%	kg/yr	%	kg/yr	%	kg/yr	%
Drinking Milk	21.0	12.8	21.0	11.9	21.0	12.7	21.0	12.7	21.0	12.5
Cheese	89.0	54.3	93.0	53.0	92.0	55.7	91.7	55.3	93.6	55.6
Yoghurt/Buttermilk	32.5	19.8	38.9	22.2	32.4	19.6	31.6	19.0	31.0	18.4
Butter	17.8	10.9	18.2	10.4	16.0	9.7	18.0	10.8	19.1	11.3
Milk powder	2.5	1.5	3.4	1.9	2.8	1.7	2.7	1.6	2.6	1.6
Ice Cream	1.0	0.7	1.0	0.6	1.0	0.6	1.0	0.6	1.0	0.6
Total Milk (c)	163.8	100.0	175.5	100.0	165.2	100.0	166.0	100.0	168.3	100.0

\*Milk equivalent

(a) Estimated.

(b) Forecast.

(c) All milk and milk products including drinking milk.

Source: Calculated by AERI based on TURKSTAT statistics.

<sup>b</sup> All milk and milk products including drinking milk.

Source: MARA

Average total milk consumption per capita in milk equivalents is 165 kg/year and a considerable share of this is consumed as cheese. The share of cheese in total consumption and consumption of cheese per capita was 55% or 91.7 kg/year in milk equivalents, respectively in 2006 (Table 9). Yoghurt and ayran with values of 32.4 kg (19.6%) and 21 kg (12.7%) follow cheese respectively.

While the consumption of fresh milk and milk products (liquid milk, yoghurt etc.) per capita is 36 kg/year in Turkey, it is 50 kg/year in the Netherlands, 27 kg/year in France and 7 kg/year in Italy. Consumption of cheese per capita is 26 kg/year in Greece, 20 kg/year in Germany and 10 kg/year in the U. K., whilst it is 9 kg/year in our country (FAO, 2006). According to these data, the consumption of fresh products is higher than the EU averages, but the cheese consumption in Turkey is not. Especially the younger and well educated part of the population consume the greater part of animal products, milk and milk products in particular. However, unequal income distribution, high prices and



despite the relative self-sufficiency the insufficient supplies hampers the potential level of milk consumption per capita.

In order to ensure that the product range extends, consumption habits of milk should be given to children and young people by projects like school milk, and measures should be taken that will encourage the investors for development of the milk processing industry.

#### **2.4.2.3. Trade**

The amount of export is not high as the products are not competitive in price or quality. Still, there is an increasing trend of export and import in all the dairy products.

Export of milk and milk products rose to 52 thousand tons in 2006 from 28 thousand tons in 2004 (Table 10). Cheese has the biggest share with 38% in export volume terms followed by whey and cream. Like the ranking by volume, the biggest share in export value terms is cheese, accounting for US\$ 43 million, followed by milk with US\$ 13 million and cream with US\$ 10 million. This indicates that although the volume of whey is high, it generates relatively low value. Further the price per unit of the product group of milk and cream is higher than for whey. Similarly, ice-cream exports also increased in recent years and the contribution of foreign investment to this increase is considerable (CEEC AgriPolicy, 2006).

### **Box 5 EU Dairy Policy**

EU Dairy Policy, covering plenty of products which are defined in Art.1 Regulation No 1255/1999<sup>1</sup>, operates in internal market, trade and direct payments to farmers. Its instruments involve decoupled payments, intervention price, import quotas, export subsidies, domestic production and consumption subsidies, as well as domestic production quotas. These instruments are operated by Common Market Organisation (CMO) which was established in 1968 under the Common Agricultural Policy (CAP). The CMO mainly seeks to balance supply of and demand for dairy products<sup>2</sup> (fact sheet). However, the 2003 CAP reform and the ongoing WTO negotiations led the EU to liberalize its dairy policy to a certain extent; the aim of keeping supply-demand balance stayed the same.

Today, the EU supports its dairy sector in internal market through (safety-net) intervention, disposal of dairy products, private storage aid and (Domestic) Milk quotas. After the 2003 CAP Reform the levels of support for Dairy Sector were altered. With the 2003 reform, the intervention price for butter was reduced by 25%, beginning on 1 July 2004 for a four-year period (fact sheet). Besides, the intervention threshold for butter was reduced for the previous years and it will be in subsequent years. The dairy premium paid in order to compensate the cuts in intervention price turned to 'Single Payment Scheme' (SPS), which was first introduced by the 2003 CAP Reform. It is a decoupled payment and conditional on the fulfillment of 'Cross Compliance'. When it comes to trade, the EU subsidized its dairy market as the price of milk was higher than the world price. However, after the Uruguay round these subsidies are restricted. The EU protects its dairy market through high tariff rates. Import of butter is performed under the Tariff Rate Quotas (TRQ).

Following the 2003 CAP reform, the EU initiated the "Health Check" in November 2007 which envisages a set of changes aiming to simplify Single Payment Scheme; to adjust market support instruments including an increase in the quota amounts of the countries till 2015, the quota abolish date; and searching procedures to challenge the changing conditions such as climate change, or benefit the opportunities. It will affect the Dairy Sector, as well. The abolition of the quota regime in 2015 is one the subjects that is being mainly considered in the EU. A soft landing is proposed under the health check. Within this prospect and due to the increasing demand for dairy and dairy products both within the European Union and on global markets, the EU Commission recommended increasing domestic quotas with 2 %, beginning on April 2008.<sup>3</sup> This proposal has been approved on 17 March 2008.

---

<sup>1</sup> The basic regulation in the milk sector on the Common Market Organisation for Milk and Milk Products.

<sup>2</sup> EU Commission, DG-Agriculture and Rural Development, "Milk and Milk Products in the European Union", Fact Sheet, August 2006

<sup>3</sup> <http://europa.eu/rapid/pressReleasesAction>

Table 10. Trade of Turkey in Milk and Milk Products

	2004		2005		2006	
	Amount 1000 ton	Value 1000 \$	Amount 1000 ton	Value 1000 \$	Amount 1000 ton	Value 1000 \$
<b>Export</b>	<b>22,962</b>	<b>40,696</b>	<b>39,222</b>	<b>64,593</b>	<b>51,871</b>	<b>94,267</b>
Milk and Cream	3,426	4,208	5,386	7,159	8,390	13,466
Buttermilk, cream, yoghurt, etc.	345	357	2,282	2,171	5,131	5,306
Yoghurt (concentrated)	329	318	2,225	2,023	1,796	4,974
Whey	5,276	2,734	11,672	6,883	14,667	9,997
Fats derived from milk	76	286	99	456	105	527
Butter	47	162	56	238	55	289
Cheese and Curd	10,672	27,772	13,484	37,869	17,396	48,743
Ice-cream etc.	2,790	4,858	4,018	7,794	4,331	10,965
<b>Import</b>	<b>27,651</b>	<b>66,075</b>	<b>29,167</b>	<b>76,866</b>	<b>35,802</b>	<b>87,190</b>
Milk and Cream	12,084	25,426	9,899	23,315	16,852	38,764
Buttermilk, cream, yoghurt, etc.	338	502	260	435	8	21
Yoghurt (concentrated)	335	478	256	421	4	7
Whey	535	1,632	391	1,583	539	1,538
Fats derived from milk	4,294	10,209	6,193	14,687	6,328	12,994
Butter	4,269	10,160	6,155	14,596	6,228	12,736
Cheese and Curd	5,366	16,517	5,228	20,034	4,620	16,454
Ice-cream etc.	431	1,150	784	1,795	1,223	4,676
<b>Net Export (NE)</b>	<b>-4,689</b>	<b>-25,379</b>	<b>10,055</b>	<b>-12,273</b>	<b>16,069</b>	<b>7,077</b>

Source: İGEME, 2007

The main destinations of Turkish exports of milk and milk products are the close neighbors such as Turkish Republic of Northern Cyprus, Middle East, and Turkic Republics (İGEME, 2007). EU countries do not have a noteworthy place in export of milk and milk products. However, Turkey has an important potential for export of its traditional products to the countries like Germany where Turkish population is dense.

Import of milk and milk products of Turkey in 2006 was about 36 thousand tons (87 ml \$) and nearly 40% of it was made in the milk and cream group. This is followed by butter, other fats derived from milk and cheeses. Turkey's main import partners are EU countries, France, and Germany in particular, Ukraine and Turkish Republic of Northern Cyprus.

Due to high customs duty, a considerable amount of milk products are imported under the Inward Processing Regime, and are exported after being processed (DPT, 2005). Milk

powder is a very good example because it is imported in order to produce the products to be exported.

The net export will be affected by EU-Accession. Trade liberalization with the EU will enhance imports more than exports, especially in livestock products, though Turkey could still be a significant net exporter of agricultural products. With no trade restriction with the EU, livestock imports will increase considerably. Livestock production will decline as the largest price falls following trade harmonization will be experienced in the livestock sector (CEEC, 2006).

Instead of focusing on the Imports & Exports, Turkey should be better advised to focus on its own domestic market (FAO, 2006).

#### 2.4.2.4. Government Policies

There are several support tools that aim to increase the milk production directly or indirectly. The most important one among these is the milk subsidy. Milk subsidy (base support), initiated in 1987, was 3 Ykr/Lt in 2007 (i.e. 6 to 7% of average price, see table 11). Since premium payments support the production directly and are given only to the processing sector, the informal sector declines while the production is increasing.

In addition to the premium implementation, some other support measures aiming at supporting cattle farming and the related amount of payments are illustrated in Table 9.

Table 11 Certain supports for cattle farming (2005)

Subject of the Support	Amount
Dairy Support (Base)	3,0 Ykr /lt
Producer- if member of an organisation	5,5 Ykr/lt
Additional support to farmers contributing to the Ministry's improvement activity by registering their animals	1,5 Ykr/head
Additional support if advisor (Agricultural Engineer, and Veterinarian) is employed in producer organisation	1,5 Ykr/head
Artificial Insemination	
Priority provinces subject to development	36,0 YTL/head
Other Provinces	26,0 YTL/head

Source: DG-Agricultural Production and Improvement, 2008a

Feeding crops support had the biggest portion among the livestock support in 2005 with a ratio of 24%. This is followed by milk subsidies and market organization. Breeding with licensed stud/animal, and milking hygiene and milk quality payments have the smallest shares with 0.8% and 1% respectively.

As it is displayed in the table, there are many different supports aiming to promote the livestock sector. High numbers of these tools disperse the system and create enforcement problems. A single support system replacing these tools prevents the difficulties that emerges from the system itself and dissipation of sources.

The dairy industry in the EU is heavily supported and milk producers in Turkey will benefit of these supports in a possible membership.

Table 12 Dairy Farming Support (2007)

<b>Subject of the Support</b>	<b>Value (thousand YTL)</b>	<b>Share in total animal support (%)</b>
Stud with license	2,475	0.3
Artificial Insemination Support	25,572	3.5
Calf born by artificial insemination	25,731	3.6
Plant for feed	412,589	57.1
Milking hygiene and milk quality support	5,767	0.8
Milk Subsidy	177,487	24.6
Holdings Free from Animal disease	11,540	1.6
Combat with diseases	2,374	0.3
Food safety	1,136	0.2
Animal Identification System	2,135	0.3
Genetic animal sources	3,006	0.4

Source: DG-Agricultural Production and Improvement, 2008b

### **3. COMPETITION ANALYSIS**

#### **3.1. Quantitative measures of competitiveness at the macro level**

Despite the increase in agricultural support in recent years, a reasonable level of production still cannot be achieved in Turkey. Yet, the increase in different products such as maize and milk is significant.

The effect of government support measures on competitiveness is an important issue to be concentrated on. “Single Commodity Transfer (SCT)” and “Nominal Protection Ratio

(NPR)” are two of the criteria, calculated for consumers and producers separately, displaying these effects. Producer SCT was 1,181 million YTL while consumer SCT was 1,276 million YTL in 2006, in Turkey (Table 13), which indicates that the transfers from consumers to dairy farmers (because consumer prices are higher than they would have been without government policies) are higher than the government support of producers. Furthermore, it displays that milk producers in Turkey generate a considerable amount of their income from supports, market-price support in particular. In EU-25, producer SCT was 9,958 million €. (OECD, 2007). The latter indicates that 23.1% EU’s dairy farmers’ gross receipts were linked to government support transfers. In Turkey, this share was 22.7%, which indicates that the two are similar considering the producers transfers.

The NPR in 2006 for milk producers was 1.35, whilst it was 1.31 for consumers. These figures indicate that the milk prices in Turkey were 31-35 % higher than the reference price or international prices. Figures for the EU were 1.31 and 1.29 respectively (OECD, 2007).

Net Trade Position (NTP), denoting the difference between export and import, is also an important indicator regarding measuring the competitiveness. Table 13 indicates that Turkey was a net dairy exporter in volume terms in 2005 and 2006 and a net importer except the year 2006 in value terms (see Table 10). However, one may not forget that Turkey has been developing according to domestic market conditions. Possible membership of Turkey to EU may cause significant disadvantages in terms of NTP.

Table 13. Competitiveness Indicators for Milk Sub-Sector

	2004	2005	2006
Producer SCT (million YTL)	1,746	1,449	1,181
% SCT	31.8	25.8	22.7
Consumer SCT (million YTL)	-1,939	-1,640	-1,206
Producer NPR	1.56	1.45	1.35
Consumer NPR	1.54	1.42	1.31
NTP (million YTL)	-25	-12	7
Openness to external competition	0,0003	0,0004	0,0002

Source: OECD, 2007; TEAE calculations

Coefficient of openness to external trade is considerably low in milk sector. This indicates that milk and milk products sector is not open to external markets enough and amount of import can be negligible within the domestic demand.

### **3.2. Farm level competitiveness**

#### **3.2.1. Average yields per cows**

There has been a significant increase since 2004 in the yield per cow while the number of animals decreased in recent years. The yield in 2003 was nearly 1.9 ton/head/year and increased to 2.5 tons/head in 2004 and 2005 (Table 14). The average yield in EU is over 5 tons/head/year (EU, 2008).

The yield difference between Turkey and the EU is still far too large and demonstrates that Turkey is not able to compete with the EU in the current situation. Thus, measures should be taken in order to achieve at least the EU production level.

The factors that raise the yield are livestock support besides the improvement of cattle farming. However, the high share of animals with domestic breed in total animal number negatively influences the success of these activities. Accordingly, activities towards raising the yield, notably the breed improvements, should steadily continue. Another factor that is embarrassing the improvement of the sector is the significant differences among the regions and firms. Besides, it affects the average milk yield considerably negative.

The yield is high or even very close to the EU members and other developed countries' average in modern companies and western regions where cattle farming is intensively performed, whilst it is too low in eastern regions and in firms producing with traditional methods. For instance, the average yield of holdings registered to DSYB is 6 tons/year, while the average yield of Turkey is 2.5 tons/year. The main reason for the above mentioned difference is that the herd structure in the holdings, except the modern ones, is mainly composed of domestic breed and the care conditions are not good enough.

Another problem regarding milk production and productivity is the regional disparities and differences between the species. For instance, annual average milk yield is 2.6

ton/head in pure bred, 2.7 tons/head in cross bred and 1.3 tons/head for domestic bred cows (Table 15). This demonstrates that despite its partial minority in total animal number, pure bred cows are significantly advantageous in terms of deriving yield, and their number is required to be increased considering next decades.

Table 14 Yield (Kg/head/year)

	<b>Cow</b>	<b>Buffalo</b>	<b>Sheep</b>	<b>Goat</b>
2000	1,654	967	49	58
2001	1,669	969	49	58
2002	1,705	986	48	59
2003	1,888	850	62	89
2004	2,479	998	78	105
2005	2,508	996	78	105
2006	2,595	1,005	78	105

Source: Calculated by AERI through TURKSTAT data

Regional figures show that yield decreases from west to east. For instance, it is 3.2-3.4 tons/head in West Marmora and Aegean Regions where dairying is performed under better conditions, while it is 1.8-2,3 tons/head in East and Southeast Anatolian Region.

Table 15. Milk Yield by Region and Breed (Kg/Head/Year) (2006)

	<b>Pure</b>	<b>Cross</b>	<b>Domestic</b>	<b>In general</b>
TR1 İstanbul	3,922	2,621	1,364	2,794
TR2 West Marmora	3,950	2,722	1,283	3,403
TR3 Aegean	3,942	2,729	1,311	3,084
TR4 East Marmora	3,890	2,675	1,324	2,944
TR5 West Anatolian	3,953	2,671	1,311	2,817
TR6 Mediterranean	3,866	2,686	1,276	2,925
TR7 Middle Anatolian	3,856	2,732	1,351	2,717
TR8 West Blacksea	3,862	2,682	1,322	2,302
TR9 East Karadeniz	3,780	2,743	1,334	2,315
TRA Northeast Anatolian	3,704	2,823	1,326	2,089
TRB Middle east Anatolian	3,612	2,633	1,325	2,167
TRC Southeast Anatolian	3,694	2,653	1,273	1,792
Total	3,881	2,715	1,316	2,595

Source: Calculated by the researchers based on the data displayed in Table 4 and Table 6.



### **3.2.2. Milk prices and gross margins at the farm level**

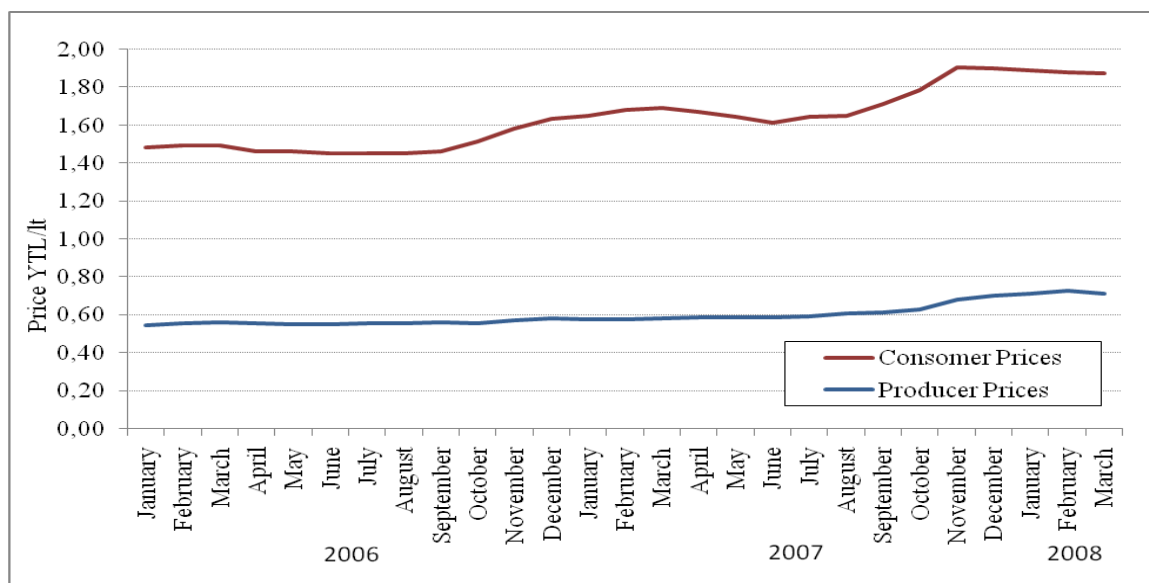
Indicators illustrating prices and quality of products, costs of production and gross margins are important for evaluating competitiveness of the sector.

#### ***Evolution of production and consumption price trend***

Price developments between 2001 and 2006 show that producer price increased by 30% and consumer price increased by 25.4% on an annual basis (Turkstat, 2008c). The reason of this considerable increase was the decline in milk yields, difficulties in usage of feed related to price conditions and drought. Furthermore, increase of consumption of milk products despite the high prices of milk powder and limited world supply caused prices to rise (TZOB, 2008)

Another interesting issue regarding the price trend since 2006 is the relatively constant producer price over most of the period 2006 and 2007 while consumer prices show an increasing trend since the end of 2006 to (at least) November 2007 (Figure 4). Producer prices only went up in the second half of 2007. Further, these data indicate that consumer prices are more fluctuating than producer prices and at a (much) higher level than the producer price.

Tenders under free market conditions determine the reference milk price in Turkey. These tenders are held in Burdur, Çanakkale (Biga) and Balıkesir (Gönen) as the milk industry is mainly concentrated in west Marmora and Aegean Region, and production among the region is usually performed for the industry.



Source: TURKSTAT, 2008c

Figure 4 Evolution of producer and consumer prices of milk (January 2006-March 2008)

At the tenders, producer organisations (representing farmers) and (mainly large scale) purchasing firms gather and negotiate about the price and the volume. Written contracts settle the deal. These prices set are accepted by other farmers and firms in the country as reference prices. However, price disparities among the regions arise because the industry is concentrated in particular regions, and remote producers can not transfer their products to them. Hence, producers market their milk in closer areas even if milk prices offered by the nearest dairy plant is (much) lower than the reference price. Still, organisations such as cooperatives and extension of industry in other regions may lead to an enhanced bargaining position of farmers that may result in higher producer prices.

However, producer price differentiation according to quality, which is part of the EU pricing mechanism, is used by certain industrial firms in Turkey. Rarity in usage of this tool limits the increment of the producer income and the improvement of production in terms of both quality and quantity. Measures that can be effective in eliminating negative impacts on price may be establishing an intervention mechanism like in the EU, applying a support system that promotes productive and quality milk production and encouraging milk production as the main economic activity.

### *Price Differentiation*

In the EU, price differentiation based on quality was set as obligatory under the regulation 1971/1411. However, this obligation was abolished as it became common practice. Such an application does not exist in the Turkish legislative system. On the other hand, certain firms apply price differentiation based on quality, or specific criteria which can be categorised into four:

1. Absence of differentiation based on quality: Domestic or mainly regional processing firms prefer this highly common application however; it is known that certain national processors also use it.
2. Practice of premium based only on quantity of the milk: Beside domestic and regional firms, national ones may also pay premia. The practice includes subsidising the producers who produce at the amount determined by the firm, or above it. It helps processing firms to reduce their milk collection expenses. Furthermore, technical equipment including cooling tanks or milking machines can be provided by the buyer firms to whom perform milk production in high amount. Producers who can produce milk on large scale already have these facilities as they have scale advantages. Consequently, quality of the milk produced by these producers is higher than the rest.
3. Practice of premium based on biological and chemical quality, beside quantity of the milk: It is a system which is usually used by firms performing at national level. Premium is given not only according to biological quality of the milk but also chemical characteristics such as fat, or protein. Premium system under that category fully rewards the production of quality milk. Accordingly, producers endeavour to improve the quality of their milk in order to benefit from the practice. Producers in Tekirdağ and Kırklareli are good cases to that.
4. Practice of premium covering the structural features of the holding: Premium is given not only according to the quality of the milk but also certain features of holdings depending on its possession of a cooling tank or a related investment; freedom from diseases; or practicing registration in line with the Regulation of 253/2004/EC and 254/2004/EC. It is applied by certain firms produce at national level.

**Box 6. Pricing Practice of Firm A Based on Quality**

Below is the pricing practice of Firm A based on quality, which performs in milk products sector:

**Fat:** On the basis of the ratios 3.6% for winter and 3.5% for summer, premium is allocated under or above the figures. (0.005 YTL/lit)

**Protein:** On the basis of the ratios 3.4% for winter and 3.3% for summer, premium is allocated under or above the figures. (0.005 YTL/lit)

**Number of bacteria:** Fine is taken for above 100 thousand bacteria, and premium is given under 100 bacteria on the basis of Food Codex. (0.025 YTL/lit)

**Number of somatic cells:** Fine is taken for above 400 thousand bacteria, and premium is given under 400 bacteria on the basis of Food Codex. (0.025 YTL/lit) **Freeness from diseases and registry certification:** registration and Certification Premium is given to producers who document that their holding is free from diseases stressed in Turkish Food Codex, tuberculosis and brucella, and keep record in line with the regulations 853/2004/EC and 854/2004/EC. (0.025 YTL/lit)

**Standardisation:** Standardisation premium is given to producers who transform the environment of the cooling tank into the conditions in line with the food codex. (0.010 YTL/lit)

**Quantity:** Quantity premium is given in order to encourage milk amount per holding. (0.020 – 0.150 Ytl/lit)

**Cooling:** A premium is given to producers who possess their own cooling tank in order to support the producers for cooling tank investment. (0.010 YTL/lit)

**Box 7 Cattle Breeders' Central Association (CBCA)**

Cattle Breeders' Central Association (CBCA) has been founded in 1998 as a superior board to the unions which were established in 1995. 69 unions are members of CBCA and employ around 300 veterinarians, experts and 300 administrative personnel.

Approximately 5.5 million cattle are registered to CBCA (1.3 million in herdbook, more than 4 million in pre-herdbook). Farmers with 5 pure bred cows or more are registered in the herdbook, but most small breeders are not registered. In total 52,000 farmers are registered in the herdbook. They have 620,000 milking cows and in total own 1.3 million animals. Each cow's milk yield is registered but no information on fat and protein. There are around 100,000 dairy farmers with 5 cows or more.

Main aims of CBCA are to increase the contribution of cattle breeding activities to the national economy and the profit of livestock activities, and to improve the knowledge base and skills of farmers to increase produce both in quantity and quality.

*Activities of CBCA* are composing the herdbook of cattle, registration of cattle, control of registry, artificial insemination, consultancy, sale and buying of the animals and marketing of their products, providing of animal health services, representation of the members in national and international arena, education and publishing.

Incomes of CBCA comes from entrance fees, membership fees (once in a year) and charge of services (for per animal) and these are equal to 50 kg/year milk value. CBCA plays role in transferring governmental subsidies for the dairy sector to the farmers who are registered in the herdbook.

In 2007 CBCA started a project to collect milk prices and production costs from its members in cooperation with IFCN (International Farm Comparison Network).

In the interview at CBCA headquarters, it was indicated that the price of milk was determined by tender which was organized by unions in Marmora. But this price is not for whole country and there are big differences among regions or cities. For example, milk price can be 0.50 YTL/kg in Marmora, but the price for the same item can be 0.33 YTL/kg in another region. Besides, some firms offer a cooling premium.

In the dairy market, industrialists are more powerful than the farmers. The way of increasing the bargaining power of farmers is to be organized and to own processing units.

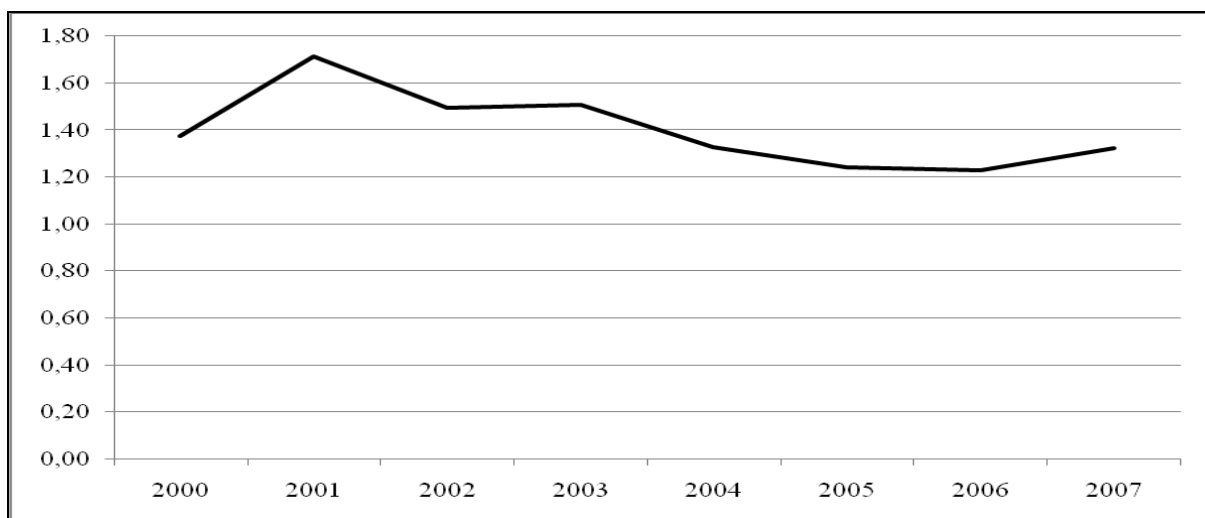
The main factors that can develop milk and milk products market are the constitution of the price according to the quality, enhancing producer organization, and establishing big enterprises which have competition power.

### *Milk / feed ratio*

The milk/feed ratio should be at 1.5 to catch up the breakeven point according to stakeholders. In other words, 1 kg milk should be able to purchase 1.5 kg compound feed.

The ratio peaked at 1.7 in 2001, and fell to 1.2 in 2006 and rose to 1.3 in 2007 again in connection with the rise in milk price (Figure 5).

The most important reason of the decline in the parity was the rise in feed price due to the rise in exchange rate which was affected by the crises experienced. However, today, the reason is the increase in usage of the maize as biofuel due to drought and the rise in price of raw material of the feed in international markets in connection with the increase of animal production. This is very important considering the fact that the import of raw material for the feed is high in Turkey which directly affects the milk/feed ratio.



Source: Calculated by AERI through TURKSTAT data.

Figure 5 Development in Milk/Feed Ratio

### *Gross margin*

Profitability is one of the most important criteria in terms of evaluating the activity of milk production. Gross margin calculation is widely used in order to indicate profitability. At this level of the report, gross margin results are calculated by the average efficiency of dairy holdings producing with modern methods which are registered by DSYB. These

calculations are compared with those for Turkish average milk yields. Gross margin of production activity in the holdings of DSYB members is 30.1 Ykr/lt while gross margin per cow is 1,808 YTL/head, according to the calculation (Table 16).

Table 16 Gross Margin in Milk Production Activity (2007)

	<b>DSYB avr.</b>	<b>Turkey avr.</b>	<b>Turkey avr.**</b>
Milk yield (lt/yıl) (1)	6,009	2,508	2,508
Milk price (YTL/lt) (2)	0.42	0.42	0.35
Milk support(YTL/lt) (3)	0.07	0.07	0.07
Revenue (YTL)			
Milk sale (1 x 2)	2,523.6	1,053.36	877.80
Milk support (1 x 3)	420.6	175.56	175.56
Calf	300.0	300.0	200.0
Fertilizer	24.0	10.0	10.0
Total revenue (4)	3,268.1	1,538.92	1,263.36
Variable expenditure (YTL)			
Feed expenditure	1,238.0	506.0	506.0
Roughage	18.0	18.0	18.0
Compound feed	1,220.0	488.0	488.0
Veterinary and medicine expenditure	43.3	43.3	43.3
Artificial insemination	25.5	25.5	25.5
Water and electricity	149.4	149.4	149.4
Tools and machinery expenditure	4.7	4.7	4.7
Total variable expenditure (5)	1,460.9	728.90	728.90
Gross margin calculation			
A. milk revenue per 1 lt (4 / 1)	0.54	0.61	0.50
B. variable cost of milk per 1 lt (5 / 1)	0.24	0.29	0.29
C. gross margin of milk production 1 lt (A-B)	0.30	0.32	0.21
D. gross margin per cow	1,807.22	810.02	534.46

\* Figures were calculated per head referring to the holdings that have 5 animals registered to breed file by 2006

\*\* Calculation based on the assumption that differences in milk quality, and price of calf and milk.

Source: CBA; AERI, 1999; KKGGM (DG-Protect and Control of MARA), 2007.

The average milk yield for Turkey is nearly 2,508 while it is 6,009 lt/year/head for the holdings that make a base for these calculations. In consequence, gross margin rises to 32,3 Ykr/lt while gross margin per cow considerably decreases to 810 YTL/head in connection with yield considering Turkey average.

It is assumed that calf price is the same in both calculations besides milk quality and price. Yet, there are considerable differences between animals with high yields and the

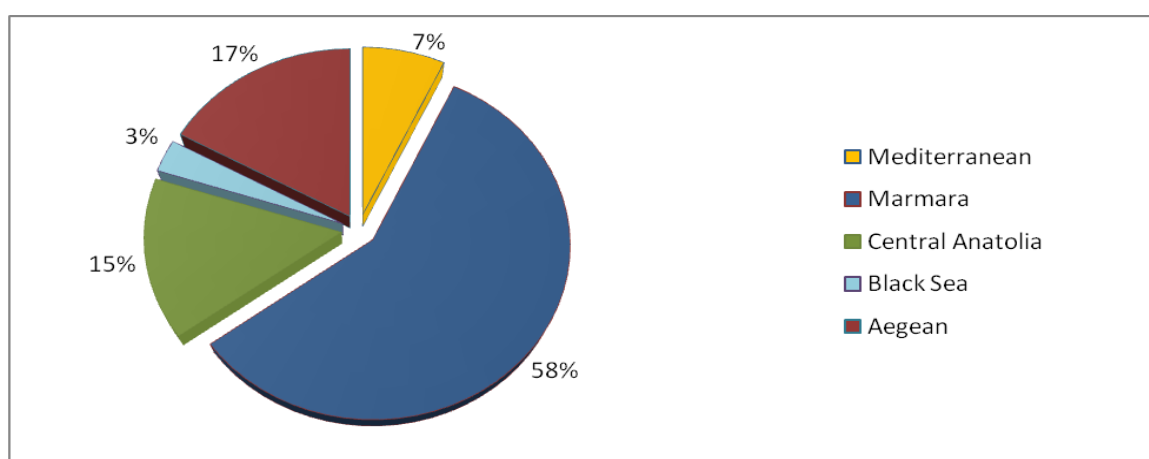
others. Thus, the milk price should also be different. Gross margin per liter and gross margin per cow becomes 21.3 Ykr/lt and 534 YTL/head, respectively under the assumptions of 35 Ykr/lt of milk price and 200 YTL/head of calf price.

Consequently, these calculations display that there may be efficiency differences in dairy holdings in Turkey which influence the performance of the milk production, and also the profitability in milk production is usually low. Profitability can also double or triple with the increase in yield. Thus, the activities aiming to raise the yield will raise the profitability, as well.

### 3.3. Performance of the dairy industry

#### 3.3.1. Geographical dispersion

There are now 2,299 holdings active in the dairy sector, according to TOBB sources (TOBB, 2007). 58% of these firms accepted as firms with high processing capacity of 50 tons/day are located in Marmara Region, 15% of them are in Aegean Region, 15% are in Middle Anatolian Region, 7% of them are in Mediterranean Region, and 3% of them are in Blacksea Region. (Figure 6) (FAO, 2007). This expresses that most of the enterprises are located in Western Regions, thus there is a geographical concentration in terms of establishment places.



Source: FAO, 2006.

Figure 6 Dispersion of Processing units (>50 tons/days capacity) in respect to regions (2005)

The geographical dispersion of processing units is also meaningful in respect to the dispersion of cattle farms. As a matter of fact, holdings producing for the industry are



mainly located in Aegean, Marmora and Thrace Region. Potential in the production of milk and milk products in east and southeast region, where livestock activities can be performed in a wide area, can not be utilized enough due to the very limited presence of processing units. However, factors such as the low quality and productivity of milk or widely performed goat or sheep farming make new processing units to be established difficult. Furthermore, establishment of milk processing industry formations in provinces of East and Southeast Regions are positive improvements in terms of the sector's future and utilizing its current potential.

### **3.3.2. Capacity Utilization**

There is a concentration in allocation of processing units of milk and milk products referring to their capacities. Accordingly, most of the holdings are middle scaled while a small number of them are big scaled integrated ones that produce in significant amounts and provide a considerable part of the production.

Low capacity utilisation is one of the most important problems of the sector. For instance: capacity utilisation ratio is 15% for processed drinking milk, while it is 25% for white and kaşar cheese (DPT, 2007). Insufficiency of raw material due to seasonal variations, and problems with the quality of the raw material are the main reasons of the problem. In addition, the abundance in the number of holdings may cause low capacity utilisation.

As the biggest part of the sector consists of small and medium firms, high operation and product cost problems arise, besides technological inadequacies. Accordingly, price of milk and milk products fall down depending on the increase of the current processing capacities or increasing the number of big companies and this may provide the demand for milk and milk products to rise. With respect to increasing capacity utilization rate, investments in processing industry besides contracted production may be effective.

### **3.3.3. Employment**

As the size of the majority of the processing units are small and medium, the employment rate in dairy sector is also low. For instance, there are less than 10 people working in 77% of the holdings, whilst only 1% of the holdings employee more than 100 people (Table 17).

Table 17. Distribution of dairy industry by size, in number of employees

Numbers of employees	Number of enterprise	Ratio in all enterprises (%)
1-4	694	30.2
5-9	1,072	46.6
10-19	311	13.5
20-49	157	6.9
50-99	26	1.1
101-841	39	1.7
Total	2,299	127.0

Source: TOBB, 2007

### 3.3.4. Product prices and value added in the processing industry

A value added is created when an agricultural product, as a raw material, is turned into processed products. Thus, after the milk is processed into products such as cheese, yoghurt or butter milk, a value is added to the milk.

The average price of the raw material bought from the producer is 0.45 YTL/Kg referring to interviews with stakeholders. Prices of the processed milk vary according to its kind. For example, the price of the pasteurized milk is 0.76 Ytl/Kg, whilst the prices of the yoghurt and cashar are 1.22 Ytl/Kg and 6.29 Ytl/Kg, respectively. As shown, a significant amount of value added on milk by processing is created which is varying related to its kind. Furthermore, the firm sells its products with 10-15% profit. However, it is also specified that bigger firms sell their products with a profit margin that ranges between 25 and 30%.

### 3.3.5. Investment

Low consumption level in the country increases the interest of both domestic and foreign investors to the milk processing industry. On the other hand, structural problems of the sector such as seasonal variations in production and high production cost restrain the investments. Still, the number of domestic and foreign investments in dairy farming and milk products industry gradually increased.

However, major part of the foreign investors in the sector concentrates on ice cream production. There are investments also majoring in the production of other milk products

and livestock sector. Foreign firms prefer partnership mainly with domestic firms as they have investment facilities and distribution channels.

### **3.4. Concluding remarks on competitiveness of the Turkish dairy industry**

Although, some portion of the entrepreneurs producing milk has the ability to compete with the EU, yet big part of the entrepreneurs has many disadvantages. Most of the cattle farms producing milk are very small. Another disadvantage is the production which is unfruitfully maintained with domestic or cross breed bred. This weakens the producers' position in the market.

The competitive position of small and medium size processors is not strong compared to big ones. This also negatively influences the competition structure of the market. Furthermore, factors such as street milk, food safety and unregistered production is embarrassing the competition in the market.

Yield and milk quality should be improved for abolishment of above mentioned disadvantages regarding competitiveness. Other factors that can enhance the competition structure are a better planning of supply which may lead to provide a more stable production of milk throughout the year, establishing a price system promoting milk production with high quality under hygienic conditions, diminishing structural problems of holdings performing milk production, raising capacity utilization ratio to 70-80%, encouraging consumption of quality milk, economising on costs, notably feed, and ensuring the rise of production for export.

#### 4. SWOT ANALYSIS

Table 18. Strengths and weaknesses of the Turkish dairy sector

Stage	Strengths	Weaknesses
Market/macro environment	<ul style="list-style-type: none"> <li>a) Large market with 70 million consumers</li> <li>b) Big firms usually have their own distribution systems</li> </ul>	<ul style="list-style-type: none"> <li>a) Fragmented market structure, too many producers and processing units</li> <li>b) Lack of market regulation</li> <li>c) Conjectural fluctuations on general economic conditions</li> <li>d) Unregistered production of fresh milk and milk products</li> <li>e) Low consumption per capita</li> <li>f) Weak producer position</li> <li>g) High distribution cost for small and medium size producers or not having such a system.</li> </ul>
Farm level	<ul style="list-style-type: none"> <li>a) Low labour cost,</li> <li>b) Using generally family labour for animal activities</li> </ul>	<ul style="list-style-type: none"> <li>a) Low genetic potential,</li> <li>b) Seasonal variation in production,</li> <li>c) High input cost, feed in particular</li> <li>d) Physical problems, such as low mechanization, barn conditions etc</li> <li>e) Inadequate capital</li> <li>f) Low productivity and profitability</li> </ul>
Processing industry	<ul style="list-style-type: none"> <li>a) High profit ratios</li> <li>b) High competitiveness of big companies as they have high production capacities and their own marketing channels power</li> </ul>	<ul style="list-style-type: none"> <li>a) High costs</li> <li>b) Scale of enterprises, high numbers of small or medium scaled milk processing enterprises</li> <li>c) Low competitive power of small and medium scaled enterprises</li> <li>d) Low milk quality</li> <li>e) Insufficient raw material</li> <li>f) Usage of old technology,</li> <li>g) Low capacity utilization</li> </ul>
Street milk	<ul style="list-style-type: none"> <li>a) Low price,</li> <li>b) Easy service,</li> <li>c) Traditional consumption pattern, and consumer custom</li> <li>d) Easy service advantage</li> <li>e) High competitiveness</li> </ul>	<ul style="list-style-type: none"> <li>a) Low quality</li> <li>b) High usage of labour</li> <li>c) Inadequate legal regulation and control</li> </ul>
Supermarkets	<ul style="list-style-type: none"> <li>a) Wide product range</li> <li>b) Easy access</li> <li>c) Well organized structure</li> <li>d) Cost advantages</li> </ul>	

Table 19 Opportunities and threats of the Turkish dairy sector

	Opportunities	Threats
Market	<ul style="list-style-type: none"> <li>a) Increasing population and high share of young people in population</li> <li>b)Willingness to pay for milk products and other animal products</li> <li>c) Income increase</li> </ul>	<ul style="list-style-type: none"> <li>a) Low purchase power of consumers</li> <li>b) Poor awareness of consumers</li> </ul>
Farm level	<ul style="list-style-type: none"> <li>a) Increasing direct or indirect support for livestock sector</li> <li>b) Improvement in quality of milk and yield</li> <li>c) Increasing willingness to livestock investment</li> <li>d) Increase in milk collection centres</li> <li>e) Price differentiation</li> </ul>	<ul style="list-style-type: none"> <li>a) Low productivity and profitability</li> <li>b) Possible EU membership (regarding competition)</li> <li>c) Insufficient activities towards improving genetic capacity</li> </ul>
Processing level	<ul style="list-style-type: none"> <li>a)Unutilised export possibilities,</li> <li>b) R&amp;D Activities</li> <li>c) Possible EU membership (considering the new markets)</li> <li>d) Rise in income in connection to demand increase</li> </ul>	<ul style="list-style-type: none"> <li>a) Imported milk powder</li> <li>b) Taking poor quality raw material</li> <li>b) Fluctuations in economy</li> <li>c)Possible EU membership (regarding competition)</li> </ul>

## **5. PRIORITY OF OBJECTIVES AND POLICY OPTIONS**

The Turkish dairy sector is experiencing serious problems due to low productivity, lack of competition, weak market organization, inefficient legal regulations, high cost, instable prices, low profitability, scattered and fragmented market structure, decreasing effectiveness of support due to its multilayered structure etc. which hamper the development of the sector possessing a growth potential.

One of the fundamental factors that can improve the sector is an increased consumption of animal products in line with an increase in consumer income. However, uneven income distribution is a constraint to consumption increase.

Problems of the milk processing industry such as scale, cost and milk quality weakens the farmers' position in the market, its competitiveness in particular, in addition to effectiveness of marketing system.

All these factors and other findings derived from the study emphasise the importance of prioritising policy objectives and activities that may help to enable further development of sector in order to strengthen its competitive position. In this part, the study presents a hierarchy of policies and policy recommendations based on the interviews done with stakeholders and previous studies.

### **Sufficient and Quality Milk Production**

Before all else, a solution of structural and economic problems is needed in order to provide sufficient quality milk production which is utilised as raw material for the industry. Some of these problems are the multi-scattered structure of holdings, the sector's low level of technology utilisation, equipment in particular, poor physical conditions of barns, or collection system, and production for self-consumption. However, a solution of these farm level problems is very hard and possible only at middle-long term. Main factor for the solution may be measures to increase producer income. Then, producers can perform livestock production under better conditions and at a level which enables them to produce in good quality via the aforementioned solutions for the problems. Accordingly, at the first place, practices such as support measures aiming to

increase farm income of dairy farmers, or increased efforts to apply price differentiation based on quality should be put on the agenda.

Other factors that may be effective in increasing milk quality and quantity may be establishing organised industry areas or raising production via contracting which will be performed by producer organisations, in regions where livestock farming is intensively performed or possesses significant potential. This type of projects or practices may enable improved technical and economic conditions of livestock farming, and dairy farming in particular. Adding to that, extension of processing firms among the country may provide important advantages to East and Southeast Regions where dairy farming was not developed enough.

It is very important that a legal framework for street milk is established in terms of public health and to avoid unregistered production. Marketing strategies and networks can be formatted concerning traditional consumption habits in co-operation with structures similar to producer organisations or institutions such as municipalities.

Productivity increase is the most effective factor in increasing production. Genetic improvement projects including artificial insemination considering seasonal production, embryo transfer, and improvement of domestic breed are significantly important. However, these projects cannot be performed by the producers. Thus, producers union, government, universities and private sector should conduct collective projects.

Increase of consumption and production of sheep and goat milk and their products is very important in terms of raising Turkey's competitiveness during the EU membership regarding livestock sector. Therefore, projects including rural development support that aim to improve sheep and goat dairying in places where dairy cattling cannot be performed or would have any potential.

### **Organisation**

One of Turkish main agricultural problems is the lack or inadequacy of producer organisation. It is not different for milk producers. Many cooperatives or unions such as Damızlık Sığır Yetiştiricileri Merkez Birliği, Köy-Koop ve Hay-Koop operate currently. However, high numbers of unions and cooperatives show that they are not able to operate

effectively. In contrary, it demonstrates the abundance in the sector. For the solution of this problem, at least the unions or cooperatives should have a wide ability of representation.

The processing sector is much better organised than than the farmers are in producer organisations. SETBİR is the most important union of the sector and the shares of the member firms are significant.

An important step towards solving problems of the sector including the organisation issue is the establishment of a “National Milk Council” covering all the stakeholders that can be effective during decision taking process and guiding.

### **A Better Support System**

Animal support system is a highly controversial subject among the milk sector. Below are the recommendations that may increase the efficiency or contribution to production:

1. Supports towards production, not to ownership of land and/or animals
2. Additional premium for contracted production under animal support systems
3. Supporting organisational activities such as collective milking, caring or marketing with an additional premium system
4. Planning the support system at the regional level and in long term considering the demand improvements and productivity which enable sustainability in animal production
5. Generalise investment subsidies on R&D and a laboratory system that backs animal production and food safety
6. Private sector, as well as government, should also contribute in providing technical services, training and equipment, and support producers on the subjects such as technological development.



### **Benefiting advantages of economies of scale**

Many disadvantages, high cost in particular, arise due to the smallness or mediumness of dairy cattle farms. An increase in the scale of holdings which can be followed by the number of animals may lead to an increase in producer's income.

Production quantity and product quantity may be improved in holdings performing milk production commercially as the scale increases. However, one may not forget that increase in scale may lead to problems concerning holding management. Therefore, it is recommended that commercial dairy holdings reach an optimal level which ensures them possessing both a certain income and production level, and avoid them from management and financial problems. Efficient methods to be utilised with this aim may be credits with suitable term and interest rates, and producer organisations.

Another factor that enables the holdings to reach to an optimum level is the change of subsistence or semi-subsistence structure of milk production. A big part of the holdings perform animal farming as an addition to plant production under current circumstances. The holdings which are in regions with a high potential for livestock production should be encouraged to transform into optimum scaled animal holdings. On the other hand, to sustain subsistence and semi-subsistence farming is very important in terms of social policies and food safety.

As emphasised in the study, most of the holdings active in the milk processing sector, mandiras in particular, are small or medium scaled in Turkey. Moreover, big companies provide a considerable part of the production, which demonstrates that size is important regarding the positioning in the sector. Accordingly, practices such as tax, investment subsidy, credit facility, etc. which aim to increase foreign investment on processing sector may be effective in terms of increasing holding size.

### **Improving marketing services**

Marketing of agricultural goods in Turkey is an important problem. Scattered and small structure of farms aggravates the situation. In milk sector, defects in collection and distribution services are the main problems concerning subject of marketing. The large number of the holdings producing milk and lack of equipment (i.e. cooling tank) makes marketing of the milk difficult. Practices such as village oriented investment projects, or establishing a collective milking unit, and cooling tank via producer organisation may

improve marketing services at the level of producers. However, regulations that enable producers unions being more efficient are required. Unless mentioned activities are realised, weak producer position in the market is very difficult to be improved.

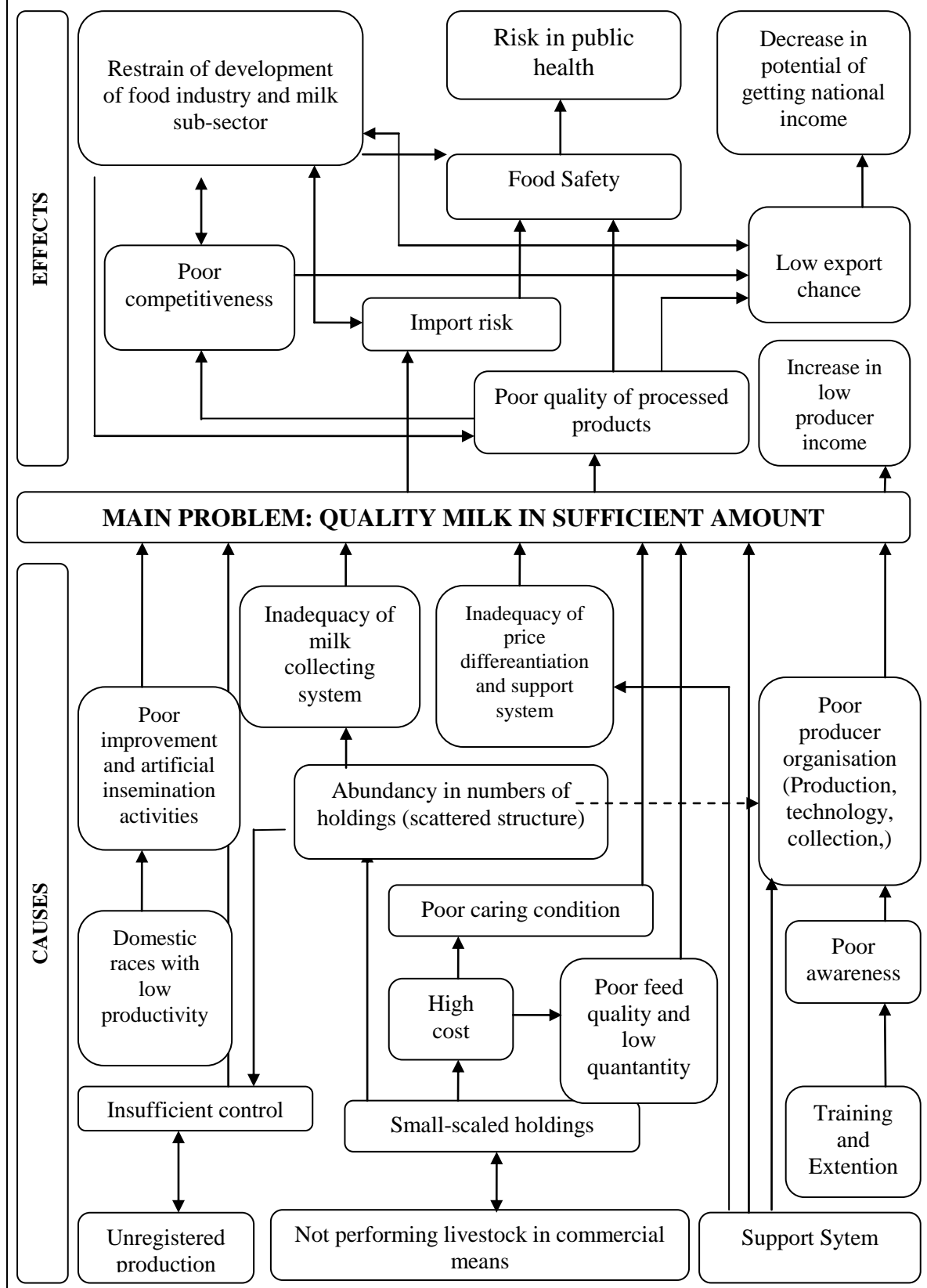
With respect to the processing industry, small and medium scale holdings that are active on regional or domestic markets make it difficult to create a marketing and distribution network. Investment subsidies, marketing support, and establishing national collective distribution network, may improve the marketing services within the processing industry.

One of the preconditions of an efficient marketing system is the formation of information network enabling communication at national and international level. For the improvement of a milk marketing system, a “Milk Registering System” that will enable production planning, guiding, and tracking of the market, and establishing an information network, beside the co-operation of stakeholders in the dairy sector, are vital.

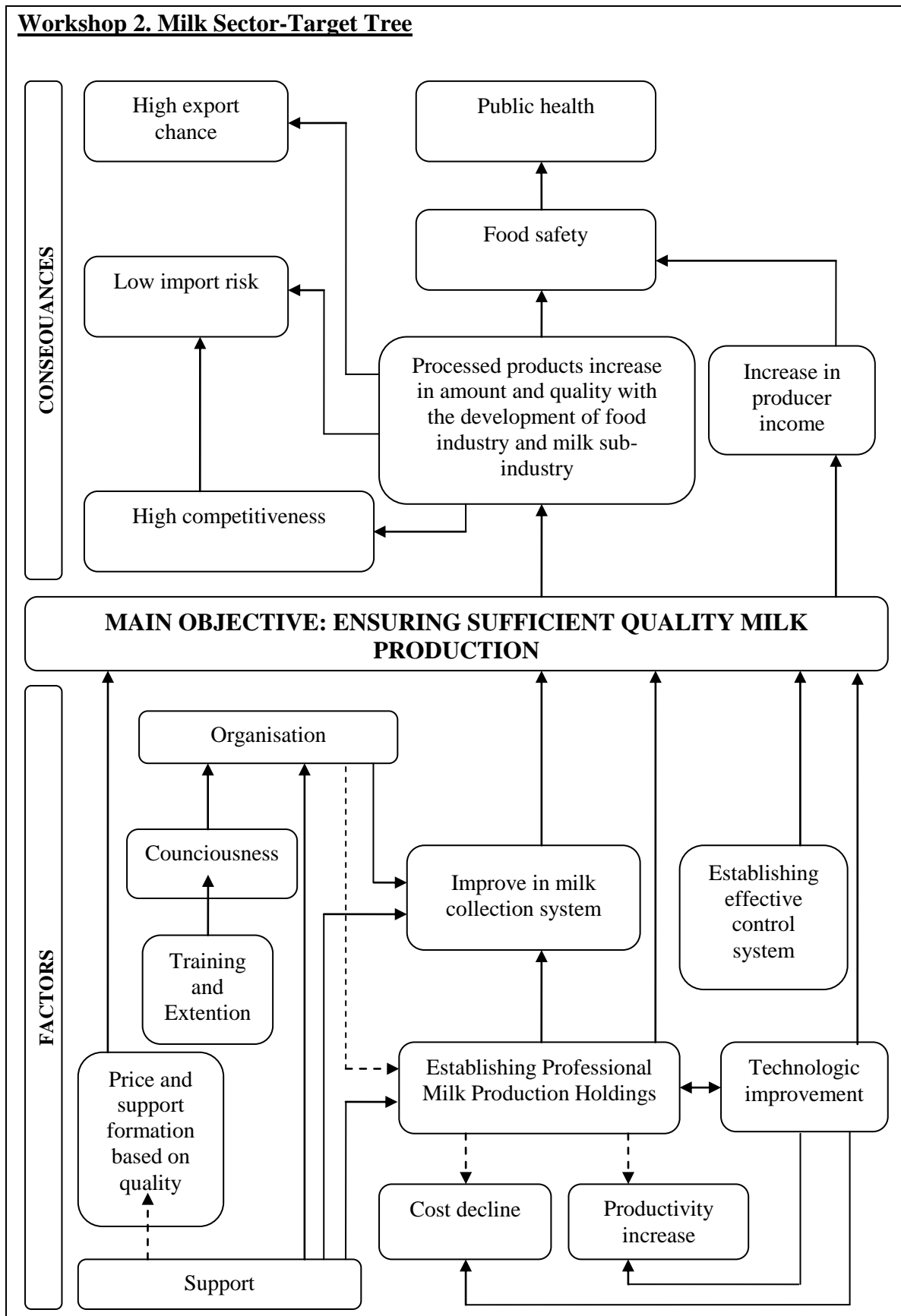
#### **Pricing System – Price Differentiation**

Improvement of a pricing system and differentiation based on quality of the milk can be used as an efficient way both for raising producer income and quality of raw material and products. In order to achieve that, the market price of raw milk and supports should be determined considering certain quality criteria. Within the pricing mechanism, increasing efficiency of producer organisation may strengthen the position of producers in the market.

**Workshop 1. Sufficient Quality Milk Problem Tree**



**Workshop 2. Milk Sector-Target Tree**



**REFERENCES**

- CEEC, 2006. Structure and Competitiveness of the Milk and Dairy Supply Chain in Turkey, Agro Economic Policy Analysis of the new Member States, the Candidate States and the Countries of the Western Balkans Project, D12-3 Third 6 monthly Report, <http://www.euroqualityfiles.net>
- DPT, 2007. 9. Beş Yıllık Kalkınma Planı Gıda Sanayi Özel İhtisas Komisyon Raporu, Yayın No: DPT: 2720 – ÖİK:673, Ankara. <http://www.dpt.gov.tr>
- EU, 2008. EUROSTAT Veritabanı, <http://epp.eurostat.ec.europa.eu>
- FAO, 2006. Overview of the Turkish Dairy Sector Within the Framework of EU-Accession, Draft Report.
- FAO, 2007. AB Giriş Süreci Çerçevesinde Türkiye’de Süt ve Süt Ürünleri Sektörüne Genel Bakış, <http://www.tarim.gov.tr>
- İGEME, 2007. Süt Ürünleri Sektör Raporu, <http://www.igeme.org.tr>
- KKGM, 2008. Türk Gıda Kodeksi, Çiğ Süt ve Isıl İşlem Görmüş İçme Sütleri Tebliği (2000/6 – Resmi Gazete Tarihi, 14.02.2000), <http://www.kkkm.gov.tr>
- OECD, 2007. Agricultural Policies in OECD Countries Monitoring and Evaluation 2007, Paris.
- TEAE, 1999. Tarımsal Ürünler İçin Maliyet Hesaplama Metodolojisi ve Veri Tabanı Rehberi, TEAE Yayın No: 37, Ankara.
- TEAE, 2007. Süt ve Süt Ürünleri Durum ve Tahmin 2007/2008, TEAE Yayın No: 159, Ankara.
- TOBB, 2007. Türkiye Odalar ve Borsalar Birliği Kayıtları.
- TÜGEM, 2008a. Tarımsal Destekler, Tarımsal Üretim ve Geliştirme Genel Müdürlüğü İnternet Sitesi, <http://www.tugem.gov.tr>
- TÜGEM, 2008b. Tarımsal Üretim ve Geliştirme Genel Müdürlüğü Kayıtları.
- TÜİK, Çeşitli Yıllar. Tarımsal Yapı, TÜİK Yayınları, Ankara
- TÜİK, 2004. 2001 Genel Tarım Sayımı Tarımsal İşletmeler, Ankara.
- TÜİK, 2007. Türkiye İstatistik Yıllığı, Ankara
- TÜİK, 2008a. Tarım İstatistikleri Özeti 1987-2006, Ankara
- TÜİK, 2008b. Hayvancılık İstatistikleri, <http://www.tuik.gov.tr>
- TÜİK, 2008c. Üretici ve Tüketici Fiyat İndeksleri Veritabanı, <http://www.tuik.gov.tr>
- TÜSİAD, 2008. Türkiye’de Tarım ve Gıda: Gelişmeler, Politikalar ve Öneriler, <http://www.tusiad.org.tr>
- TZOB, 2008. Türkiye’de Süt Sektörünün Değerlendirilmesi, 2008 Yılı ve Sonrası Beklentiler, Ankara, <http://www.tzob.org.tr>

## Turkish Tomato Sector Analysis

Gülşen KESKİN    Tijen ÖZÜDOĞRU    Cihan NAZLI    Siemen van BERKUM

### 1. INTRODUCTION

#### *Background and approach of the study*

The aim of this study is to describe the state of the tomato subsector and to estimate its performance in Turkey. For this purpose the report evaluates key constraints in the sector's economic development and identifies some governmental policy priorities that may help to enhance the Turkish tomato subsector's future perspectiveness.

This sector report covers the following issues:

- a description of the sub-sector based on secondary data including among others trends in production, consumption and trade, yields, prices, concentration of production, capacity utilization and a description of marketing channels within the supply chain,
- primary data collection using case-studies to illustrate bottlenecks or opportunities to the sector's development and to identify key activities in the tomato sector
- identification of key constraints limiting the competitiveness and development of the sector.

The content of this chapter is as follows. After this brief introduction, the sector's general situation is evaluated in section 2. In section 3 and section 4 the production value and marketing channels are introduced and analysed. Sector features and a number of indicators of competitiveness are presented and analysed in section 5 and 6. Based on these analyses, a SWOT, which includes the sector's strengths and weaknesses as well as opportunities and threats, is drafted in section 7. Finally, suggestions for a few key policy interventions are given in the last chapter.

### 2. OVERVIEW OF THE TOMATO SECTOR

3% of world's total vegetable output is produced in Turkey. The country is one of the most important vegetable growing countries where many kinds of vegetables are grown

due to the country's most suitable ecological conditions. According to 2007 data, Turkey produced 25.6 million ton of vegetables, while the country is a world top-3 producer of watermelons, cucumbers and tomatoes. 3 % of the cultivated area in Turkey is used for vegetables production. Main outlet is the domestic market; only 2% of the vegetable production is exported (Keskin and Çakaryıldırım 2005; www.fao.org).

Next to open field production, vegetable production in Turkey takes place under glass and/or plastic. Vegetables account for 96% of the total cultivation under glass/plastic; fruits and ornamental plants propagation constitutes the rest (TZOB, 2007). Among the main vegetables produced in greenhouses are tomato, cucumber, pepper, melon, watermelon and pumpkin. Tomato is produced in half of all greenhouses. Protected cultivation is a profitable activity as it is concentrated in a period in which vegetables are not grown in open field. Greenhouse production of vegetables is concentrated in the Mediterranean Region.

Total vegetable production varies from year to year in Turkey. However, on average tomato constitutes 36-40% of the country's total vegetable production and 50% of total vegetable exports. The tomato is the most processed vegetable in Turkey and is used as fresh, preserved and processed in all sub-branches of the food sector such as the vegetable and fruit canned food industry, fruit juice industry, frozen vegetable and fruit industry, dried fruit and vegetable industry (Keskin ve Gül, 2004). Yet, tomato processing companies mostly display export activities because Turkish people prefer home-made instead of processed products (Keskin ve Çakaryıldırım 2003).

Tomato production in Turkey has several advantages thanks to very suitable ecological conditions, a strong domestic consumption of fresh vegetables and a young rapidly growing population. But the country has some important problems too, such as structural matters faced in production, inadequate organization, little compliance of the cultivation methods to the rules of good agriculture practices (GAP)<sup>4</sup>, the complexity of marketing channels for vegetable and high post-harvest production losses. All these aspects result into low incomes of producers and low foreign trade shares.

---

<sup>4</sup> Problems faced with respect to food safety became more important around the world in recent years. Therefore it has been compulsory to produce a product according to quality and food standards desired and to ensure accountability. Turkey has adopted some legal arrangements showing the required susceptibility on GAP and food safety in the light of both EU alignment and international developments.

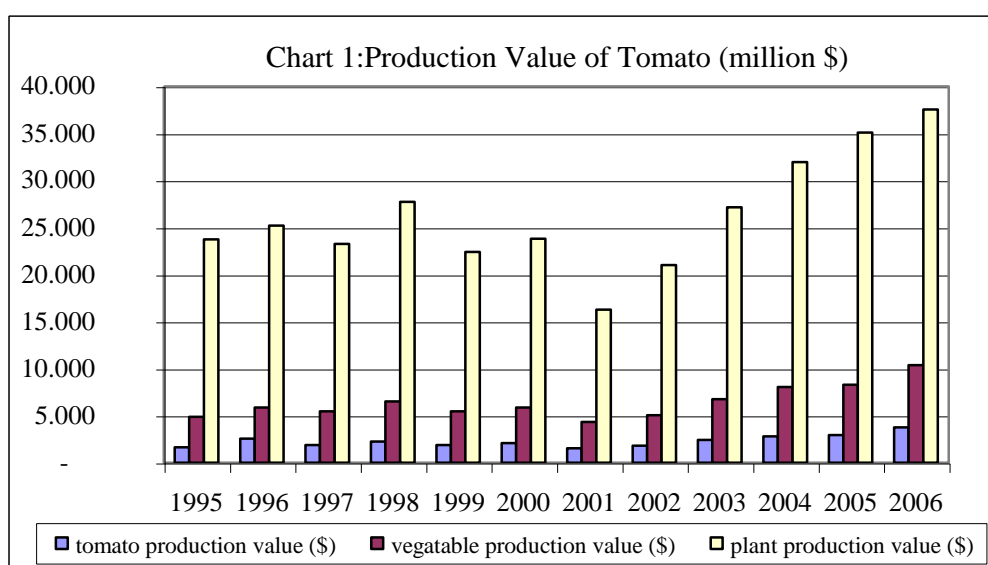
### 3. PRODUCTION VALUE

As presented in Table 1, the 2006 production value of tomato was 3.7 billion US Dollar, more than twice the value in 1995. Tomato production accounts for 36% of the 2006 total vegetable production value. This share has been rather constant since 2000. Vegetable production varies year to year and its share in the total crop production value fluctuates between 6.8 - 9.9 %.

Table 1: Production Value of Tomato and its Share in Vegetable Production (million \$;%)

Production Value	1995	2000	2001	2002	2003	2004	2005	2006
Tomato (1)	1.624	2.088	1.528	1.811	2.413	2.787	2.949	3.736
Vegetable (2)	4.874	5.863	4.343	5.060	6.769	8.036	8.284	10.368
<b>(1/2)%</b>	<b>33,3</b>	<b>35,6</b>	<b>35,2</b>	<b>35,8</b>	<b>35,6</b>	<b>34,7</b>	<b>35,6</b>	<b>36,0</b>
Crop Production (3)	23.722	23.807	16.257	20.995	27.132	31.962	35.082	37.545
<b>(1/3)%</b>	<b>6,8</b>	<b>8,8</b>	<b>9,4</b>	<b>8,6</b>	<b>8,9</b>	<b>8,7</b>	<b>8,4</b>	<b>9,9</b>

Source: TURKSTAT



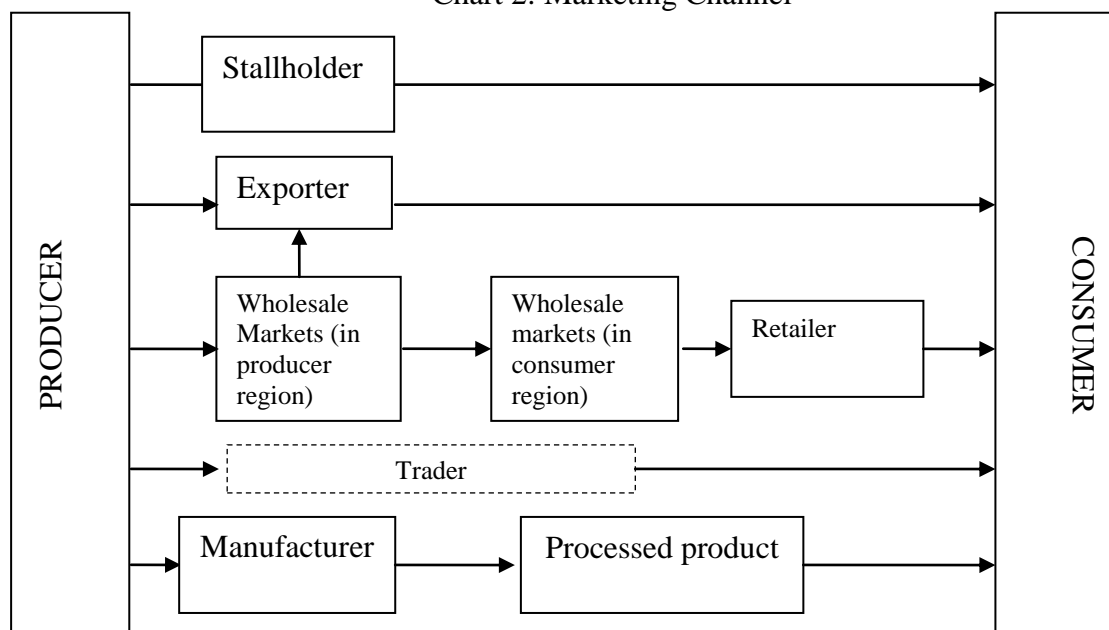
### 4. MARKETING CHANNELS

Wholesalers have an important role in the marketing of fresh vegetables and fruits. Processed amounts in industry vary from year to year and have been around 2 million ton (15-20% of total production) recently. Export, though, is rather low: only a quarter million ton. Taking into account the rather big losses occurring between the stage of



production and the consumer (approximately 20-40% of production does not reach the consumer), an estimated 4-6 million ton fresh tomato has been available at the domestic market in the last 10 years. Sales in domestic market are mostly performed by wholesalers and persons called trader-wholesaler. The domestic trade in vegetables is characterised by the (long) length of the marketing channel, the highly perishable nature of vegetables, being a product ready to eat, and the inefficiency of producer unions to act as a marketing organization.

Chart 2: Marketing Channel



Big supermarkets have entered the marketing channel for fresh vegetables and fruits in recent years. They generally work together with a broker in wholesale markets and products are purchased directly without entering the market physically. The share of supermarket chains in fresh vegetable and fruit marketing is not known but is increasing and may be considered substantial.

Producer unions play an important role in the marketing system of fruit and vegetables in EU. The share of these unions varies per county, yet an estimated 50% of the total production is sold through 1400 producer unions. (TKB, 2006a). Agricultural cooperatives as well as producer unions have gained importance in recent years in Turkey. Legal arrangements about producer unions exist in Turkey, yet the opportunities

from these arrangements to improve the farmers' market positions have not (yet) been implemented efficiently.

The establishment and development of (non profit-driven) agricultural producer unions to serve producers from production to marketing are included in the government's agricultural strategy plan. The plan argues that as most agricultural holdings have small sizes, producers have problems taking up new technologies and integrating with markets and industry. Producer unions could be instrumental to improve the farmers' position (SPO, 2008).

Producers display fragmented and weak structure against other actors involved in the marketing channel because small family holdings dominate in Turkey. Cooperatives have not developed sufficiently into economical organizations. That situation can be seen at all stages from production to marketing. Consequently, it is very hard to assess the effect of the establishment of producer organisations on the position of the producers in the marketing stage of the supply chain.

Tüzel et al.(2005) estimates that 85% of the vegetables produced in greenhouses are sold in wholesale markets and only 3% in local markets. The rest 12% is being sold directly to consumers by farmers from their holdings.

**Box 1: Turkish Fresh Vegetable- Fruit and Agents Federation (TÜSEMKOM)**

Tüsemkom was founded by vegetable and fruit agents operating at wholesale markets in 2002. The information obtained from interviews by TÜSEMKOM is summarized below.

Wholesale markets work like a stock exchange for the fresh vegetable and fruit chain. Producer unions, wholesalers and traders have operations in wholesale markets. Wholesale traders appear to work most efficient because producers have limited possibilities for trading (little time, poor knowledge, etc.) and trading by producer unions is weakly organised. The marketing of fresh vegetable and fruit to consumption places and buyer groups are mostly executed by wholesalers.

Wholesalers receive 8% commission for their marketing service according to the Markets Law regulating the marketing of fresh vegetable and fruit. The share of total production entered into markets in the last three years was 25 % according to TUSEMKOM. It is stated that 90% of the products offered at markets are traded by wholesalers.

It is stated that 50% of products marketed by wholesalers are sold in market places. The share of wholesalers in the retail sector is around 25%. The remaining part is directed to export and industry for processing. Many wholesalers are producers as well and sell their goods and products at places rented in the market. Great part of wholesalers sell products in agreement with producers.

It is expected that EU membership will provide a huge stimulus to producers' efforts to comply with quality standards and traceability requirements, and invest in the organization of producers and the infrastructure of producer unions.

**Box 2: Some important recent changes in the fresh fruit and vegetable market in Turkey (Koc, 2006)**

- Since the end of the 1990s many wholesalers operating in big provinces entered production regions such as Antalya, Mersin, etc.
- Many wholesalers started to organize offering credits, consultancy, transport services, etc. to producers.
- Many wholesalers have entered into production.
- Wholesalers became more interested in quality and sanitary standards
- The demand of importing countries for product quality and sanitary standards also affects the quality offered at the domestic market.
- Changes in trade between regions occurred: for instance traders from the Mersin Province (Mediterranean region) send products to Ankara, while those from the Aegean and the Marmara region started shipments to Eastern and Southeastern provinces.
- Supermarket chains establish their supply chain and work together with one or a few (specialized) wholesalers.
- Supermarkets set up relations with big producers and cooperatives directly (for example Metro)
- The number of wholesale markets increased rapidly especially in regions, towns and districts producing vegetables and fruits
- Producers increasingly complain about the margin between producer and retail prices.
- Big firms are increasingly involved in wholesale trading (Metro, Gros Market, Unifruits)
- The marketing chain becomes more complex.

## **5. SECTOR ANALYSIS**

### **5.1. The Structure of the Tomato Processing Industry**

The tomato processing industry is concentrated in the Marmara and Aegean Region. The industry is located in or close to the major tomato production areas.. 15-20 % of the tomatoes grown are processed by the industry. 80-90% of the processed tomato is used in tomato sauce industry annually. Tomato sauce as well as other products of canned industry is produced by some 100 holdings and facilities.

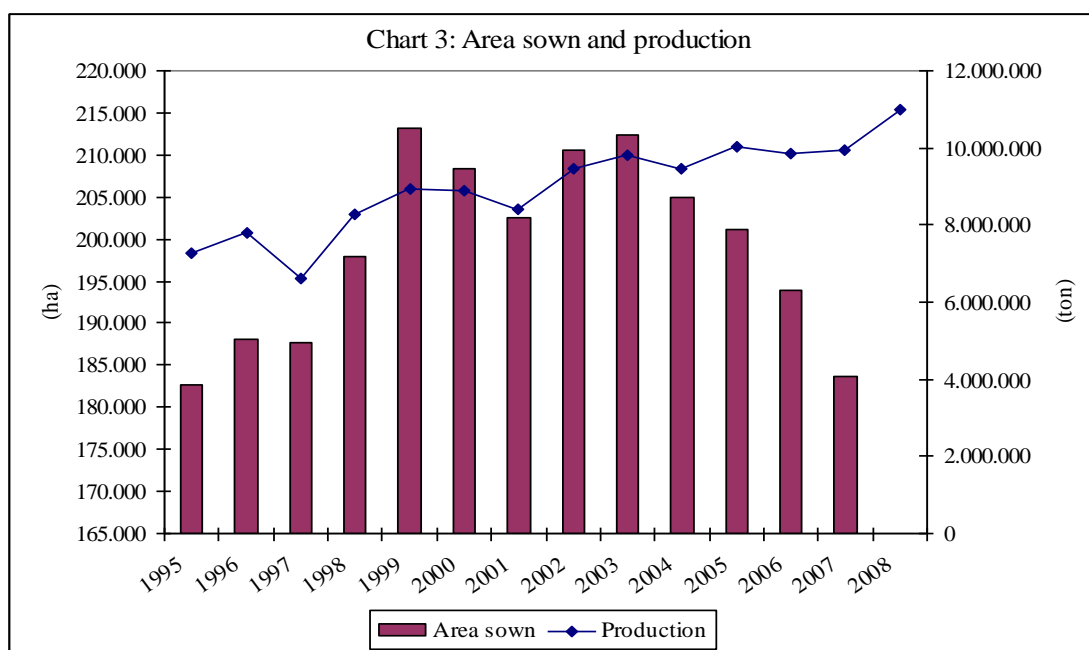
Tomato are processed by factories and facilities established by the private sector. Employee numbers and production amounts of manufacturing industry are registered statistically for companies providing employment of 10 persons or more. These firms

realize the greater part of Turkey's total tomato sauce production: in 2005 the biggest 13 firms accounted for 67%. Industry plants consist of modern facilities at the level of developed countries, yet there are also firms processing tomato sauce at workshop level.

Around 50% of tomato sauce and 90-95 % of dried tomato is exported. The production of dried tomato has exceeded 100.000 ton due to increasing demand for this high value added product abroad.

## 5.2. Production, Consumption and Trade

Figures on production, consumption and trade of tomato are presented in Table 2. Over the period 1995-2007 production increased by 2.7 million ton to almost 10 million ton in 2007. Exports increased by 300,000 ton to reach 400,000 ton in 2007. Import is insignificant over the whole period. Production losses are estimated at 15% which is rather high compared to other countries.

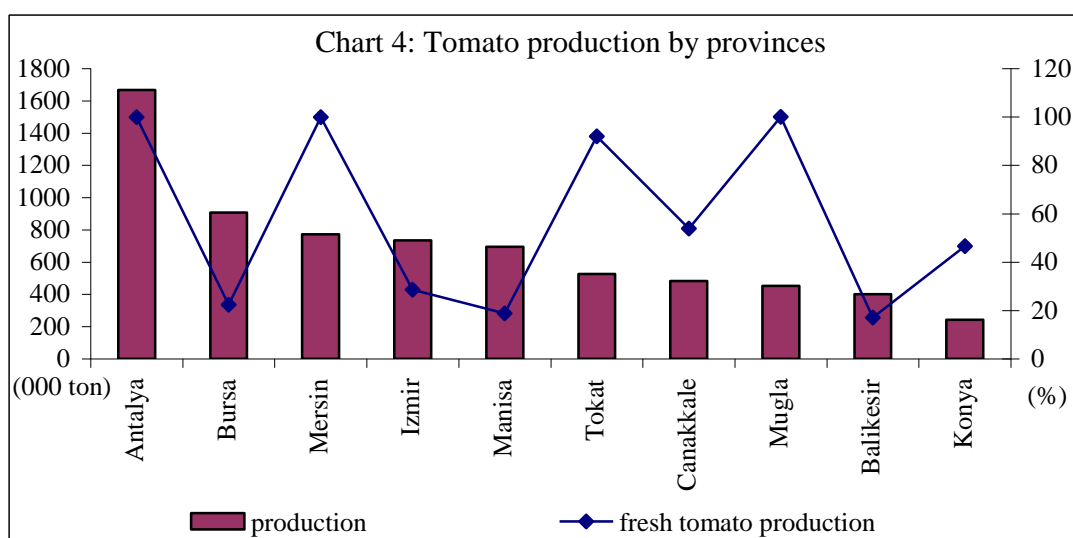


Source: TUIK

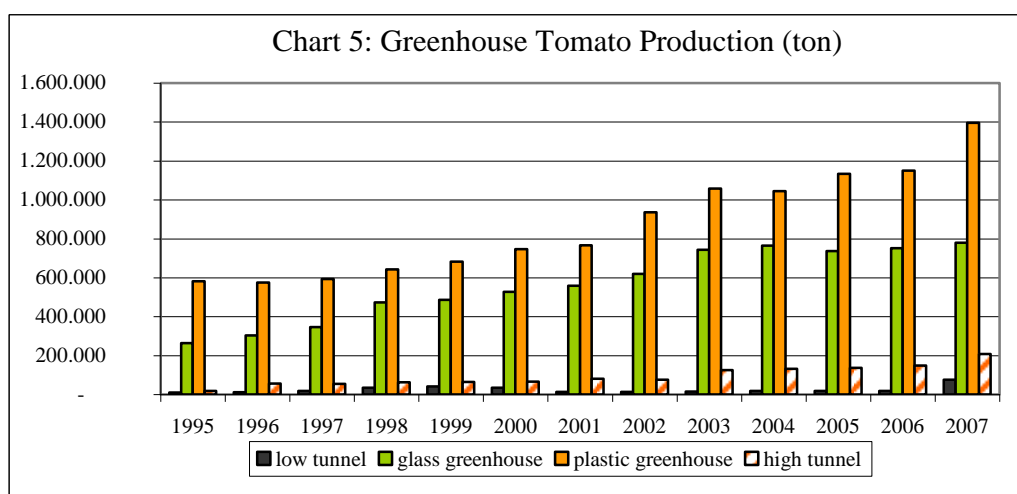
### 5.2.1 Production

Chart 3 shows the fluctuations in the area cultivated with tomatoes and the production levels in the years 1995-2007. The area shows an increase in the second half of the 1990s

but has declined again since 2004 to reach a similar number of hectares in 2007 as in 1995. The increase in productivity and the production area under glass and plastic has been responsible for the increase in Turkey’s tomato production. Production under protected circumstances (either in a plastic tunnel or a glasshouse) was 874,000 ton in 1995 and reached 2.5 million ton in 2007, a 181% increase. The increase in open field production in the years above mentioned was only 17%. The increase of the production per hectare in open field and protected cultivation has been 23% and 17% respectively. Out of 9.9 million ton production in 2007, 30% has been sold as industry tomato.



Greenhouse tomato production was implemented at 9,000 ha in 1995. This area increased 117% and reached 19,900 ha. in 2007. The plastic greenhouse is the most important greenhouse system: 57% of the 2007 tomato production from protected cultivation in Turkey is from plastic greenhouses, 32% is from glass greenhouses, 8% from high tunnels and 3% from low tunnels.



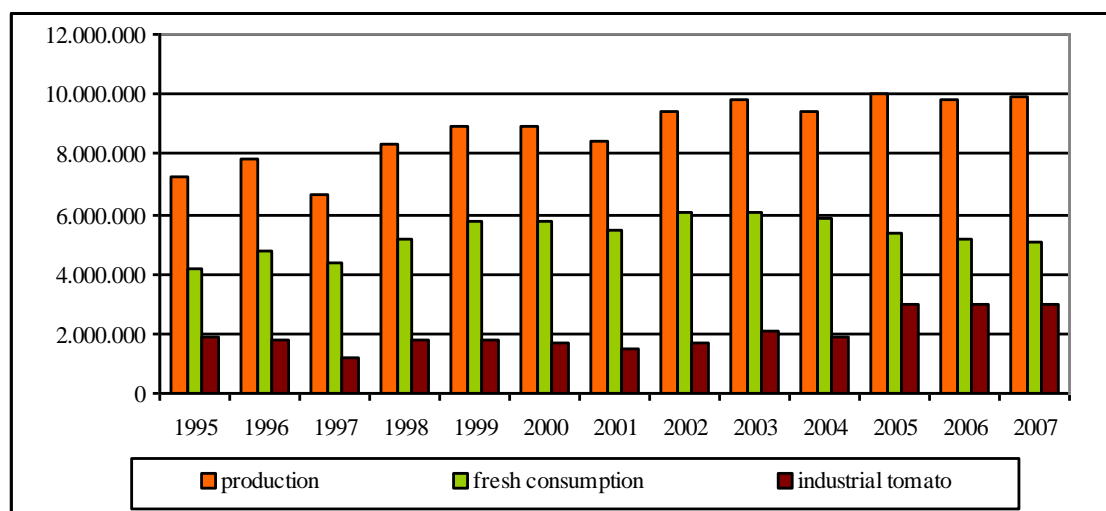
Source: TUIK

Table 2: Supply and Demand of Tomato

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cultivation area (ha)	182.699	188.082	187.625	197.888	213.255	208.410	202.468	210.630	212.285	204.889	201.116	193.909	183.703
Yields (kg/ha)	39,7	41,5	35,2	41,9	42,0	42,7	41,6	44,9	46,3	46,1	50,0	50,8	54,1
Production (ton)	7.250.000	7.800.000	6.600.000	8.290.000	8.956.000	8.890.000	8.425.000	9.450.000	9.820.000	9.440.000	10.050.000	9.854.877	9.945.043
Industry tomato (ton)	1.920.000	1.775.000	1.145.000	1.790.000	1.750.000	1.700.000	1.500.000	1.700.000	2.050.000	1.889.754	2.983.000	2.942.132	2.973.393
Loss (15%)	1.087.500	1.170.000	990.000	1.243.500	1.343.400	1.333.500	1.263.750	1.417.500	1.473.000	1.416.000	1.507.500	1.478.232	1.491.756
Net fresh production (ton)	4.242.500	4.855.000	4.465.000	5.256.500	5.862.600	5.856.500	5.661.250	6.332.500	6.297.000	6.134.246	5.559.500	5.434.513	5.479.894
Import (ton)	0	93	30	82	67	-	55	74	11	40	40	-	-
Fresh consumption (ton)	4.143.973	4.735.956	4.324.190	5.112.688	5.762.648	5.736.601	5.470.537	6.079.085	6.068.234	5.898.922	5.309.358	5.130.316	5.085.659
Export (ton)	98.527	119.137	140.840	143.894	100.019	119.899	190.768	253.489	228.777	235.364	250.182	304.197	394.235

Source: TURKSTAT, FAO, AEU, USDA and SPO

Chart 6: Production and Consumption of Tomato (ton)



Source: tuik.gov.tr

**Box 3: Some features of tomato production***Production structure*

Tomato production takes place in open field and in protected production systems (greenhouses/tunnels). Production for fresh consumption is mainly sold on spot markets (without contracts between farmers and traders) while tomato production for processing is largely based on contracts.

*Organic production*

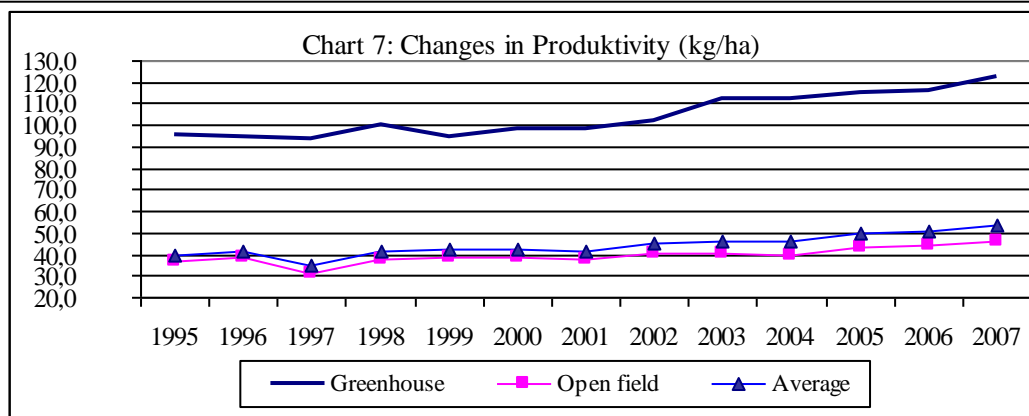
10.553 farmers are engaged in organic fruit and vegetable production, which was 430,000 ton according to 2007 data. Only 5% of this volume (around 20,000 ton) is organic tomato (tugem.gov.tr). The share of organic production in total tomato production is quite low, only 0.2%. The number of holdings growing organic tomato is about 9% of total holdings producing organically. İzmir, Bursa, Balıkesir, Aydın and Manisa (all in the Aegean region) are important provinces producing organic tomato. ([www.tugem.gov.tr](http://www.tugem.gov.tr)). Organic vegetable and fruit production in Turkey is mainly directed to export. Great portion of export is made to EU and USA.

*Protected production*

Production under glass/plastic is concentrated especially in the Antalya and Mersin province in the Mediterranean region. Protected cultivation takes place in the period of the year when cultivation in the open field is impossible due to natural circumstances. 4 different protected production systems are used in Turkey. These are:

- Plastic greenhouse
- Glass greenhouse
- Low tunnel
- High tunnel

Production in plastic greenhouses is increasing as this type is cheaper than production under glass, more modern than tunnels and easy to operate. Plastic greenhouses established recently are the Israeli type of greenhouses. As hydroponic cultivation is also possible in plastic greenhouses, the increased use of that technique has contributed to the increase of production in plastic greenhouses.



Source: TURKSTAT



**Box 4: Interviews with farmers producing tomato under glass/plastic in Antalya***Production*

Tomato production under glass or plastic is made in a single or dual cultivation system. In a single product system, the same product is cultivated in the greenhouse during the growing season, while in a dual product system, two products are grown in the greenhouse between August/September and January. The growing season can, however, continue till June/July.

The average cultivation area in glass and plastic greenhouses is generally between 1-6 dekar and productivity per ha varies between 140-200 ton tomatoes. Coal and wood is used for heating. Chinese coal is used in recent years, although it depresses productivity. Farmers interviewed indicated to face problems in marketing and export because of oversupply.

*Marketing*

Producers bring their products to market and local markets where wholesalers sell products on behalf of them. Wholesalers classify products based on their quality feature. First quality products are sold to exporters, while the second quality products are presented to the domestic market. Some farmers expressed that they request directing their products to export directly but as they are not willing to take high risks, they sell their produce to wholesalers. In addition, farmers claim that products can not be exported directly as producer unions are not efficient in their marketing activities. Some farmers said they sell their products compulsory to wholesalers because some inputs such as fertilizers and pesticides are provided by them.

*Producer unions*

Producers consider producer unions to operate inefficiently and being unable to get the best price for the farmers. Although they would like to sell their products via producer unions they do not approach them positively due to a lack of confidence in their operations. Main reasons mentioned by the farmers for this are the unions' inadequate infrastructure and the incapable management.

*Expectations from EU membership*

Farmers producing tomato under glass/plastic think that membership of the EU will increase their sale/export and product prices and therefore will have positive effects for them. They envisage increased production under glass/plastic as well as positive effects on product quality.

*Consultancy Services*

Producers said they take consultancy services from pesticide distributors but acknowledge that it would be better to take such service by a professional consultancy with more adequate technical knowledge.

The demand and supply balance for Turkish tomato sauce is presented in Table 3. Imports are negligible. The production season of tomato sauce starts in September and finishes at the end of August the following year. Around 45-55% of the production was exported between 2000-2007.

As tomato contains mostly water and it is not an easy product to store it should be processed instantly after harvest. Therefore the industry's capacity usage during the campaign period is around 50%.

Table 3. Supply and Demand of Tomato Sauce in Turkey (ton)

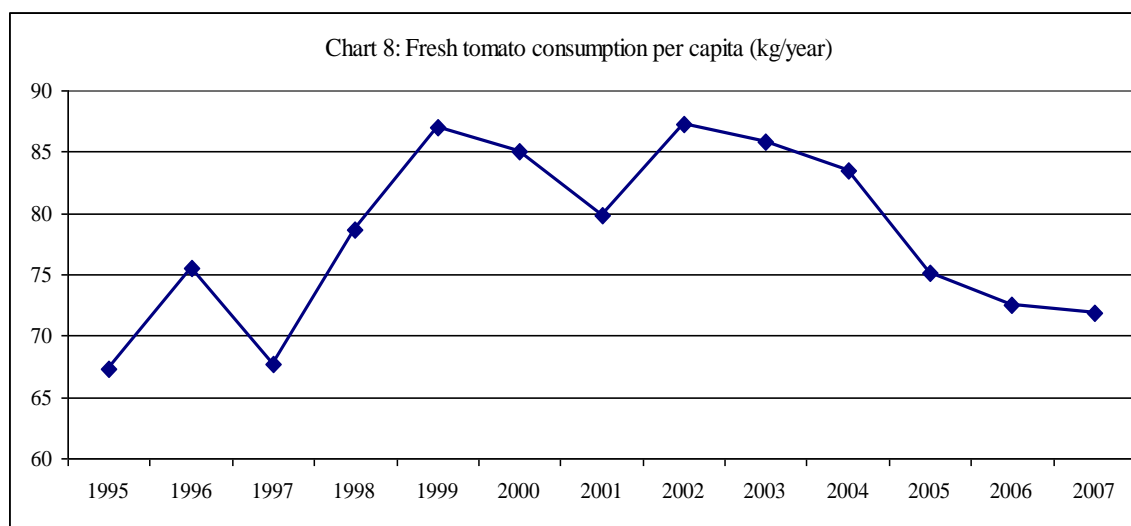
	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
Industry Tomato	1.700.000	1.500.000	1.700.000	2.050.000	1.889.754	2.983.000
Processed for t. sauce	1.560.000	1.440.000	1.590.000	1.920.000	1.620.000	1.590.000
Production	260.000	240.000	265.000	320.000	270.000	265.000*
Import	2.040	721	242	569	695	308
Beginning stock		3.121	5.290	4.369	40.810	25.000
Export	129.054	113.454	143.347	177.028	167.691	165.000
Domestic use	108.000	125.098	122.816	107.100	118.814	121.552
Finish stock	3.121	5.290	4.369	40.810	25.000	3.756

Source: TURKSTAT, FAO, AEU, USDA and SPO

\*www.gidasanayii.com

### 5.2.2 Consumption

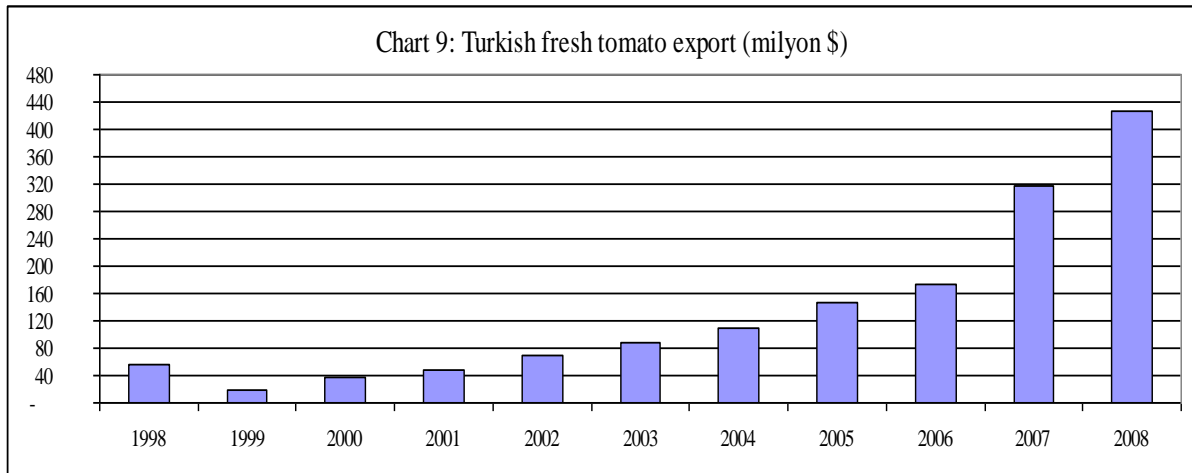
Although tomato consumption per capita varies from year to year it has decreased after 2002 (see Chart 8). While fresh tomato consumption was 67 kg/capita in 1995, it increased to 80-90 kg/capita in the years before and after 2000, yet declined in recent years to reached 72 kg/capita in 2007. Consumption also decreased due to a decline in production in 1997, 2001 and 2004. The decrease in recent years is assumed to be the result of an increase in the share of tomato production used for processing into tomato sauce.



Source: TEAE

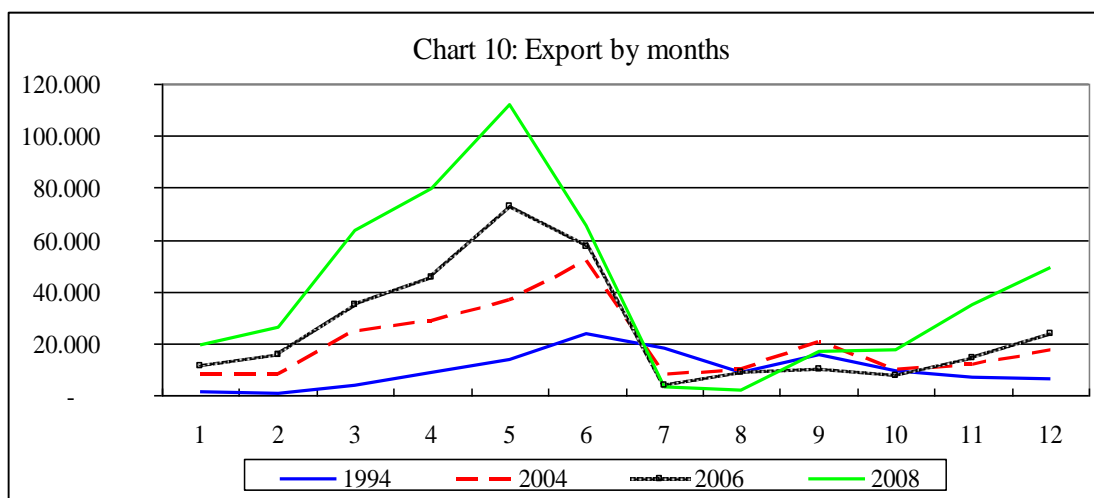
**5.2.3 Export**

Fresh tomato export values for 1998-2008 are presented in Chart 9. Turkey is the fourth biggest exporting country in the world, after Spain, Mexico and Netherland, accounting for approximately 400.000 ton in 2008. The country’s tomato export value was 57 million USD in 1998. This value increased regularly from 1999 onwards. Export value has reached its highest level to 320 million USD in 2008. Import is insignificant and less than 100 ton.



Source: TEAE, www.akib.gov.tr

Tomato export of Turkey has realized over 200.000 ton since 2002. Tomato sauce export has become the equivalent of the fresh tomato export every year but it decreased importantly in 2001 compared to former year and it reached the equivalent of 1 million ton fresh tomato after 2002.<sup>5</sup>



Source: tuik, www.akib.gov.tr

<sup>5</sup> In terms of equivalent of tomato, 1 kg tomato sauce is equal to 6 kg tomato; 1 kg tomato sauce is equal to 4 kg Catsup and 1 kg dried tomato is equal to 14 kg tomato.

**Box 5: Good Agriculture Practices and Standards**

*Food control services in Turkey* are carried out by General Directorate of Protection and Control (KKGM) within Ministry of Agriculture and Rural Affairs. Some duties of KKGM within the scope of these services are:

To coordinate audits and controls for all stages of the food production chain according to the Law No: 5179, to provide safety food supply by establishing an efficient control system within the context of EU alignment and for this purpose to implement the concepts of Hazard Analysis and Critic Control Points (HACCP) and Good Hygiene Applications at all stages of the food production chain, to provide traceability of food and effect auditing by establishing a control system based on risk assessment; to follow and evaluate results coming from provinces by preparing annual auditing program; to arrange Food Safety/Health Certificate after making necessary examinations, to assign, direct and coordinate affiliated provincial organizations to take necessary measures for export products rejected, to plan, coordinate studies on additives, pesticide traces and contaminants and assign provincial organizations to carry out these studies, to take required measures providing technical and scientific support at emergency states relating to food safety and to provide implementation of these measures by provincial organizations without any delay; to prepare and implement projects on nutrition, to assist and follow the preparation of development plans and implementation plans. (kkgm.gov.tr).

*The regulation on Good Agriculture Practices*

This regulation was put into effect after publishing the Official Gazete No: 25577 of 08.09.2004. The regulation has been prepared to prevent agricultural production from harming the environment, human and animal health, to protect natural resources and provide traceability and food safety for agricultural products. Every kind of control and certification implemented for fresh vegetable and fruit production activity will be made by institutions authorized by the Ministry of Agriculture and Rural Affairs. ([www.tarim.gov.tr](http://www.tarim.gov.tr)).

*Standards*

The tomato standard presented to market fresh tomatoes is the TOMATO TS-794 standard of TSE (Turkish Standards Institute). The definition of that standard tomato depends on the classification and characteristics, sampling, examinations and supply to market. According to the Decree Law on “Arrangement of Fresh Vegetable and Fruit Trade and Wholesale Markets” standards regarding goods subject to wholesale trade and treated in wholesale markets may be put into effect necessarily within the context of related legislation by taking the view of the Ministry of Industry. Additionally the Tomato TS-794 standard is a mandatory standard implemented in export according to the declaration on Standardization at Foreign Trade No:2004/28.

Standards related to tomato sauce are the TS 1466 Tomato Sauce Standard of TSE for domestic production and the TS 11600 standard relating to the General Assembly of Tomato Sauce Factories.

Tomato exports of Turkey is highly seasonal and generally takes place between February and June (see Chart 10). Over the year export reaches the lowest level in July when production in open field is bottoms out. Exports are low between July and November and show an increasing tendency in the months onwards to reach the highest level between May-June.

Next to demand, trade is directed by applying rules on quality and food safety standards. 11 private organizations have been authorized to control and certify products according to the arrangements regarding good agriculture practices which importance is continuously increasing. Certification related to GAP has started by EUREGAP and the number of producers having EUREPGAP certification reached 3,222 in 2006. As the majority of small holdings and producers does not show enough awareness of GAP requirements there are important duties to be done by public institutions and main retail organizations. ([www.tarim.gov.tr](http://www.tarim.gov.tr)).

Main regulations in Turkey are the decree law on Arrangement of Fresh Vegetable and Fruit Trade and Wholesale Markets and the law No: 5652 making modifications to that decree. TSE (Turkish Standards Institute), KKGM (General Directorate of Protection and Control) and Undersecretariat of Foreign Trade are related institutions for standards and their implementations.

**Box 6: Provincial Control Laboratories accredited by TÜRKAK (Turkish Accreditation Authority),**

- Ankara Provincial Control Laboratory,
- İzmir Provincial Control Laboratory,
- İstanbul Provincial Control Laboratory,
- Mersin Provincial Control Laboratory,
- Samsun Provincial Control Laboratory,
- Ordu Provincial Control Laboratory,
- Antalya Provincial Control Laboratory,
- Giresun Provincial Control Laboratory,
- Konya Provincial Control Laboratory,
- Gaziantep Provincial Control Laboratory,
- Trabzon Provincial Control Laboratory,
- Tekirdağ Provincial Control Laboratory,
- Kocaeli Provincial Control Laboratory,
- Adana Provincial Control Laboratory,
- Bursa Central Food Control and Research Institute.

Out of these provincial laboratories, accreditation transactions of Bolu, Kayseri, Hatay and Denizli provincial laboratories continue.

Besides, 37 private food control laboratories taking permit from Ministry of Agriculture and Rural Affairs display activity.

Audits at every stage of the food chain are executed based on the annual audit and monitoring program prepared by the Ministry on the basis of product and its risk in addition to routine food audit programs performed at provincial level by 81 Provincial directorates according to the law on adoption by changing the decree law on Production, Consumption and Control of Foods No: 5179

For this purpose, the Audit and Monitoring Program on the basis of risk for 27 different products was implemented in 2007. 15,921 samples were analyzed for pea, pepper, wheat, strawberry, tomato, bread, apple, plum, grapefruit, carrot, cucumber, pumpkin, cauliflower, onion, fresh bean, melon, apricot, cherry, lemon, mandarin, lettuce, banana, potato, aubergine, rice, orange, orange juice and grape. A negative result was taken for 1.7% on Pesticide Residues.

Controls made for fresh vegetable and fruit among food controls increased from 0.006% to 3.8 % between 2002-2007. The control number for fresh vegetable and fruit being 254 in 2002 became 3489 in 2007. Control rates for processed vegetable and fruit increased

## **6. COMPETITIVE ANALYSIS**

### **6.1 Cultivation Area and Average Holding Size**

The 2007 cultivation area under tomatoes in Turkey is around 184,000 ha.. In Italy and Spain, being important producer countries in the EU, the area is 118,000 ha. and 56,000 ha. respectively ([www.lfl.bayern.de](http://www.lfl.bayern.de)). The cultivation area of Turkey is equal to 64% of the total cultivation area under tomatoes of the 7 most important tomato producing EU countries. The average size of an agricultural holding in Turkey is 6 ha., according to the 2001 agricultural census. Holdings growing tomatoes have an average land area of 0.72 ha. Tomato is grown at around 9 % (282,690) of 3 million agriculture holdings.

There are 556,700 holdings growing vegetable, melon/water melon and berries in EU-15, according to a 2003 agricultural structure questionnaire. These holdings produce on around 1.3 million ha.. The average size of the holdings is around 2.4 ha. Most of these holdings can be found in Italy (31%), Spain (30%) and Greece (11%). Main vegetable producers in the EU are Italy, Spain, and France.

All tomato production in the Netherlands is cultivated under glass. The Netherlands is one of the major tomato producing countries in the EU. Although the number of tomato producing holdings fell to 489 from 937 in 1995, production increases were realized over the same period (Productschap Tuinbouw, 2006).

### **6.2 Average Yield of Tomato Production**

With a share of 28% tomato holds the first place among all vegetables produced in the EU. Approximately 60% of harvested tomato is used for processing purposes (lfl, 2006), while in Turkey this share is about one third. Italy is the most important tomato producing country in EU, producing 6-7 million ton in recent years (against 10 million in Turkey). Annual consumption per capita in Italy is around 66 kg. Average consumption per capita for EU is around 29 kg (TKB, 2006), compared to 72 kg/capita in Turkey.

Table 4: Production and Productivity of Tomato in EU and Turkey

Countries	Production (1000 ton)				Yield (ton/ha)				Loss (%)
	2004	2005	2006	2007	2004	2005	2006	2007	2003
EU25	17.332	17.665	15.524	15.075	55,8	60,1	59,8	61,2	-
<b>EU27</b>	<b>18.900</b>	<b>18.418</b>	<b>16.572</b>	<b>15.764</b>	<b>49,5</b>	<b>53,3</b>	<b>52,4</b>	<b>52,4</b>	-
<i>Spain</i>	4.383	4.810	3.679	3.615	62,7	66,5	64,2	65,0	9,1
<i>Italy</i>	7.683	7.187	6.351	6.025	52,9	51,8	51,9	50,9	3,8
<i>Portugal</i>	1.201	1.085	983	1.000	85,6	79,3	75,5	80,0	10,3
<i>Greece</i>	2.030	1.707	1.568	1.450	51,8	47,9	46,7	54,7	10,1
<b>Turkey</b>	<b>9.440</b>	<b>10.050</b>	<b>9.855</b>	<b>9.945</b>	<b>46,1</b>	<b>49,9</b>	<b>50,8</b>	<b>54,1</b>	<b>15,0</b>
<b>Turkey (%)</b>	<b>49,9</b>	<b>54,6</b>	<b>59,5</b>	<b>63,1</b>	<b>93,1</b>	<b>93,6</b>	<b>96,9</b>	<b>103,2</b>	-

Source:tuik.gov.tr, fao.org.tr

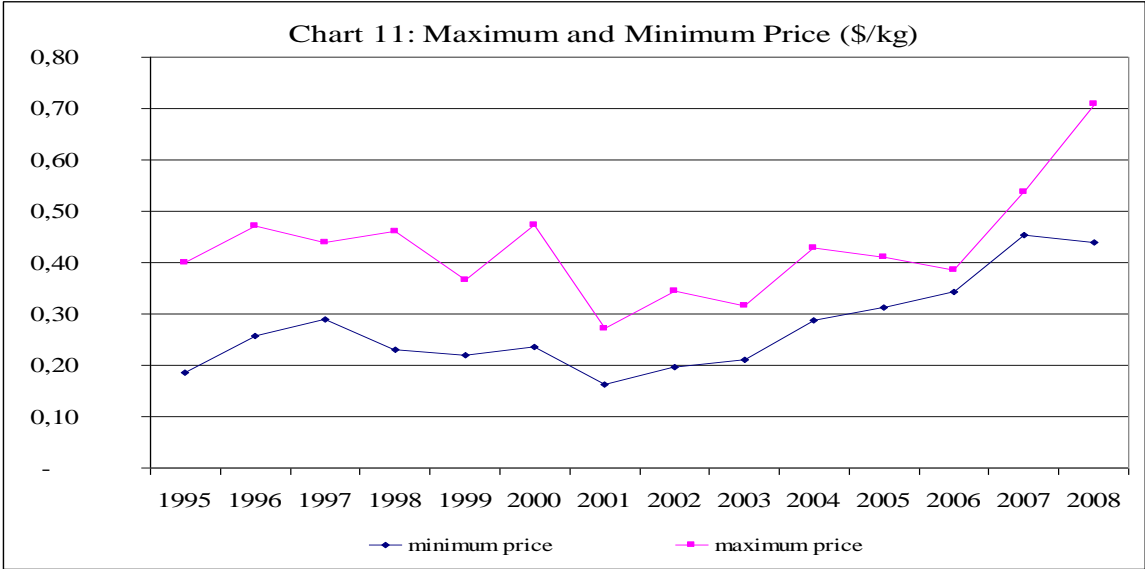
Tomato production and yields in the EU and Turkey are presented in Table 4. Turkey accounts for more than half of the total tomato production of the EU27. But Turkish yield per ha is about 10% lower than the EU25 average. Production technology is also important and the higher yields obtained from hydroponic cultivation techniques compared to conventional production methods play a significant role in explaining differences in yields.

Approximately 15 % of tomato production is lost during harvest. These losses are between 4-10% in the major producing countries of the EU (table 4).

### 6.3 Tomato Prices

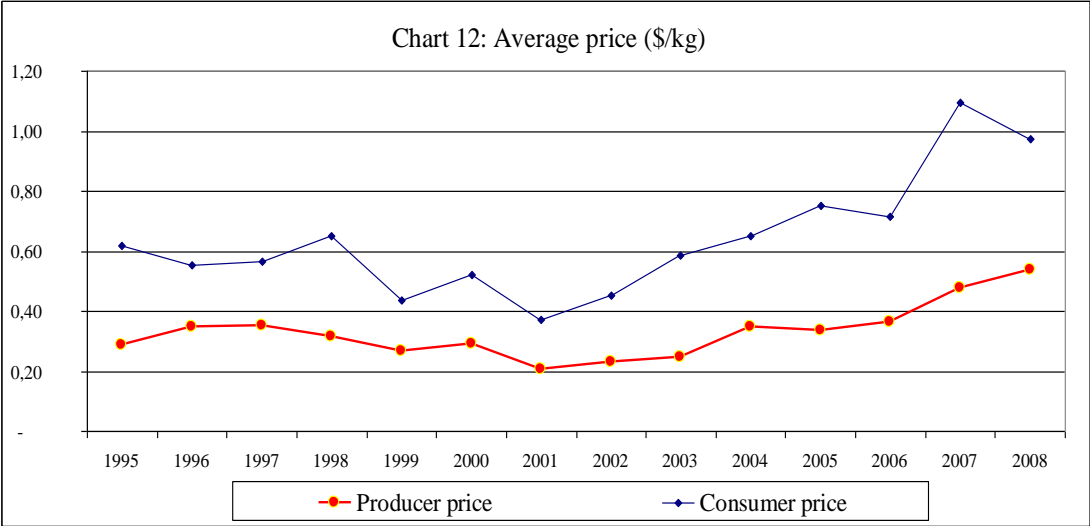
Prices of fresh vegetables may fluctuate heavily. Fluctuations in supply and product characteristics such as its easy degradation and perishability are major causes of price variability. Therefore, it is remarkable that the difference between maximum and minimum tomato price paid to the farmer has decrease since 2001 (see Chart 11): the difference between maximum and minimum prices decreased from around 0.20 \$/kg in the second half of the 1990s to less than 0.10 \$/kg in the years up to 2007. The 2008 observations, however, indicate again an increase of the tomato price fluctuations as illustrated by a widening gap between the maximum and minimum prices during the year.





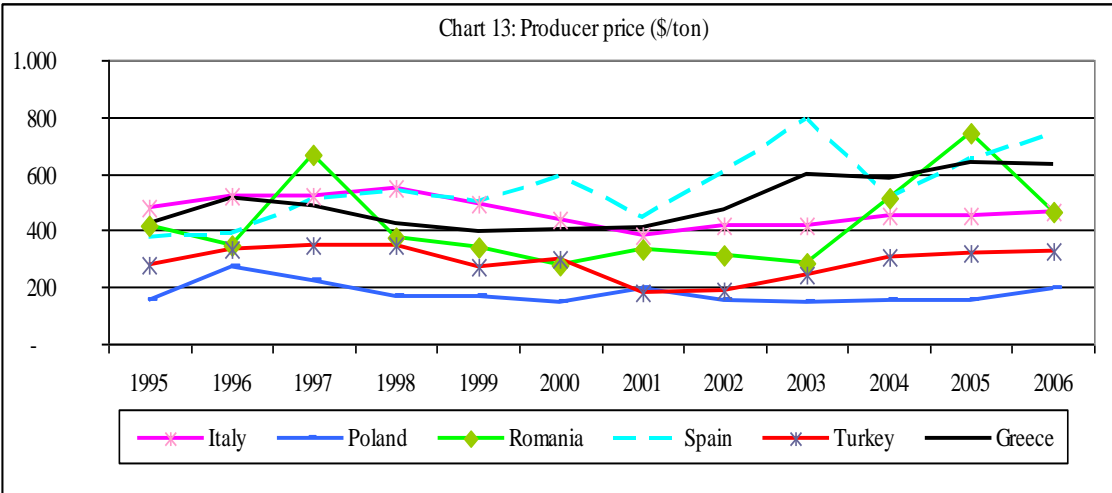
Source: TURKSTAT

As can be read from chart 12 the increase in consumer prices for tomatoes has been show stronger than the increase of the average tomato producer prices from 2001 onwards. The difference between average producer and consumer prices have gone up from 0.33 \$/kg to 0.43 \$/kg between 1995 and 2008.



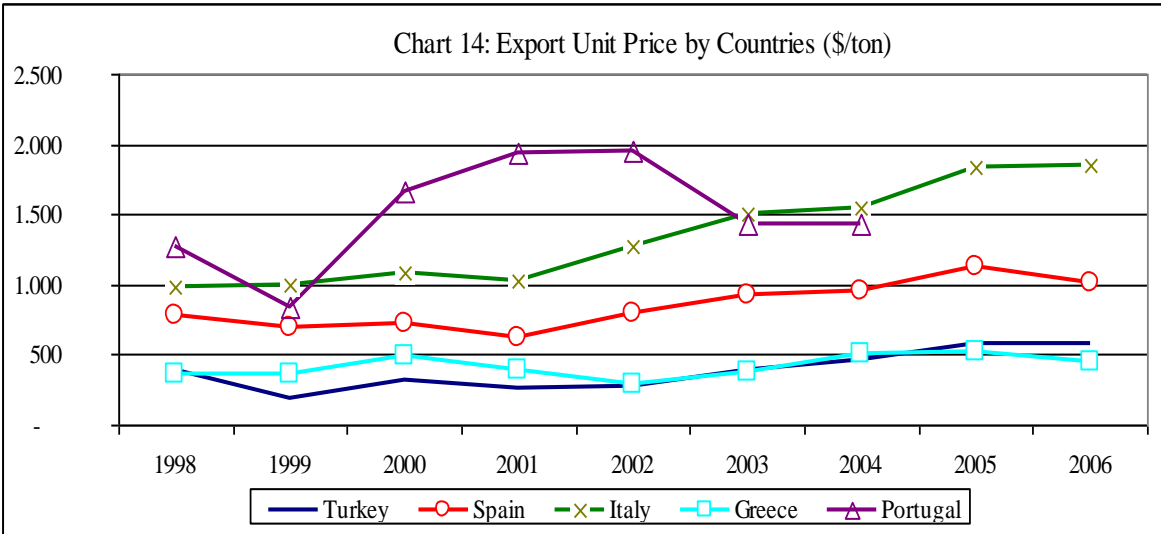
Source: TURKSTAT

Chart 13 shows that producer prices in Turkey were lower compared to other important producer countries except for Poland. The highest producer prices were registered in Spain.



Source: TURKSTAT, fao.org

Turkey’s export prices were lower compared to those of other Mediterranean countries, yet close to those of Greece (Chart 14). Turkey’s most important export markets are Russia and Saudi Arabia, while the Mediterranean EU countries exporting mainly to other EU countries. A Customs Union Agreement between Turkey and EU has been established by the association council decision no:1/95, yet excluding agricultural products. Many important fresh fruits and vegetables including tomato are subject to the EU entry price system following the association council decision No:1/98 expanding the preferential (concessional) regime between Turkey and EU. While the implementation of the entry price system varies per product the system is applied to tomato all year around ([www.tarim.gov.tr](http://www.tarim.gov.tr)).



Source: Keskin vd. 2005, [www.fao.org](http://www.fao.org)

Trends in foreign trade prices of Turkey's tomato and tomato based products between 1994 and 2007 are presented in Table 5. Export prices of fresh tomato show an increasing trend since 2001 and reached over 800 USD in 2007. The same tendency is being observed for other, processed products, although the increase of export prices is highest for fresh tomatoes. As shown in Table 5, import prices of processed tomato products are higher than export prices. For fresh tomato, import prices are generally lower than export prices.

Table 5: Export and Import unit prices for Turkey's tomato and tomato based products

	Export (\$/ton)								
	1994	2000	2001	2002	2003	2004	2005	2006	2007
Fresh tomato	360	313	256	276	388	466	583	577	804
Tomato sauce	780	536	608	622	669	730	870	-	-
Catsup and other tomato sauces	810	677	557	638	741	811	839	874	-
Canned tomato	470	466	459	491	564	642	706	-	-
Frost tomato	400	317	308	330	390	445	431	-	-
Dried tomato	3.640	3.147	2.726	2.480	2.562	2.693	2.735	2.856	-
	Import (\$/ton)								
	1994	2000	2001	2002	2003	2004	2005	2006	2007
Fresh tomato	130	-	139	391	795	398	558	-	-
Tomato sauce	460	715	644	880	924	874	-	-	-
Catsup and other tomato sauces	1.080	1.160	1.451	791	1.452	1.702	1.805	1.753	-
Canned tomato	-	6.000	94	-	-	1.450	-	-	-
Dried tomato	5.270	3.355	3.234	2.982	3.399	2.741	3.267	3.228	-

Source: Keskin vd. 2005., TURKSTAT, akib.gov.tr

Note: Some of the figures are not available due to information secrecy.

#### 6.4 Gross margins for tomato production

Production value, variable costs and gross margins of production under glass and/or plastic and tomato growing in open field are presented in Table 6. The highest gross margin in tomato production is achieved by the greenhouse gartner and is 55,000 YTL per ha. The lowest margin is generated at open field cropping and is 3,800 YTL per ha.

Table 6: Gross Margin of tomato production in Turkey (YTL/ha, 2006)

Unit	Glass greenhouse <sup>1</sup>	Open field <sup>1</sup>			
		Bursa	İzmir	Eskişehir	Çanakkale
Production value	170,000 kg*0,65 = 110.500	50000*0,30 =15.000	40500*0,37 =14.985	58310*0,26 =15.160	60000*0,15 =9.000
<b>Total variable costs</b>	55.352	4.150	5.630	7.585	5.145
Variable costs/kg	0,33	0,08	0,14	0,13	0,09
Variable costs/m2	5,54	0,42	0,56	0,76	0,51
<b>Gross margin (GM)</b>	55.148,0	10.850,0	9.355,0	7.575,6	3.855,0
<b>GM/kg</b>	0,32	0,22	0,23	0,13	0,06
<b>GM/m2</b>	5,51	1,09	0,94	0,76	0,39

Source: <sup>1</sup> calculated through using data of provincial directorate of agriculture

<sup>2</sup> calculated data of a firm making contracted production.

The most important variable costs in the production process are expenditures for inputs like seeds, fertilizers and pesticides, and for labor. 21%-38% of total production costs are linked to input costs in the open field production system. Input costs for these items in greenhouse production are around 44% while labor costs varies between 20%-40% of total variable costs.

Table 7: Comparison of gross margin of tomato production in Turkey and Romania (Euro/ha)

Unit	Romania (2001)		Turkey (2006)*	
	(Ley)	(Euro)	(Euro)	
Sales	30000 kg*5,500 =165.000.000		6.594	9.322
<b>Total Direct Costs</b>	106.000.000,00		4.236	3.876
Direct Costs/kg	3.533,33		0,14	0,07
Direct Costs/m2	10.600,00		0,42	0,39
<b>Gross margin</b>	59.000.000,00		2.358	5.831
<b>Gross margin/kg</b>	1.966,67		0,08	0,11
<b>Gross margin/m2</b>	5.900,00		0,24	0,58

Source: Berkum, S. and Ravensbergen, P. 2001.

Note: Exchange rate of 15 June 2001 ve 15 June 2006 is used.

(1 Lei =25,022 Euro; 1 Euro=1.650.000 TL).

\* average of open field production

Table 7 compares the gross margin of an average Turkish open field tomato producers with one in Romania. The data indicate a more than two times higher gross margin in Turkey. Yields per ha are 1.7 times higher than in Romania but production value is only 1.4 times higher than Romania, indicating that Romanian prices are higher than in Turkey (also shown in Chart 13).

## 7. SWOT ANALYSIS

Developments in production, consumption and competitiveness are determined by external influences as well as internal dynamics. Today it is necessary to direct production to demand and to take into account especially the EU internal market rules and international agreements. Therefore, it is essential for the Turkey's tomato sector to be aware of its strong and weak sides and the threats caused by external influences and transforming them into opportunities. Major structural problems are the sector's small-scale production structure, the inadequacy of farmers organization especially in relation to the marketing of their produce, the lack of storage facilities causing high production losses, and the slow improvements at farm level to comply with requirements of good agriculture practices and in the supply chain to comply with internationally accepted standards of quality and food safety.

**Strengths and Weaknesses:**

	<b>Strengths</b>	<b>Weaknesses</b>
<b>Production</b>	Suitable natural conditions for tomato growing and the fact that tomato can be grown in every region	Structural problems <ul style="list-style-type: none"> <li>❖ The low productivity in comparison with EU countries</li> <li>❖ Small and fragmented land structure and small holding size</li> </ul>
		Big production losses from producer to consumer
		A production made as per natural condition at great level and its susceptibility to seasonal changes
		Lack of a definite supporting policy
<b>Trade</b>	Natural conditions provide possibility for more production	Being easily degradable product
		Complexity of marketing structure (long marketing chain and activity of many actors)
		Inefficiency of producers in marketing channel (inefficient study of producer unions and cooperatives)
		Need for more progress on traceability and standards
		Lack of storage units
<b>Processing Industry</b>	modern facilities and production oriented at export.	Low capacity usage rate
		Shortness of processing period because of difficulties in fresh material supply
	Increased demand of industry type of tomato sauce	Difficulties experienced in suitable amount and quality product during processing period
	Production increase in various processed products as a response to increased foreign demand	

**Opportunities and Threats:**

	<b>Opportunities</b>	<b>Threats</b>
<b>Production</b>	Increased efficiency of producer organizations in marketing (resulting in better prices and increased income of farmers)	Climate change and deterioration of ecological balance
	Positive effect of progress in good agriculture practices to quality and standards	
	Developments on food safety in the world and increasing demand for organic agriculture products	
	Start of EU membership process	
<b>Trade</b>	<ul style="list-style-type: none"> <li>• size of domestic market (73 million people)</li> <li>• strong traditions in fresh vegetable and fruit consumption (at breakfast, etc.)</li> <li>• Turkey’s young population with high consumption per capita</li> <li>• Increasing trend in fruit and vegetable consumption because of health concern</li> </ul>	Staying out of community preference related to trade with EU
	Trading within the scope of full membership to EU and community preference	
<b>Processing Industry</b>	Diversification into products increasingly demanded such as dried tomato	China’s entry to market by low cost products and its efficiency in world trade
	Possibility for the increase in capacity usage rate	

## 8. PRIORITY POLICY OBJECTIVES

Main problems of the agriculture sector stem from an inadequate economic organization of the supply chain from producer up to the consumer. Both Agricultural Cooperatives with their long historical background and Producer Unions based on the Law No: 5200 in 2004 have not developed satisfactorily. Nevertheless, small size agriculture holdings are prevalent in Turkey using traditional technology while their capital base is insufficient to modernise, to increase their scale of production and to increase labor and land productivity. In the vegetable subsector, with its perishable and therefore easily degradable products, an efficient organization of the marketing of the produce is very important, to produce and sell quality products for (to the farmers) profitable yet to the consumers reasonable prices..

Therefore, providing an organization of producers which removes drawbacks of the small-scale agriculture holdings and maintain the economic sustainability of holdings should be a priority objective of the agricultural support policy. By establishing effectively and efficiently operating farmers organisations the following matters would be possible (see also the Target Tree below designed after a brainstorm session on 1) identifying the main causes and effects of a problem [Problem Tree] and 2) identifying main factors/aspects to would contribute to solving that problem):

- Supply of inputs from reasonable price
- Decrease of production costs
- Increase of opportunities to get credit
- Smoothly align with quality and food safety standards
- Increase in competitiveness
- Enhance producers' options for storing, packaging, processing and refrigerated transport facilities
- Increased efficiency of producers in the marketing channel
- Increase in producer welfare

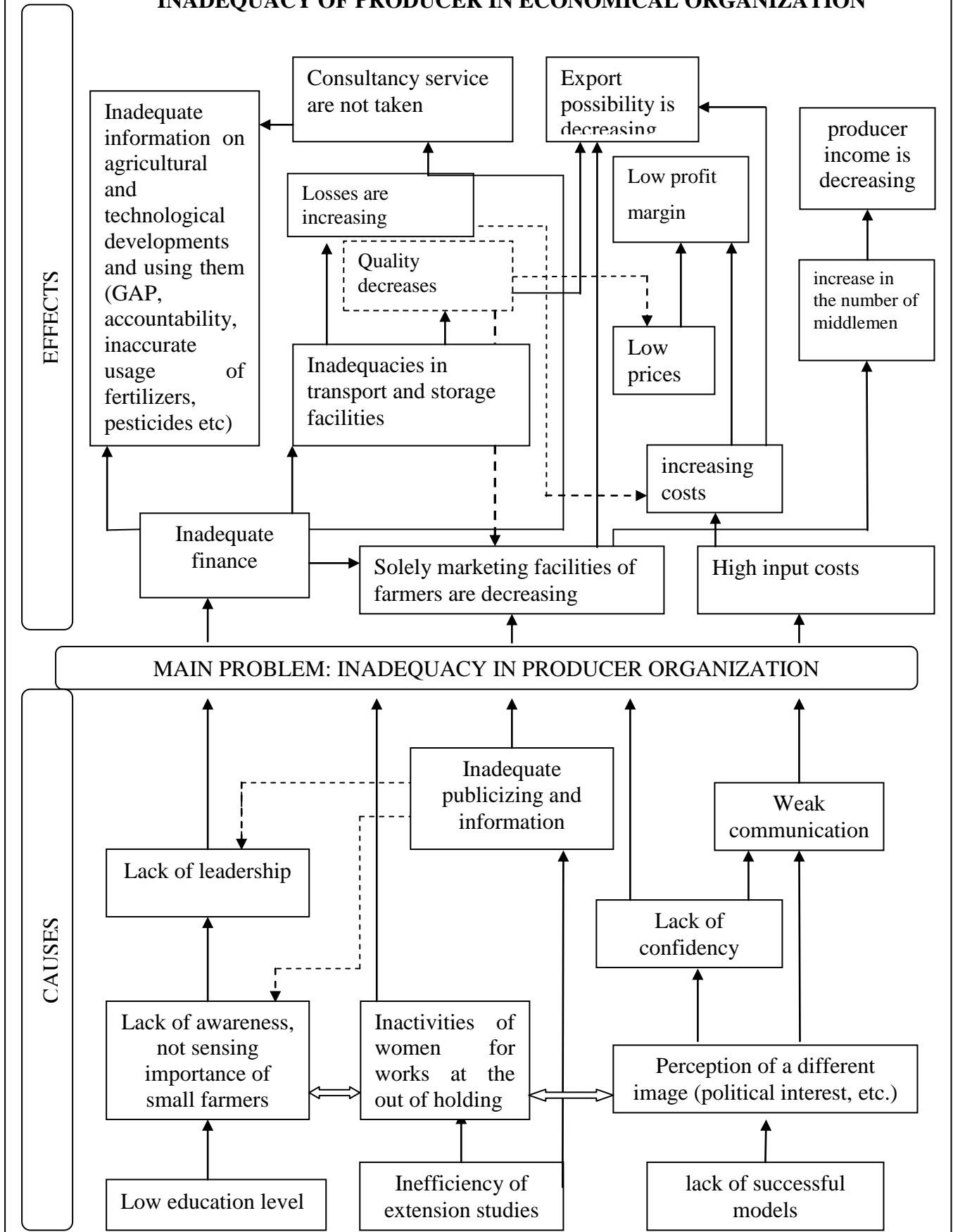
Besides, contributions described at producer level will lead to increase in production value and export incomes at macro level too.

The tomato yield per hectare is higher than the EU27-average but harvest losses are relatively high. Annual losses in tomato production of Turkey are equal to the volume used for processing tomato sauce. Lack of storage facilities, the length of the marketing channel and lack of transport facilities are factors causing these losses. This leads to a suboptimal

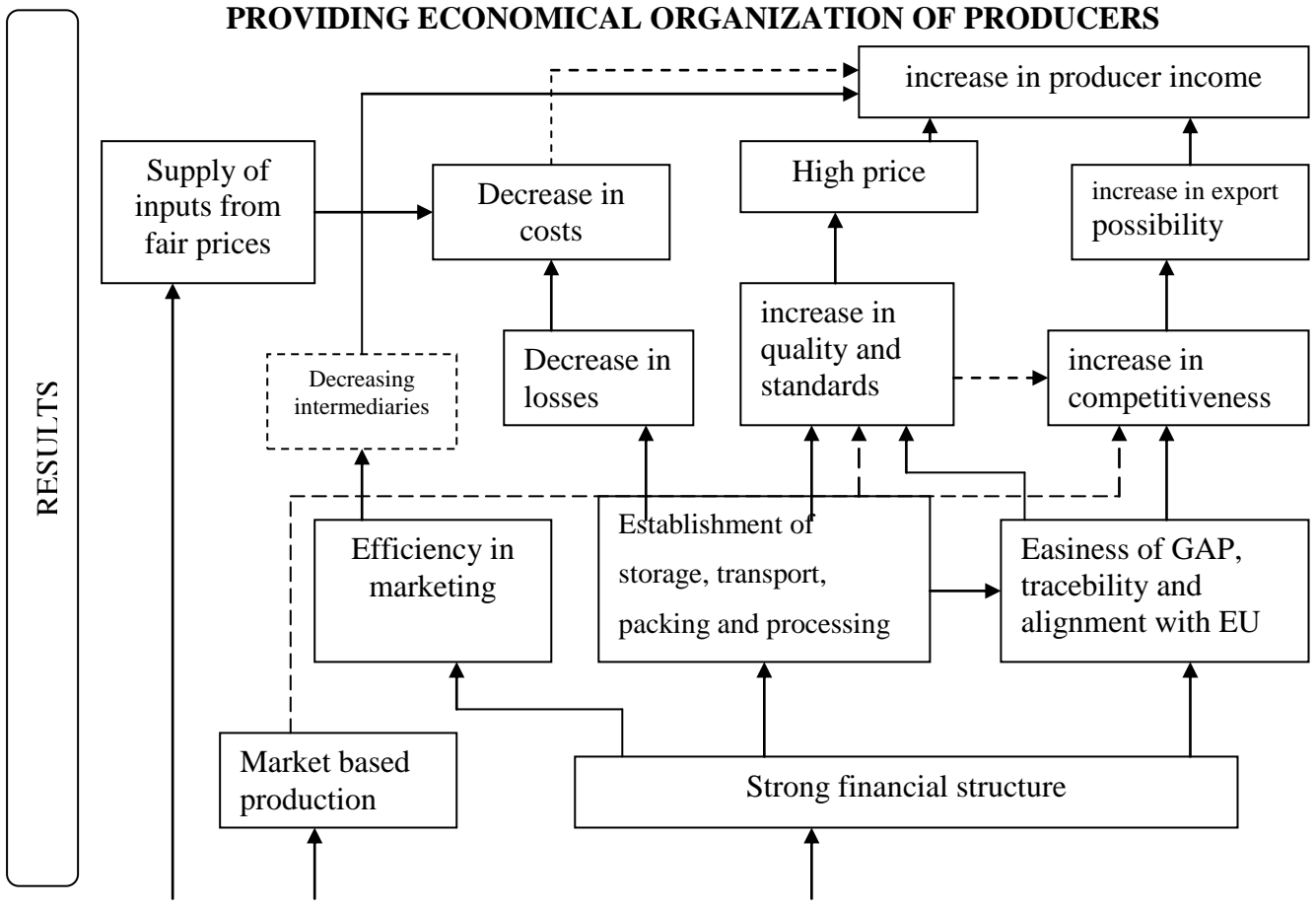


exploitation of market opportunities both in the domestic and in the export market. Therefore, to facilitate the sector's activities to decrease harvest losses would be another priority objective of government policies to enhance the sector's competitiveness.

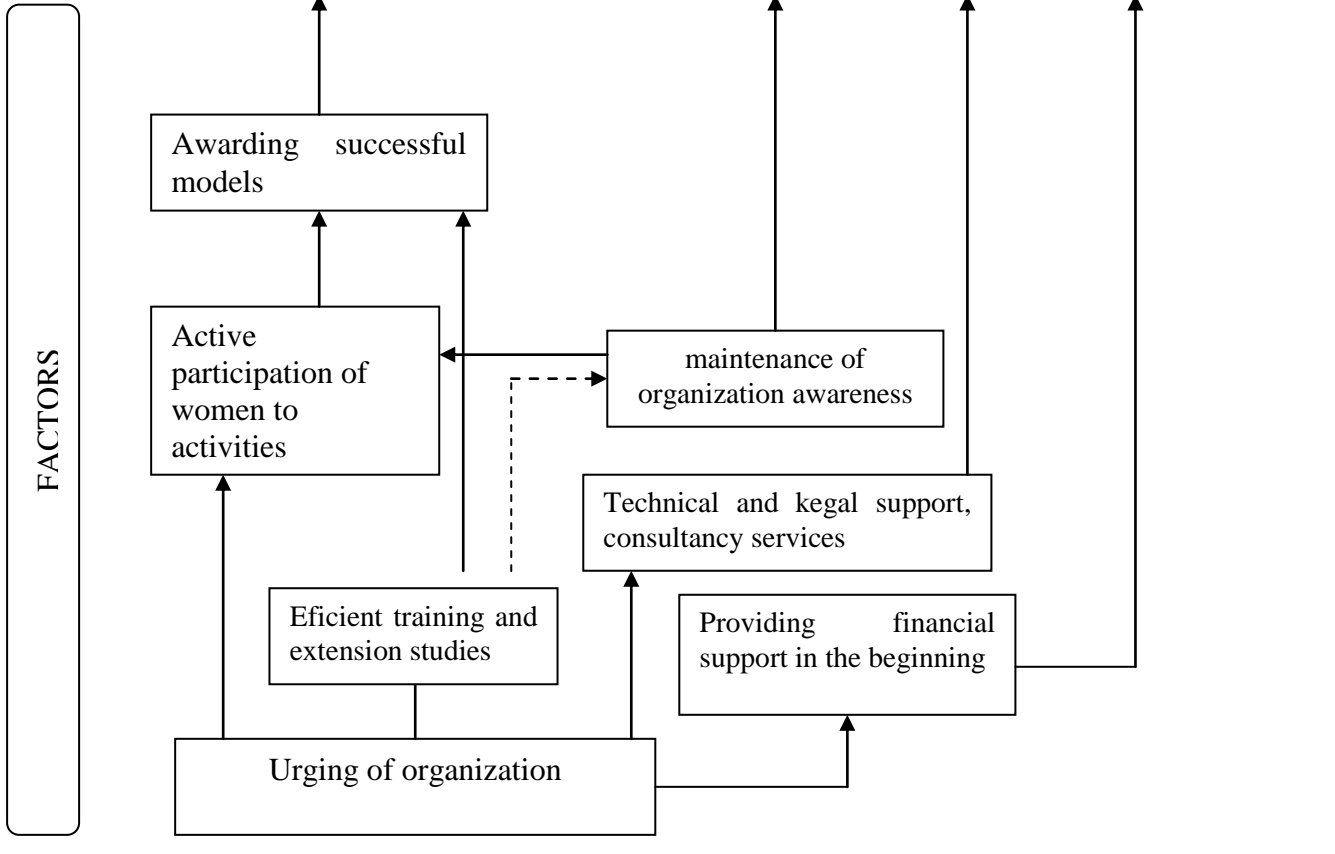
**PROBLEM TREE :  
INADEQUACY OF PRODUCER IN ECONOMICAL ORGANIZATION**



**TARGET TREE :  
PROVIDING ECONOMICAL ORGANIZATION OF PRODUCERS**



**MAIN OBJECTIVE: PROVIDING OF PRODUCER ORGANIZATION**



**REFERENCES**

- TZOB, 2007. Zirai ve İktisadi Rapor 2003–2006, TZOB Yayınları, Yayın No: 265, Ankara.
- TKB, 2006. Belirli Tarım Ürünleri İçin Sektör Analizi Raporlarının Hazırlanması (Meyve ve Sebze, Et), EuropeAid Çerçeve Sözleşme LOT 1. Kırsal Kalkınma ve Gıda Güvenliği Talep No: TURKEY- Altun/sapard/Tr 0406.01/FWC/022, Taslak Nihai Rapor, Türkiye Eylül 2006.
- TKB, 2006a. Ortak Piyasa Düzenleri Alt Çalışma Grup Raporları, Yaş Meyve ve Sebze Alt Çalışma Grubu, Tarım ve Köyişleri Bakanlığı Strateji Geliştirme Başkanlığı, Cilt 3, s.78-128.
- Berkum, S., Ravensbergen, P. 2001. Fruit and Vegetables Sector Analysis, page 149, Ministry of Agriculture, Forest; Water and Environment, Bucharest, 2003.
- DPT, 2008. Tarım Stratejisi 2006-2010, [www.dpt.gov.tr](http://www.dpt.gov.tr) (26.07.008).
- Koç, A. 2006. Türkiye’de Gıda Perakende Sektöründe Değişim Süreci ve Yaş Meyve Sebze Sektörü, 23 Kasım 2006, Antalya.
- Koç, D., 2003. İhracatta Pratik Bilgiler- Yaş Meyve Sebze Sektörü- , İgeme Yayınları, 2003.
- Sarısaçlı, İ.E., 2006. Salça, [igeme.gov.tr](http://igeme.gov.tr).
- Keskin, G., Çakaryıldırım, N., 2005. Türkiye’nin Sebze Üretimi ve Dış Ticareti, TEAE Bakış, Sayı 8, Nüsha 8, Aralık- 2005, Ankara.
- Keskin, G., Çakaryıldırım, N., Dölekoğlu, C., 2005. Domates ve Domates Salçası Durum - Tahmin :2005/2006, TEAE Yayın no: 140, Ankara.
- Keskin, G., Gül, U., 2004. Domates, TEAE Bakış, Sayı 5, Nüsha 13, Nisan- 2004, Ankara.
- Keskin, G., Çakaryıldırım, N., 2003. Örtüaltı Sebze Yetiştiriciliği, TEAE Bakış, Sayı 4, Nüsha 8, Eylül- 2003, Ankara.
- Productschap Tuinbouw, 2006 ([www.tuinbouw.nl](http://www.tuinbouw.nl)).
- Rother, B., 2003. Qualitätsmanagement- und Qualitätssicherungssysteme in der Land- und Ernährungswirtschaft, Bayerische Landesanstalt für Landwirtschaft, Institut für Ernährungswirtschaft und Markt, München ([www.lfl.bayern.de/iem/qualitaetssicherung/06203/linkurl\\_0\\_17.pdf](http://www.lfl.bayern.de/iem/qualitaetssicherung/06203/linkurl_0_17.pdf))
- Sayın, C., Mencet, M.N., Taşcıoğlu, Y., 2004. Avrupa Birliği’nde EUREPGAP Uygulamaları ve Yaş Meyve ve Sebze İhracatımıza Olası Etkileri, Türkiye VI. Tarım Ekonomisi Kongresi 16-18 Eylül 2004, Tokat.
- Tüzel, Y., Gül, A., Daşgan, H.Y., Özgür, M., Özçelik, N., Boyacı, H.F., Ersoy, A., 2005. Örtüaltı Yetiştiriciliğinde Gelişmeler, Türkiye Ziraat Mühendisliği VI. Teknik Kongresi, Bildiriler, Cilt; 551-563, 3-7 Ocak, 2005, Ankara.
- [www.lfl.bayern.de](http://www.lfl.bayern.de)
- [www.tuik.gov.tr](http://www.tuik.gov.tr)
- [www.fao.org](http://www.fao.org)
- [www.soel.de](http://www.soel.de)
- [www.kkgm.gov.tr](http://www.kkgm.gov.tr)
- [www.fas.usda.gov](http://www.fas.usda.gov)
- [www.aib.gov.tr](http://www.aib.gov.tr)

## Turkish Cereal Sector Analysis

Hüsnu EGE Deniz DÖNMEZ Neslihan YILMAZ John BELT

### 1. OVERVIEW of the TURKISH CEREAL SECTOR

#### 1.1. Sector Definition

The grain sector in Turkey is a large sector: almost seventy percent of all farms in Turkey produce grain. The sector involves input supply, production, marketing and processing of wheat, barley, maize, paddy rice, oat and millet.

#### 1.2. Production Value

Grain production contributes with 21% to total crop production value and 12% of total agricultural production value (figures for 2006). Although the share of grain production value in crop production and total agricultural production value gradually increased in the years up to 2004, the share declined somewhat since then (see Table 1).

Table 1. Total Agricultural Production Value and Percentages of Cereals

Year	Total Agricultural Production Value (million TL)	Total Crop Production Value (million TL)	Total Field Crops Value (million TL)	Total Cereals production Value (million TL)	Share of Cereals in Total Crop Production Value (%)	Share of Cereals in Total Agricultural Production Value (%)
2000	26.724	14.920	6.601	3.093	21	12
2001	34.389	20.017	8.903	4.386	22	13
2002	52.135	31.768	14.405	7.029	22	13
2003	68.393	40.706	18.042	9.463	23	14
2004	79.649	45.680	21.474	11.740	26	15
2005	88.365	50.940	21.523	12.399	24	14
2006	96.357	54.515	20.077	11.712	21	12

Source: TURKSTAT

Grain is produced on almost 72% of the total planted area in Turkey. Wheat is the most important crop with a 67% share of total grain production, barley production is second in importance with 26% and maize production follows with 4%.

Table 2. Cereal Industry Production Value

	2000	2001	2002	2003	2004	2005
Total value added in food industry (million YTL, real prices of 1998)	6.682.262	6.399.766	6.691.849	7.031.629	7.496.129	7.923.269
Share of Cereals and starch industry in total value added	2.592.462	2.640.893	2.687.430	2.788.291	2.885.010	2.992.304
Share of Cereals and starch Industry in total value added (%)	38.8	41.3	40.2	39.7	38.5	37.8

Source: SPO

The share of the grain industry in the total value added of the food industry is high: in the range of 38-41% between 1999 and 2005. Although there has been a continuous decreasing trend since 2001, grain products still play an important role in Turkish food industry (See Table 2).

### 1.3. Production, Consumption and Trade

#### 1.3.1. Wheat

There has been no significant change in the area under wheat over the last 10 years, ranging between 9.2 and 9.4 million hectare, yet 'only' 8.5 million hectare in 2006. During the last 3 years wheat production fluctuated between 19 and 20 million ton. There has been an increase in wheat yields over the last 5 years: in 2005 wheat yield reached 2.324 ton/ha, an increase of 12% compared to 2002.

Table 3. Wheat Production Area, Yield and Production

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Production Area ( 000 ha)	9.350	9.340	9.400	9.380	9.400	9.350	9.300	9.100	9.300	9.250	8.490
Yield (ton/ha)	1.979	1.997	2.234	1.919	2.234	2.032	2.097	2.088	2.258	2.324	2.356
Production ( 000 ton)	18.500	18.650	21.000	18.000	21.000	19.000	19.500	19.000	21.000	21.500	20.010

Source: TURKSTAT

Wheat production predominantly takes place in dry and marginal areas, which may affect yields negatively. Using certificated wheat seed is one of the most important factors to increase wheat yield. The yield rise over the last years is a result of the increased use of certificated seed.

Table 4. Certificated Seed Usage

ind	Estimated Seed Need According To Renewal Time (Ton)	Distributed Amount (Ton)			Average Distribution Amount In The Last Three Years (Ton)	Distribution ratio meeting need in 2006(%)
		2004	2005	2006	2004-2006 (Average)	
Wheat	616.667	229.029	173.386	204.526	202.314	33
Barley	243.334	18.499	21.643	25.106	21.749	9
Hybrid Maize	18.000	13.762	18.588	15.103	15.818	100
Paddy Rice	8.500	1.297	1.289	1.722	1.436	17

Source: MARA

Wheat is mainly used for human consumption in Turkey. Beside this, nearly 1 million ton of low quality wheat is used for livestock feed (table 5).

Table 5. Wheat Supply and Use in Turkey (1000 Ton)

	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
<b>SUPPLY</b>										
Production	18.650	21.000	18.000	21.000	19.000	19.500	19.000	21.000	21.500	20.010
Net Production	15.484	17.577	15.066	17.577	15.903	16.321	16.815	19.320	19.780	18.409
Imports (1)	1.675	2.002	1.472	500	850	1.505	1.500	527	36	715
Beginning Stocks	3.204	3.205	4.217	2.397	2.465	1.713	1.856	2.702	2.734	2.424
Total Supply	20.363	22.784	20.755	20.474	19.218	19.539	20.171	22.549	22.550	21.548
<b>DISAPPEARANCE</b>										
Total Domestic Use	15.627	15.818	16.008	16.309	16.605	16.694	16.764	17.595	17.297	17.502
Food	12.835	13.026	13.220	13.417	13.617	13.820	14.026	17.235	14.447	14.662
Seed	1.692	1.692	1.688	1.692	1.688	1.674	1.638	1.860	1.850	1.840
Feed	1.100	1.100	1.100	1.200	1.300	1.200	1.100	1.500	1.000	1.000
Exports(1)	1.531	2.749	2.350	1.700	900	989	1.030	2.221	2.829	1.306
Total Disappearance	17.158	18.567	18.358	18.009	17.505	17.683	17.794	19.816	20.126	18.808
Total Ending Stocks	3.205	4.217	2.397	2.465	1.713	1.856	2.378	2.734	2.424	2.740

Source: AERI calculations from TURKSTAT, TMO data

(1) Wheat equivalence

In Turkey, wheat import generally takes place when the domestically produced wheat is of low volume and/or quality. In addition, imports occur when external prices are lower than domestic prices. There has been a significant decrease in imports over the last few years because quality of domestic wheat has improved significantly.

Recently, there has been an increase in the consumption of processed grain products following increasing population growth. In 2005 annual consumption per capita reached 9.1 kg for rice, 65.2 kg for bread, 6.0 kg for pasta. The highest increase was for pasta consumption which increased with 54% between 1994 and 2005. In Turkey, bread has the highest share in total food expenditures.

Table 6. Annual Consumption Amount Per Person and Share of it in Total Food Expenditure

	1994		2002		2003		2004		2005	
	Amount (kg)	%	Amount (kg)	%	Amount (kg)	%	Amount (kg)	%	Amount (kg)	%
Rice	7,5	2,3	7,3	1,9	7,7	1,8	8,2	1,8	9,1	2,0
Bread	63,6	10	59,5	10,7	65,4	11,9	62,9	10,2	65,2	9,6
Pasta	3,9	1	5,7	0,9	5,5	0,9	4,8	0,7	6,0	0,8

Source: TURKSTAT

### 1.3.2. Barley

The production area under barley has been rather constant between 3.6 and 3.7 million hectares over the last 10 years. During the last two years production has increased while during the last four years there has been an increase in yield. Yields are fluctuating between 2.110 and 2.616 ton per hectare.

Table 7. Barley Production Area, Yield and Production

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Planted Area (000 ha)	3.650	3.700	3.750	3.650	3.629	3.640	3.600	3.400	3.600	3.650	3.650
Yield (ton/ha)	2.192	2.216	2.400	2.110	2.204	2.060	2.306	2.382	2.500	2.603	2.616
Production (000 ton)	8.000	8.200	9.000	7.700	8.000	7.500	8.300	8.100	9.000	9.500	9.551

Source: TURKSTAT

Up to ninety percent of barley production is used for livestock feed. In addition, 200,000 ton of barley is processed as malt for the beer industry. Turkey imports barley for its beer and malt industry. Barley export only takes place if TMO (the Turkish Grain Board, see Box 5) faces a surplus.

Table 8. Barley Supply and Use in Turkey (1000 Ton)

	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
<b>SUPPLY</b>											
Production	7.500	8.000	8.200	9.000	7.700	8.000	7.500	8.300	8.100	9.000	9.551
Net Production	6.825	7.280	7.457	8.010	6.853	7.120	6.675	7.387	7.209	8.010	8.455
Imports	57	41	26	217	60	50	53	47	250	135	70
Beginning Stocks	524	1.174	2.002	1.914	1.605	1.487	1.385	950	742	1.086	1.276
Total Supply	7.406	8.495	9.485	10.141	8.518	8.657	8.113	8.384	8.201	9.231	9.802
<b>DISAPPEARANCE</b>											
Malt	170	175	175	180	190	195	200	210	200	200	200
Seed	705	730	740	754	730	710	728	720	680	730	730
Feed	5.353	5.364	5.689	6.345	5.962	6.253	5.688	6.194	6.205	7.005	7.428
Total Domestic Use	6.228	6.269	6.604	7.279	6.882	7.165	6.616	7.124	7.085	7.935	8.358
Exports	4	224	977	1.257	150	100	547	518	30	20	300
Total Disappearance	6.232	6.493	7.581	8.536	7.032	7.265	7.163	7.642	7.115	7.955	8.658
Total Ending Stocks	1.174	2.002	1.914	1.605	1.487	1.385	950	742	1.086	1.276	1.143

Source: AERI TURKSTAT, TMO data



### 1.3.3. Maize

Over the last ten years maize area changed from 550,000 to 536,000 hectares. Because of the increase in output prices and the increase in the use of hybrid seeds, production and yield significantly increased. Yields rose from 4 ton/ha in 2001 to 7 ton/ha in 2005 while production augmented from 2.2 million ton to 4.2 million tonnes.

Table 9. Corn Production Area, Yield and Production (1996-2006)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Planted Area (000 ha)	550	545	550	518	555	550	500	560	545	600	536
Yield (ton/ha)	3.636	3.817	4.182	4.434	4.144	4.000	4.200	5.000	5.505	7.000	7.110
Production (000 ton)	2.000	2.080	2.300	2.297	2.300	2.200	2.100	2.800	3.000	4.200	3.811

Source: TURKSTAT

Around 60% of the maize production is used in the fodder industry, 20% for on-farm consumption and 20% by the starch industry. Turkey has significantly decreased its maize imports since 2003/04 when imports were up to 1.4 million ton of maize (tabel 10).

Table 10. Turkey Corn Supply and Use (1000 Ton)

	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
<b>SUPPLY</b>											
Production	1.900	2.000	2.080	2.300	2.300	2.300	2.200	2.100	2.800	3.000	4.200
Net Production	1.805	1.900	1.976	2.185	2.185	2.185	2.090	1.995	2.660	2.850	3.990
Imports	1.106	846	755	981	1.309	672	1.223	1.411	1.165	480	80
Beginning Stocks	96	554	573	397	412	741	116	559	478	670	263
Total Supply	3.007	3.300	3.304	3.563	3.906	3.598	3.429	3.965	4.303	4.000	4.333
<b>DISAPPEARANCE</b>											
Seed	13	14	14	14	13	14	4	15	23	27	15
Feed	1.480	1.658	1.799	1.975	2.030	2.200	1.700	2.300	2.450	2.550	2.550
Food	957	1.045	1.087	1.136	1.114	1.260	1.150	1.150	1.150	1.150	1.150
Total Domestic Use	2.450	2.717	2.900	3.125	3.157	3.474	2.854	3.465	3.623	3.727	3.715
Exports	3	10	7	26	8	8	16	22	10	10	150
Total Disappearance	2.453	2.727	2.907	3.151	3.165	3.482	2.870	3.487	3.633	3.737	3.865
Total Ending Stocks	554	573	397	412	741	116	559	478	670	263	468

Source: AERI TURKSTAT, TMO data

### 1.3.4. Rice

Paddy production has been intensified in some regions such as Marmara. During the last ten years the rice area has increased from 55,000 in 1995 to 99,000 hectares in 2005. Following the increase in the planted area, the production volume increased too. Rice production has grown from 168,000 ton in 1995 to 360,000 tonnes in 2005.

Table 11. Rice Production Area, Yield and Production (1996-2006)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Planted Area (000 ha)	55	55	60	65	58	59	60	65	70	85	99
Yield (ton/ha)	3.063	3.000	3.150	3.138	3.621	3.661	3.600	3.434	4.200	4.235	7.030
Production (000 ton)	168	165	189	204	210	216	216	223	294	360	696

Source: TURKSTAT

In terms of consumption, rice is among the most important grain products in Turkey. Between 1996 and 2002 Turkey imported more than it produced, yet during the last 3 years imports have been less than the domestic rice production (table 12).

Table 12. Rice Supply and Use in Turkey (Ton)

	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
	Ton										
Net Paddy Production	263.430	258.500	296.700	320.200	331.400	331.200	340.800	351.560	466.200	571.000	642.500
<b>SUPPLY</b>											
Rice production	168.000	165.000	189.000	204.000	210.000	216.000	216.000	223.200	294.000	360.000	405.000
Imports 1/ 2/	241.897	256.586	291.697	281.674	310.515	312.588	407.364	129.953	288.137	245.000	150.000
Beginning stocks	121	39.233	45.312	50.578	44.798	63.309	84.710	189.528	39.970	61.764	92.357
Total supply	410.018	460.819	526.009	536.252	565.313	591.897	708.074	542.681	622.107	666.764	647.357
<b>DISAPPEARANCE</b>											
Total domestic use	369.735	414.850	474.507	483.260	491.261	499.269	507.197	493.892	551.405	561.407	571.591
Exports 1/ 2/	1.050	657	924	8.194	10.743	7.918	11.350	8.819	8.938	13.000	13.000
Total disappearance	370.785	415.507	475.431	491.454	502.004	507.187	518.547	502.711	560.343	574.407	584.591
Total Ending Stocks	39.233	45.312	50.578	44.798	63.309	84.710	189.528	39.970	61.764	92.357	62.766

1/ All paddy equivalents including. 2/ Rice equivalents.

Source: AERI calculations from TURKSTAT, TMO data

**BOX 1**  
**Cereal Area, Yield and Production for Provinces**

**Adana Province Corn Area, Yield and Production**

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<b>Area (ha)</b>	58.658	100.620	78.960	91.502	84.655	84.617	86.595	78.807	105.482	98.948
<b>Yield(kg/ha)</b>	7.249	5.641	6.416	6.568	7.028	6.550	5.546	6.582	7.162	7.301
<b>Production(ton)</b>	425.194	567.600	506.750	600.952	594.987	554.256	480.256	518.728	755.428	722.394

**Wheat Area, Yield and Production (2003)**

	Area(ha)	Yield(kg/ha)	Production(ton)
Konya	720.440	2.006	1.406.003
Ankara	511.595	2.168	1.108.416
Adana	308.843	3.421	1.056.415
Sanlıurfa	364.483	2.539	925.412
Diyarbakır	303.183	2.302	697.577
Tekirdag	189.474	3.057	579.235

**Barley Area, Yield and Production (2003)**

	Area (ha)	Yield (kg/ha)	Production (ton)
Konya	361.349	2.256	810.469
Ankara	260.502	2.505	646.607
Sanlıurfa	247.763	2.479	614.149
Afyon	152.098	2.836	431.326
Diyarbakır	142.952	2.672	381.811
Eskişehir	125.243	2.608	322.926

**Maize Area, Yield and Production (2003)**

	Area (ha)	Yield (kg/ha)	Production (ton)
Adana	105.482	7.162	755.428
Sakarya	45.164	6.074	274.320
İçel	36.324	7.320	262.678
Osmaniye	27.710	5.646	156.445

**Rice Area, Yield and Production (2003)**

	Area (ha)	Yield (kg/ha)	Production (ton)
Edirne	26 390	3 349	88 392
Samsun	8 172	3 558	29 079
Çorum	6 725	4 231	28 453
Balıkesir	7 082	3 309	23 437
Çanakkale	2 267	4 318	9 790
Sinop	2 695	3 773	10 167

Source: TÜİK

#### 1.4. Structure of Grain Sector

The first stage of the grain sector - the farm level - is characterised by numerous fragmented areas consisting of small or medium sized land holdings (see also table 13). Most wheat and barley production takes place in regions with little rainfall. The dysfunctional land registration system makes it difficult for farmers to obtain credit. Important inputs are expensive because of imported raw material and farmers without sufficient income have difficulties to obtain inputs.

##### **BOX 2. HERITAGE LAW**

A law aiming to make changes in soil protection and area usage has been in force since 09.02.2007 following an official newspaper publication.

According article 8 of this law carrying the topic of classifying agricultural areas and determining an area parcel size, an indicated area size will be accepted as indivisible. Mentioned indivisible characteristic will be recorded in deed office.

An indicated minimum size will be 2 hectare for peremptory agricultural lands and special crop lands, 0.5 hectare for sewed agricultural lands, 0.3 hectare for agricultural lands under cover and 2 hectare for marginal agricultural lands. Agricultural land can not be divided into smaller parcels than the sizes indicated. However, because of land necessities in regions which include greenhouses and the special soil and climate conditions needed crops such as tea, hazelnut and olive planting areas, smaller parcels can occur with the permission of the ministry. If indivisible size of agricultural area is subject to heritage or to common possession, the area can not be divided, sold to a third person, delivered or put into pledge.

By the change in the law, village legal institutions, municipalities, cooperatives and unions and public institutions have a chance to aggregate land.

It is notable that there are a few organized farmer groups which limits the possibilities for farmers to store their production.

### **BOX 3. GRAIN CULTIVATION ACTIVITY IN BIG AND SMALL SIZED HOLDINGS**

As a result of an interview with two grain producer holdings in Ankara- Polatlı:

This information is obtained during the interview with a big holding:

This holding has 3.5 ha agricultural area. 1.5 ha is used for wheat, 0.08 ha is used for common vetch, 0.045 ha is used for sorghum, 0.03 ha is used for maize and rest of the area is used for melon and fallow activities. Wheat productivity declined to 0.31 t/ha while it was 0.5 t/ha in 2006. The holding also has 50 bovines/cows and the produced common vetch is used for animal feeding. This holding is calculating the cost of every production unit separately. Among these production units, animal rearing is the most profitable activity because the holding is producing animal feed itself. Input prices are the main restrictive production factor for this holding. This holding is informed enough about agricultural subjects by the district agricultural organization.

As a result of interview with small holding, this information is obtained:

This holding has 0.5 ha agricultural area. Half of this area is used for barley and soft wheat production; other half part is used for melon production and fallow activities. The holding uses its own labor. The holding isn't calculating costs for separate production activities and doesn't have enough information about the most profitable activity field. It finds agricultural state supports sufficient. Inputs, especially diesel, are really expensive for this holding. Production decisions of this holding will be depend on given support in next agricultural term. This holding sells its produced barley and wheat to merchants in the region. Because of high interest rates, it doesn't want to get credit from Agricultural Credit Cooperatives.

About 40-60% of the grain production is marketed, the rest is used on-farm to meet consumption needs and as seed for next season.

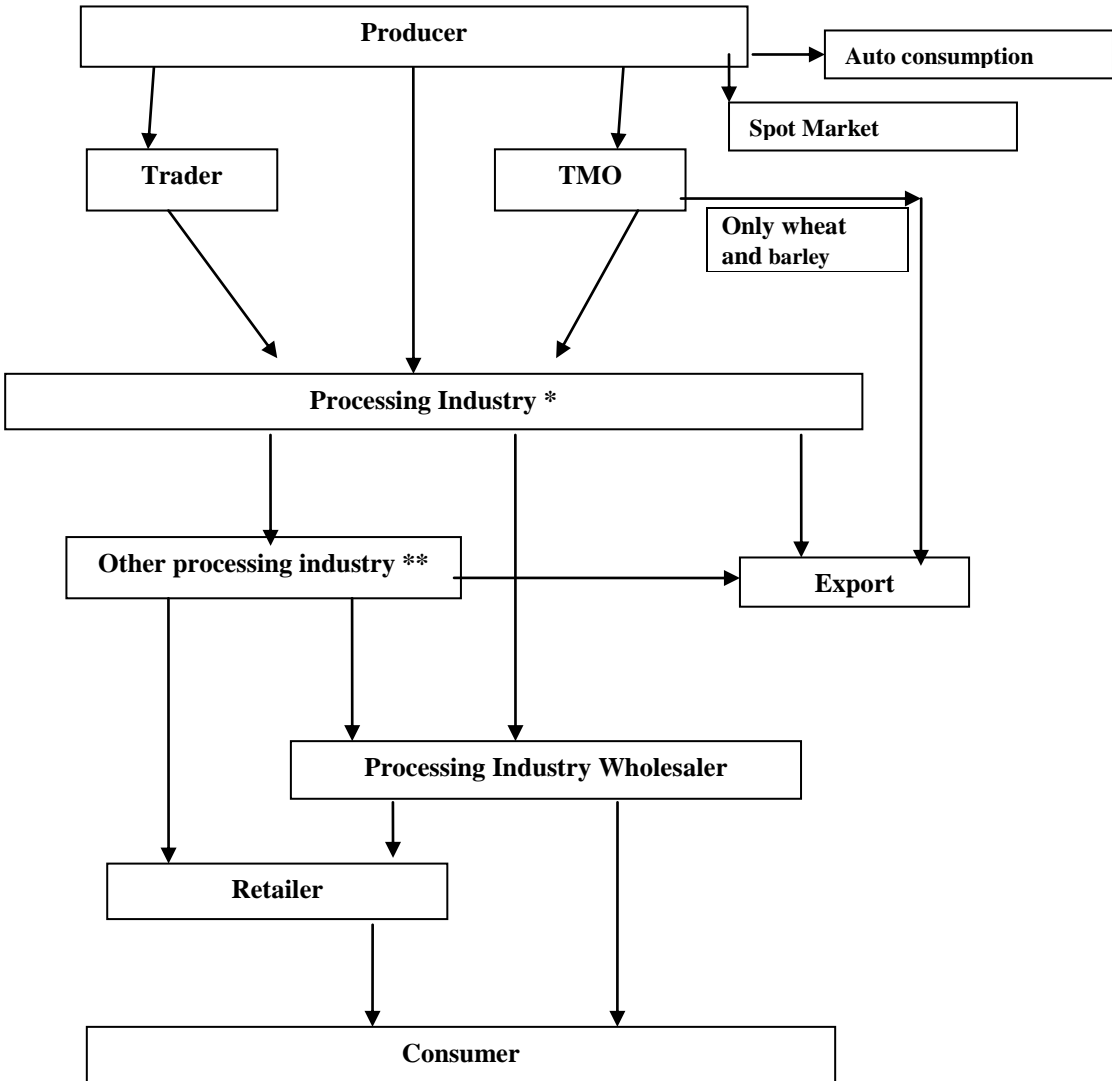
Table 13. Number of grain holdings, their parcels and cultivated area

	Number of Holding (1000)	Number of Parcel(1000)	Cultivated Area (million hectare)	Cultivated Area/Total Cultivated Area(%)
Field Crops	2,064	14,721	12.6	73
Grain	1,953	12,861	10.9	64
Wheat	1,683	9,627	8.3	48
Barley	594	2,183	2	11
Maize	200	643	0.5	3.5
Paddy	20	108	0.08	0.5

Source: MARA Documents, 2006

Farmers can sell their grain directly to processing plants, wholesale markets, TMO and merchants. The wholesale markets operate well, yet their traded volume and number are quite low. Currently, there are 113 wholesalers operating in the grain market. The wholesaler market doesn't attract support, because quality and standardization are important and

producers must pay a fee to trade their product in the wholesale market. In addition, there is no future market which could reduce the farmers' risk



Graphic1. Organisation of Barley, Maize, Wheat and Paddy Rice Market Chains

\* starch, feed (barley, maize), malt (barley), food (maize, wheat, rice)
\*\* starch-based products, beer

It is estimated that the number of industrial food processors has grown from 25 to 40 thousands and that the grain processing industry represents 65.5% of total number of companies in the food industries in 2007.

**BOX 4. FLOUR PLANT ACTIVITIES**

This flour plant operates with 60 tonnes of production capacity a day, although its real capacity is 250 tonnes of production a day. Wheat is purchased from state agricultural holdings, merchants and sometimes directly from producers. To obtain qualified wheat which has not been affected by insects or diseases is the main problem of the plant. Because qualified wheat is expensive the plant sometimes mixes wheat of less quality with high quality wheat. Produced flour is sold to bread factories, especially Istanbul Public Bread Factory. Because of the excessive amount of flour factories operating at the market (see table 14) and expensive input prices, this wheat flour factory faces decreasing profits.

The established grain processing capacity is sufficient to process home-grown and imported grain. There is an oligopolistic market structure in the production of starch and beer considering that four large companies have 96% of the starch market while another four companies dominate 76% of the beer and malt market (MARA 2006).

Table 14. Number of Grain Processing Industry Holdings

<b>Kind of Plant</b>	<b>Plant Number</b>
Flour Plants	1,091
Feed Plants	468
Pasta Plants	24
Boiled and Pounded Wheat Plants	72
Biscuit Plants	22
Semolina Plants	5
Beer Plants	5
Paddy Plants	100
Starch-Glucose Plants	5

Source: DPT

There is an oligopolistic market structure in the agricultural input industry too. This explains, next to high prices of imported raw material, the high input prices in Turkey. Because of their low income farmers have limited access to the formal credit system to buy inputs; this hampers an increase in yields.

Fertiliser consumption data in E.U. countries and Turkey are presented in Table 15. According to this table, Bulgaria, Romania, Estonia and Latvia use less fertiliser per hectare than Turkey. Compared to Turkey, Ireland uses seven times more fertiliser per hectare, United Kingdom five times and Greece two times.

Table 15. Chemical Fertilizer Consumption (Ton) (2002)

	<b>Total fertiliser</b>	<b>Nitrogenous</b>	<b>Phosphate</b>	<b>Potash</b>	<b>Production Area (000ha)</b>	<b>Consumption per unit area</b>
Bulgaria	165.943	152.127	12.410	1.406	3.331	50
Czech Republic	368.844	289.098	49.146	30.600	2.775	133
Denmark	297.001	201.559	33.000	62.442	2.479	120
Germany	2.594.327	1.787.654	327.000	479.673	11.791	220
Estonia	27.007	16.700	4.015	6.292	613	44
Ireland	587.000	360.000	97.000	130.000	1.177	499
Greece	405.000	253.000	107.000	45.000	2.764	147
Spain	2.159.700	1.070.100	601.300	488.300	12.893	168
France	3.968.000	2.279.000	729.000	960.000	18.318	217
Italy	1.432.642	785.314	372.026	275.302	8.241	174
Cyprus	15.406	8.064	5.685	1.657	87	177
Latvia	50.029	34.316	5.708	10.005	973	51
Lithuania	194.000	115.000	35.000	44.000	1.639	118
Hungary	501.321	365.000	68.000	68.321	4.959	101
Malta	700	300	200	200	9	78
Netherlands	336.000	284.000	52.000		1.011	332
Austria	208.300	118.000	47.000	43.300	1.378	151
Poland	1.511.699	831.660	302.590	377.449	13.038	116
Portugal	207.000	101.000	58.000	48.000	1.589	130
Romania	326.123	239.071	72.996	14.056	9.376	35
Slovenia	69.887	33.338	15.794	20.755	168	416
Slovakia	124.384	88.260	18.526	17.598	1.377	90
Finland	293.000	162.000	52.000	79.000	2.217	132
Sweden	268.000	189.000	37.000	42.000	2.654	101
Uni.Kingdom	1.801.000	1.142.000	283.000	376.000	4.495	401
Turkey	1.743.173	1.195.190	474.417	73.566	23.830	73

Source: FAO, TURKSTAT

### 1.5. Pricing

In Turkey grain prices are determined by market forces: prices are mainly determined by quality and the balance of supply and demand. Grain trade is dominated by TMO (the Turkish Grain Board) and wholesalers. Farmers see TMO is as a guaranteed selling place. Next to TMO, merchants and industry buy grain both from farmers and wholesalers. After 2001 TMO purchase prices have been equal to domestic price levels. Contractual production activity is conducted very rarely.

World and domestic grain prices are shown in Table 16. The difference between domestic and world market prices is determined by the customs tariff. Customs tariffs, as approved by WTO, are shown in the Table 17.



**Table 16. Cereal Prices (\$/tonne)**

		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Wheat	Turkey Prices	235	212	153	167	150	153	220	240	258	247
	World Prices	170	135	110	115	132	130	144	166	148	207
Maize	Turkey Prices	212	191	164	150	143	145	210	215	233	270
	World Prices	132	127	145	117	113	119	121	129	99	170

Source: TMO

Customs tariffs have been determined high in order to prevent foreign competition on the domestic market. However, customs tariffs are flexible if there is insufficient market supply. To give an example, maize tariff rates have changed four times in the 2000/01 period (see Table 18).

**Table 17. Tariff rates of cereals (2006)**

	Committed ratio (%)
Wheat	180
Barley	180
Maize	180
Paddy	180
Wheat Flour	102.6

Source: TMO

**Table 18. Maize tariff rates**

	31.12.2000	16.02.2001	28.04.2001	17.08.2001
2000/01	50	25	10	40

Source: AERI, Maize Report, 2007/08

## 1.6. Grain Policies in Turkey

Supporting purchases were conducted by TMO, which aimed to prevent grain prices from decreasing to the level harmful to producer or from increasing to the level detrimental to consumer and to organize market, during along period of time. While in the past supporting prices were determined every year by The Ministerial Committee, since 2002 grain policies changed with the effect that the government initiated TMO supporting purchases were eliminated as well as TMO's price notifications. Since 2002 the TMOs Board of Directors decides when and how much to intervene in the cereal market. The volume of grain purchased by TMO and its share in total production are shown in the following table.

Table 19. TMO Amounts of Grain Purchases, Share of Production and Purchase Price

Year	Wheat		Barley		Maize		Rice	
	Purchase Amount (Ton)	Share in Production (%)	Purchase Amount (Ton)	Share in Production (%)	Purchase Amount (Ton)	Share in Production (%)	Purchase Amount (Ton)	Share in Production (%)
2000	2.959.105	14	508.715	6	28.509	1	40.763	
2001	1.459.434	8	951.837	13	**	-	19.079	
2002	332.811	2	379.655	5	78.596	4	59.231	
2003	544.508	3	27.345	0	381.193	14	130.362	
2004	2.023.401	10	3.423	0	474.302	16	14.855	
2005	4.171.303	19	796.027	8	660.985	16	11.899	
2006	1.456.571	7	724.586	8	0	0	87.212	

Source: TMO, \*\*: Only 9 tonnes of maize purchase

As seen in the table, TMO purchases declined from 2000 tot 2003 but realised more purchases than normal in 2004 and 2005 when production was high.

TMO bought grain from farmers who were recorded in ÇKS (Farmer Registration System) in 2006/07 and from cooperatives in which grain producer farmers were partners. As an exception, a production licence is enough to sell paddy rice to TMO. However, registration to ÇKS is a condition to benefit from other governmental supports. So, paddy farmers who have only paddy production licence can not benefit from those other support means (see table 20 for the supprt instruments).

Additionally, TMO can borrow grain from farmers. In exchange, farmers obtain a receipt paper. The farmers can have a credit using this paper. In addition to this credit facility, according to 2006/10506 Ministrial committee decision, TMO has a competence to pay paddy producers in advance when they lend TMO paddy rice. The advanced amount is determined within the rules of TMO. In 2006/07 period, 255,548 tonnes of wheat, 5,644 tonnes of paddy and 24,830 tonnes of barley were lend to TMO. There was no maize lending to TMO during the period mentioned.

Support to the grain sector included the following measures: Direct Income Payment, subsidies for diesel and chemical fertiliser, seed support and premium support.

The Direct Income Payments (DGD) measure was used as 10 YTL/dekkar for the first time in 2001. The amount was the same during 2006 and 2007.

For 2007 grain farmers received a support of 2.13 YTL/dekkaar for fertiliser and 2.88 YTL/dekkaar for diesel.

In 2007 the support for using certified seed was 5 YTL/dekkaar for wheat, 8 YTL/dekkaar for paddy and 5 YTL/dekkaar for barley whereas there was no support given to certified maize seed.

In 2006 the premium support was 0.035YTL/kg for wheat, 0.067 YTL/kg for maize, 0.025YTL/kg for barley and 0.06YTL/kg.

Table 20. Grain Supports (YTL/Da)

SUPPORT KIND	2001	2002	2003	2004(1)	2005(2)	2006(3)	2007(4)
Direct Support Income	10	13.5	16	16	10	10	10
Diesel Support	-	-	3.9	-	2.4	2.88	2.88
Certificated Seed Support	-	-	-	-	3	5	5
Chemical Fertilizer Support	-	-	-	-	1.6	2.13	2.13
Energy Support in Irrigation(Ykr/KWh)	-	-	-	-	1.7	1.7	1.7

1- 0.025 YTL/Kg premium support was given for maize.

2- 0,05 YTL/Kg premium support for maize, 0.03 YTL/Kg premium support for wheat and paddy, 0.02 YTL/Kg premium support for barley, rye and oat were given.

3- 0.035 YTL/Kg. premium support for wheat,0.067 YTL/Kg. premium support for maize, 0.025 YTL/Kg premium support for barley, rye and oat were given in 2006.

4- 0.045 YTL/Kg. premium support for wheat, 0.035 YTL/Kg premium support for barley, rye and oat were given.

**Kaynak: TMO**

**BOX 5. TMO**

Turkish Grain Board is a State Economic Enterprise as related establishment of MARA, which all its capital belongs to the State and its liability is limited with its capital, having legal personality and autonomy in its activities. TMO consist of general directorate and regional organizations. Regional offices are made up from 203 branches. Intervention purchases are made both from producers and wholesalers. Additionally, TMO stores grain giving receipt to producers at storage receipt system without taking any payment. Wheat, barley, maize, oat, rye, paddy rice are subject to TMO intervention purchase. Besides the competence to rent storages, TMO has nearly 4.5 million tonnes storage capacity. TMO storages are near to ports and to the places where grain production or consumption activity is intensive.

In the Article 4 of the Main Status of Turkish Grain Board, the purpose and the activity subjects of the enterprise is indicated as following:

“Preventing falling the grain prices in country below the normal level in point of producers view and preventing its increase abnormally against the consumer public, taking regularization measures for the market of these products and carrying out the mission to be given by the Decree of the Council of Ministers when required as related to the pulses and oily seed other than grain, carrying out the state monopoly imposed on the opium and narcotic substances, selling and buying these products, providing the required stocks and their protection”.

For fulfillment of the purpose of its establishment, Turkish Grain Board carries out the following missions; By buying and selling the products, which are included in its activity area, on the prices to be determined according to their kind, type and places and providing their required stock and protection, provide stabilization of these products at the market, To purchase from foreign market the products, which are included in its activity area, and their manufactured items when required, To carry out every kind of processes for providing rapid sale of the products and their manufactured items purchased from domestic market at the foreign markets and sell these items to foreign market when required, To buy the wheat at the prices to be declared according to the quality groups determined beforehand within the framework of the mission assigned by the Council of Ministers, To make the protection, drying, cleaning, spraying with chemical substance and calibration processes of the products included in its activity scope, To make general storekeeping activities, To run the silos or other storing institutions present and to be commissioned later, To make the investment, etude, investigation, feasibility, projects, engineering and advisory services related to the its activity matters and/or have them made, To establish storage facilities when required to store the products included in its activity matters and the manufactured items to be obtained from them, To make available the spare parts, vehicle and machinery necessary for maintenance and repair of the institutions established, establish work shops for this purpose if required and manufacture or purchase the machinery and equipment required for them from domestic or foreign markets, To make useful the excess capacity of the established institutions and present material, machinery and equipment, To monitor, asset the world grain production activities and prices, make every kind of notification related to the activity matters To establish firms and cooperatives for every kind of purchase, selling, transportation, production, storage and protection works as to be based on the related activity matters either in the country or abroad and join in the partnerships established for this purpose.

**BOX 6. LICENCED STORING ACTIVITY**

Licensed storing activity has taken a place in trade system of almost all developed countries especially in USA. In this system, product stock markets, which are conducting spot procedures, turn into future markets. Because products aren't used as guarantee means in Turkey, products are sold at the term when the prices are low and supply is intensive. The mentioned situation leads to producer losses. Besides these factors, insufficiency in laboratories which check quality standarts and in the mentioned standarts of supplied products affects prices of the products too.

In Turkey, licenced storing system is realized with the help of Industry and Trade Ministry coordination.

Licensed storing law for agricultural products, published in official journal, has been in force since 17 February 2005. First and second legislations related to implementation of licensed storing system completed on 2 August 2006. Aim of this law is determining the basis and rules which are related to the establishment, operation and control of licenced storing system to make the trade of agricultural products easier, to establish a common system for storing, to provide the security and quality protection of the owners' products, to provide the determination of product degree and class by competent authorities, to guarantee the acceptance of agricultural products by licenced storing place owners without any discrimination among people, to prepare product bill which represents ownership of the product and provides sales, financing and delivery of the product, to improve trade of agricultural products which have determined standarts.

There is a grain, leguminosae and oilseeds licenced storage regulation aiming to make the trade of these products easier, to establish a common system for storing of the products, to provide the security and quality protection of the owners' products, to guarantee the acceptance of these agricultural products by licenced storing place owners without any discrimination among people, to prepare a product bill which represents ownership of the products and provides sales, delivery of the product and can be given as an assurance, to organize the rules, related to the establishment, operation and control of licenced storing places of grain, leguminosae and oil seeds which have determined standards.

**BOX 7. SUMMARY OF E.U GRAIN POLICIES**

The EU agricultural budget (FEOGA) finances intervention purchases of the member countries. The EU intervention prices used to be (much) higher than world prices and excess supply was exported with the help of export subsidies. The EU was forced to reform this system following the WTO Uruguay Round. In the 1994 reform of the Common Agricultural Policy (CAP) the intervention prices were decreased gradually while the income loss of the producers was compensated by direct payments.

Intervention purchases, storage, external and internal sales are conducted by EU paying agencies. These agencies buy wheat, durum wheat, barley, maize, sorghum that is produced in the EU and meet indicated quality and quantity conditions. Purchases are based on the intervention prices.

Because there are high quality private storage facilities in the EU, intervention agencies prefer to use private warehouses. The costs related to loading, quality control and unloading are paid by FEOGA. The warehouses are continuously checked by the intervention agencies. EU regulations define intervention period, operation of intervention centres, the products included in intervention operations, minimum quality and quantity requirements, price scales, rules to be implemented for storage and selling of the intervention stocks. Grain intervention purchases occur in these periods: 1 August – 30 April (for Italy, Spain, Greece and Portugal), 1 December – 30 June (for Sweden) and 1 November – 31 May for the other member states. Paddy intervention purchases are from 1 April – 31 July.

**2. COMPETITION ANALYSIS****2.1. Competition in holding scale****2.1.1. Planted Area**

Turkey has reached nearly the limit in utilising its available arable land. On the one hand, it is difficult to increase the size of wheat and barley area, since it has already extended to marginal areas. On the other hand, the maize and rice area can only be increased when conditions for irrigation are favourable and the area is extended at the cost of alternative crops.

**2.1.2. Production and Yield Comparison**

Although Turkey has been seen self-sufficient in wheat and barley, it has not produced enough to reach self-sufficiency for maize and rice. Especially for rice, Turkey continues to

be dependent on imports. Premium and certificated seed supports have increased maize production and supported the efforts of providing self-sufficiency in recent years.

Table 21. Cereal Self Sufficiency (%) (2002/03)

	<b>Total</b>	<b>Wheat</b>	<b>Corn (grain)</b>	<b>Barley</b>
EU-25	107	109	100	113
EU-15	108	109	95.947	115
Belgium	47	51	30	50
Romania	124*	143*	114*	167*
Bulgaria	135	140	100	186
Czech Republic	106	108	103*	161*
Denmark	105*	106*	0	107*
Germany	129*	148*	80*	128*
Estonia	91*	86*	0	105*
Greece	72*	71*	79*	41*
Spain	72	48	57	93
France	213*	215*	223*	266*
Italy	87*	80*	96	50*
Latvia	107*	127*	0	94*
Lithuania	126*	156*	6*	119*
Luxembourg	94	104*	27*	92*
Hungary	211*	250*	210*	156*
Malta	0	0	0	0
Netherlands	22*	29*	9*	33*
Ireland	83*	73*	45*	106*
Austria	104*	149*	86*	98*
Poland	113*	119*	103*	103*
Portugal	27*	15*	38*	7*
Slovenia	58	68	63	34
Slovakia	126	109	145*	127*
Finland	116	99*	0	105*
Sweden	127*	122*	0	149*
United Kingdom	106*	111*	0	126*
Turkey (2002–03)	105	116	61	104
Turkey (2005–06)	109	114	113	101

Source: Eurostat, AERI Reports

\*: 2004 Data

Average wheat and barley yields in Turkey are half as low as those of the EU (see table 22 and 23).

Table 22. Wheat Production Area, Yield and Production (2006)

	Area ( 000 Ha)	Yield (tonne/ha)	Production (000ton)
EU- 25	21.859	5.381	117.62
EU -15	16.784	5.932	995.67
Belgium	210	8.173	1.719
Czech Republic	781	4.486	3.506
Denmark	686	6.996	4.801
Germany	3.114	7.200	22.428
Estonia	90	2.418	220
Greece	610	2.262	138
Spain	1.958	2.847	5.576
France	5.252	6.745	35.431
Ireland	83	9.249	767
Italy	1.925	3.682	7.091
Latvia	214	2.796	598
Lithuania	344	2.355	809
Luxembourg	13	5.969	76
Hungary	1.078	4.060	4.379
Netherlands	141	8.548	1.207
Austria	284	4.906	1.396
Poland	2.176	3.244	7.059
Portugal	111	2.326	260
Slovenia	32	4.191	134
Slovakia	351	3.826	1.342
Finland	192	3.555	684
Sweden	366	5.462	2.001
United Kingdom	1.835	8.036	1.475
Turkey (2005)	9.250	2.324	21.500
Turkey (2006)	8.490	2.356	20.010

Source: Eurostat, TURKSTAT

The yields of wheat and barley production are lower in Turkey compared to the levels reached in almost all EU countries. Some of the main producers in the EU, such as France, Germany and England have even three or four times higher yields than Turkey (see table 22 and 23). However, yield is not the only indicator for competitiveness; it is also important to consider the costs of production (see further section 2.1.4). If Turkish farmers would be able to increase the efficiency of their input use (leading to higher production per hectare, while using the same amount of inputs) or to use cheaper inputs and/or to receive higher prices for their produce, this would be beneficial to their gross margin of production and their competitive position.



Table 23. Barley Production Area, Yield and Production (2006)

	Area ( 000 Ha)	Yield (tonne/ha)	Production( 000ton)
EU -25	13.261	4.131	54.791
EU -15	10.285	4.525	46.543
Belgium	49	7.495	367
Czech Republic	528	3.593	1.897
Denmark	679	4.815	3.270
Germany	2.025	5.908	11.966
Estonia	142	2.130	303
Greece	75	2.500	187
Spain	3.233	2.573	8.318
France	1.670	6.229	10.404
Ireland	164	6.685	1.096
Italy	330	3.877	1.282
Latvia	152	2.021	307
Lithuania	382	1.942	742
Luxembourg	9	5.263	50
Hungary	293	3.682	1.081
Netherlands	45	6.028	269
Austria	206	4.427	914
Poland	1.221	2.589	3.161
Portugal	45	2.107	94
Slovenia	17	3.615	62
Slovakia	185	3.465	642
Finland	564	3.494	1.972
Sweden	307	3.6	1.112
United Kingdom	882	5.939	5.239
Turkey (2005)	3.650	2.603	9.500
Turkey (2006)	3.650	2.616	9.551

Source: Eurostat ,TURKSTAT

Turkey's maize yield amounted to 7 tonnes per hectare in 2005. This figure has approached European Union's average maize yield which was 8.4 ton per hectare in 2004 (see table 24).

Table 24. Corn Production Area, Yield and Production (2006)

	Area( 000 ha)	Yield (tonne/ha)	Production(000ton)
EU- 25	5.708	8.414*	50.984*
EU -15	3.891	8.954*	37.855*
Belgium	56	10.193	576
Czech Republic	90	6.753	606
Germany	401	8.031	3.220
Greece	190	9.000	1.710
Spain	354	9.787	3.461
France	1.503	8.553	12.853
Italy	1.108	8.728	9.671
Lithuania	2	2.350	5
Luxembourg	0.288	6.510	2
Hungary	1.229	6.867	8.441
Netherlands	20	12.200*	253*
Austria	159	9.237	1.472
Poland	303	4.161	1.261
Portugal	100	5.371	536
Slovenia	40	6.930	276
Slovakia	153	5.469	838
Turkey (2005)	600	7.000	4.200
Turkey (2006)	536	7.110	3.811

Source: Eurostat ,TURKSTAT

\*: 2005 data

Looking at production area and yields, it is expected that wheat and barley areas and yields can be increased somewhat more as compared to the present situation. Also it seems feasible to increase maize areas and also maize yields, leading to an increase in production volume. Current maize yield is nearly equal to that of the EU at those regions in the country where the crop is produced intensively. On the one hand, the European Union, not permitting genetically modified import, will inhibit maize imports into Turkey from USA and Argentina and on the other hand, maize import from USA, financed with credit will be ended. At the end of these events, there will be higher costs in feed and poultry sectors.

Turkey's rice production does not satisfy domestic consumption; consumption needs are met through imports. Within the EU Spain, Greece and France produce rice where Spain is the largest producer with 746,000 tonnes. Turkey's paddy yield was 7.0 t/ha in 2006 whereas EU's average yield was 6.8 t/ha (see table 25).

**Table 25.** Rice Production Area , Yield and Production (2006)

	Area ( 000 ha)	Yield (tonne/ha)*	Production(000ton)
EU- 25	401	6.840	2.745
EU -15	399	6.858	2.736
Greece	23	7.870	181
Spain	106	7.012	746
France	17	5.476	95
Italy	228	6.855	1.564
Hungary	2	3.927	10
Portugal	24	6.225	150
Turkey (2005)	85	7.058	360
Turkey (2006)	99	7.030	696

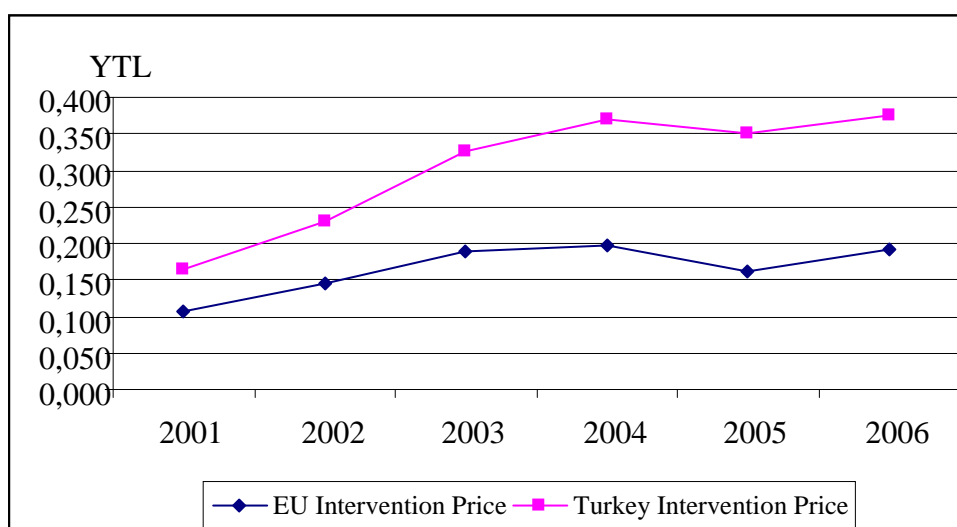
\* Paddy Yield

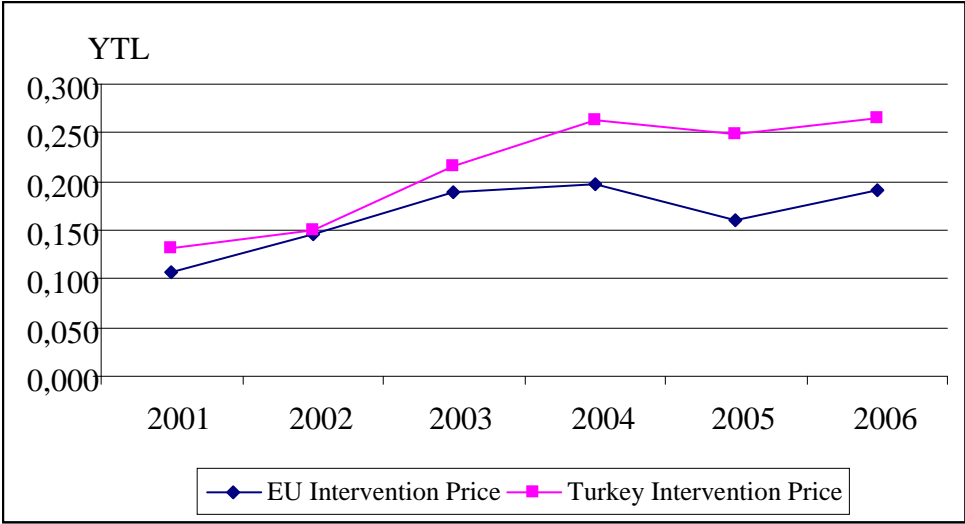
Source: Eurostat, TURKSTAT

Although the difference between Turkey's and EU's wheat, barley and maize yields is related to ecological and climate conditions, it is worrisome that Turkey's average yield for these crops is also under average world yields. Although among the grains paddy is in the most advantageous situation in terms of yields, production area and amount are still inadequate. Paddy law, aiming to organize water and to prevent malaria, restricts paddy planting area.

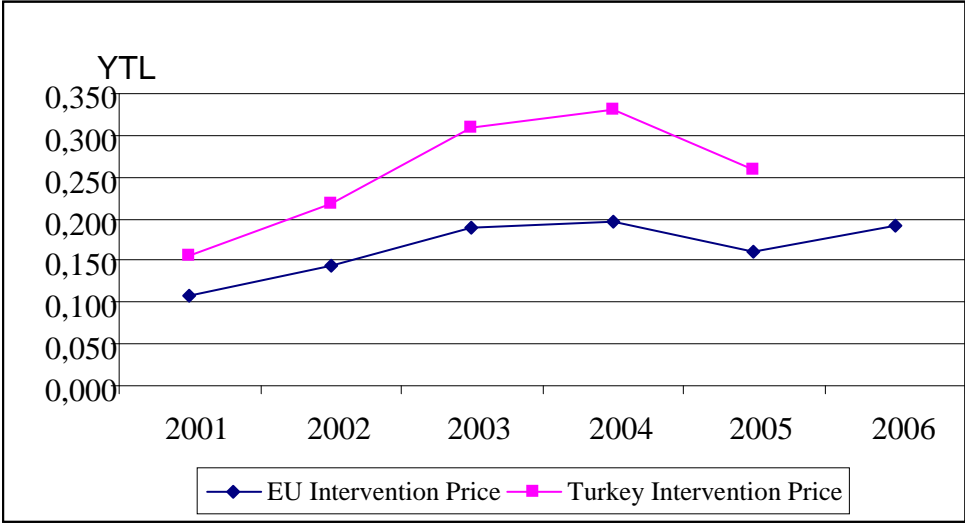
### 2.1.3 Grain Prices

In Turkey grain prices are higher than intervention prices in the EU. An overview of developments in wheat prices is given in Graph 2. Except for the 2001 – 2002 crisis, in Turkey the wheat price was generally about two times higher than the EU price.

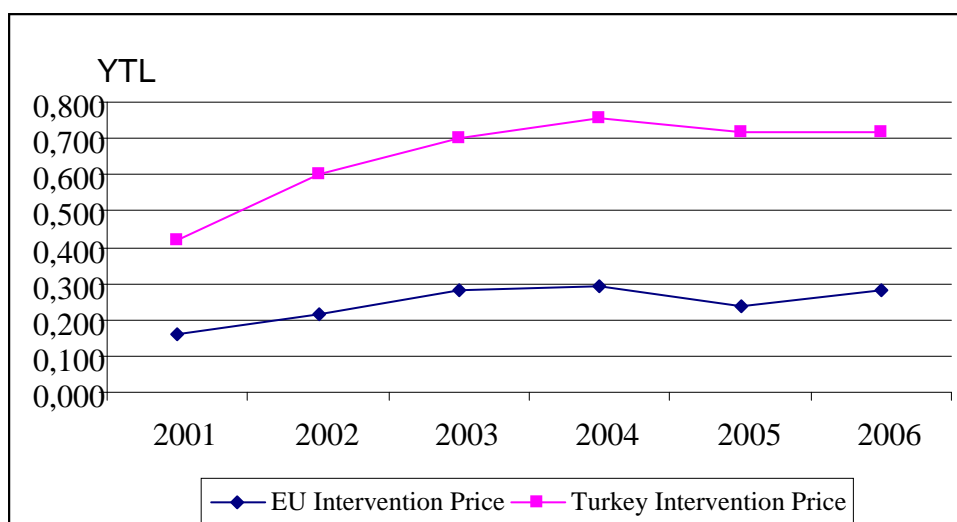
**Graphic 2:** Turkey and EU Wheat Prices (YTL/Kg)



Graphic 3: Turkey and EU Barley Prices (YTL/Kg)



Graphic 4: Turkey and EU Maize Prices (YTL/Kg)



Graphic 5: Turkey and EU Paddy Rice Prices (YTL/Kg)

#### 2.1.4. Gross Margins and Costs

Profit is a major indicator of the success and competitiveness of the grain sector. There are different grain producing regions in Turkey; each has different production costs. In this study the national average is taken for production costs and gross margins are calculated.

As can be seen in Table 26, in Turkey paddy rice has the highest gross margin per hectare, followed by maize.

Table 26. Gross Margins (YTL/ha) (2005)

	Wheat	Maize	Barley	Rice
Gross Production Value	1.117	2.620	825	5.505
Variable Costs	804	1.730	715	2.960
Gross Margin	313	890	110	2.545

Source: TEAE Calculations Using Data of Ministry of Agriculture and Rural Affairs

Additionally, a comparison is made in terms of the average costs and gross margins of Turkish wheat production with the figures for Romania and England.

Table 27. Gross Margin And Cost Comparison For Wheat (2003)

	Romania	Turkey	UK
Gross Production Value(\$/ha)	280	772	705
Support Amount (\$)	31	48	305
Yield (tonne/ha)	3,5	2,5	7,5
<b>Total Income (\$/ha)</b>	311	820	1,010
Seed	43	58	75
Fertilizer	58	80	130
Pesticide	35	20	120
Other	-	237	20
<b>Total Variable Costs (\$/ha)</b>	136	395	335
<b>Gross Margin (\$/ha)</b>	175	425	665
Variable Cost per Unit (\$/tonne)	39	158	44
Field Rent		68	
General Cost		14	
Amortization, Insurance		3	
<b>Fixed Cost (\$/ha)</b>	98	85	250
<b>Total Cost (\$/ha)</b>	234	480	584
<b>Total Cost Per Unit (\$/tonne)</b>	67	192	78
<b>Net Margin(\$/ha)</b>	77	340	415

Source: The Romanian Agrifood Chain: On the Road to Accession, SGB, TEAE Calculations

In Turkey, the average gross margin for wheat is 425\$ per hectare. Yields are nearly 2.5 tonnes/ha whereas the variable costs amount to 158\$ per ton. In Romania variable cost per hectare for wheat is 39\$ per tonne while in England it is 44\$. Looking at the net margin for wheat production, it appears that Turkey outperforms Romania (340\$/ha versus 77\$). However, net margins in England are substantially higher (415 \$ per hectare). Also the total cost per tonne is relatively high in Turkey when compared to Romania and England (192\$/tonne versus 67\$ and 78\$ respectively).

It can be concluded that profitability of wheat production in Turkey is relatively low, mainly due to the high cost of production, which is negatively influencing the competitiveness of the sector.

## 2.2. Processing Industry Performance

All grain processors in Turkey belong to the private sector. In general, the factories are small or medium in size. It is difficult to obtain detailed information about their functioning and competitiveness. Data on capacity utilization are available (See table 28); these provide an idea about the profitability of the industry. In 2005 the capacity utilisation rate of the wheat flour industry was 36%. This figure was 50% for the pasta industry, 58% for biscuit industry and 44% for starch-based sweetener industry. Capacity utilization rate for the Fodder industry was nearly 45%.

Main reasons of the low rates in capacity utilisation are the high price of raw materials, irrational investment decisions and the national economic crisis. Many companies operating in the grain processing industry, especially in the flour industry, work inefficiently and are not profitable.

Table 28. Capacity Utilization (2005)

	%
Wheat flour	36
Pasta	50
Biscuits	58
Starch	61
Starch Based Sweetener	44
Fodder Industry	45

Source : SPO

Table 29 shows that the production of processed grain commodities has been increasing year by year.

Table 29. Manufacturing of Cereal Products (000 Ton)

	1999	2000	2001	2002	2003	2004	2005
Flour	10.450	10.710	10.670	10.622	11.450	11.800	12.500
Pasta	372	373	383	422	438	512	566
Biscuits etc.	425	420	456	475	485	550	580
Mixed Feed	6.046	6.662	5.178	5.176	5.853	6.905	6.834
Beer (million liter)	715	763	744	754	801	877	918
Starch	58	64	62	66	75	91	98

Source: TURKSTAT, Manufacturing Industry Statistics

Additionally, exports of grain products are presented in Table 30.

Table 30. Export of Cereal Products (000 Ton)

	Flour		Pasta	
	Quantity(ton)	Value(000 \$)	Quantity(ton)	Value (000 \$)
1996	551.355	166.808	108.894	58.106
1997	844.110	253.628	135.989	70.129
1998	345.704	90.338	90.949	45.199
1999	219.801	40.374	23.987	9.984
2000	354.858	64.142	25.515	9.683
2001	171.841	30.887	34.284	11.586
2002	230.317	42.342	49.372	16.752
2003	593.264	111.462	69.071	26.848
2004	786.054	197.487	125.999	50.263
2005	1.958.534	421.197	164.256	65.450
2006	815.000	163.000	69.000	32.000

Source: IGEME

The table shows that Turkey's pasta and wheat flour exports have been increasing continuously. The main factor determining competitiveness is the price level of the raw materials. When the industry would be able to source grain at a lower price, it would be able to better utilize its processing capacity and hence enhance its competitive position.

Table 31. Share of Turkey Grain Products in World Wheat Flour and Pasta Exports

	Wheat Flour			Pasta		
	Turkey	Wheat	(1)/(2)	Turkey	Wheat	(1)/(2)
	1000 ton	1000 ton		1000 ton	1000 ton	
	(1)	(2)		(1)	(2)	
2002	230	8.726	2.63580	49	2216	2.211191
2003	593	8.828	6.71726	69	2268	3.042328
2004	786	7.464	10.53055	126	2367	5.323194

Source: FAO

World and Turkey total amount of wheat flour and pasta exports are presented in Table 31. Turkey wheat flour and pasta exports have been increasing over the last years.



### 3. SWOT ANALYSIS

#### Strengths:

- Abundant arable area available for cropping
- Large processing capacity installed for cereals
- Farmers benefit from a wide range of market outlets

#### Weaknesses:

- The parcel size of the cereal farms is generally small and they are unevenly distributed
- Ineffective laws which should prevent further fragmentation of production
- Limited use of certified seeds
- Farmers' technical and business skills
- Farmers' financial situation
- Malfunctioning market channels and limited available market infrastructure. such as transport and storage
- Farmers, traders and processors use little risk management tools
- Reluctance of sectoral actors and producers to cooperate for development of their market power and bargaining power to purchase inputs
- Expensive inputs
- Unfair competition created by unregistered processors and producers
- Lack of training activities and little market information
- Low capacity usage (capacity surplus) in processing
- Insufficient procurement of raw material
- Limited storage facilities
- Low competitiveness because of high cost

#### Opportunities:

- Potential for improving cereal yield and quality (by using certificated seed)
- Improvement in the warehouse(wholesale trade) receipt system (licensed storage system)
- Accession into EU
- Organic agriculture
- Good strategic position in the global market (accessible markets in the East, Middle East and in the West)

- Legislation to prevent further fragmentation of production

Threats:

- Strong and increasing international competition when the sector fails to improve competitiveness
- Increasing cost of inputs (fertilizer, diesels and agro-chemicals) and dependence on imports from abroad
- Climate change
- Accession into EU

#### **4. POLICY RECOMMENDATIONS**

Below one finds a list of the main policy recommendations derived from the analysis made in the previous chapters.

##### **1. Tackle the constraint of small-sized and divided agricultural lands**

The inheritance law aggravates the division of agricultural lands resulting in farms becoming too small to be profitable. This situation prevents efficient usage of resources and increases costs.

A new law aiming to implement practices to improve soil protection and increase area usage has been in force since 09.02.2007 following official newspaper publication. Effective implementation of the mentioned law could provide part of the solution to problems related to divided and small sized agricultural lands.

In addition, it is necessary to encourage and to accelerate the integration activity of agricultural areas.

##### **2. Tackle inadequate grain yield and quality following insufficient use of certified high-quality seeds**

Seed production research studies should respond to the needs of the producers and the sector as a whole. Government should support such activities. Since governmental resources to produce certified seed are insufficient, private sector must be encouraged to produce such seeds. TIGEM must be a guide for private sector in producing certified seed. The usage of certificated seed by farmers must be encouraged for instance through training and extension activities. Premium measures should be linked to product quality. Seed production under contract should be promoted.

##### **3. Improving the licensed storage system**

Although licensed storing law is operational, aiming at stabilizing market prices, the construction of additional storing capacity is required. The government must support the

operation of the system since small farmers and traders do not have the financial means to finance it.

#### **4. Tackle low yield and quality**

It is recommended to implement a regional approach to improve grain yield and quality. Looking at competitiveness, especially the production regions which have the ability to compete with the EU are crucial. The support system should have a differentiated structure, responding to different needs in the production regions. Contractual production must be supported.

#### **5. Improve information flow and training**

Farmer training and extension must be strengthened so that research results can be implemented. Training materials must be provided to the producers.

#### **6. Enhance agricultural financing**

Land title and cadastre processes must be revised in order to make the land ownership situation clear. Currently, this lack of clarity prevents farmers from getting credit.

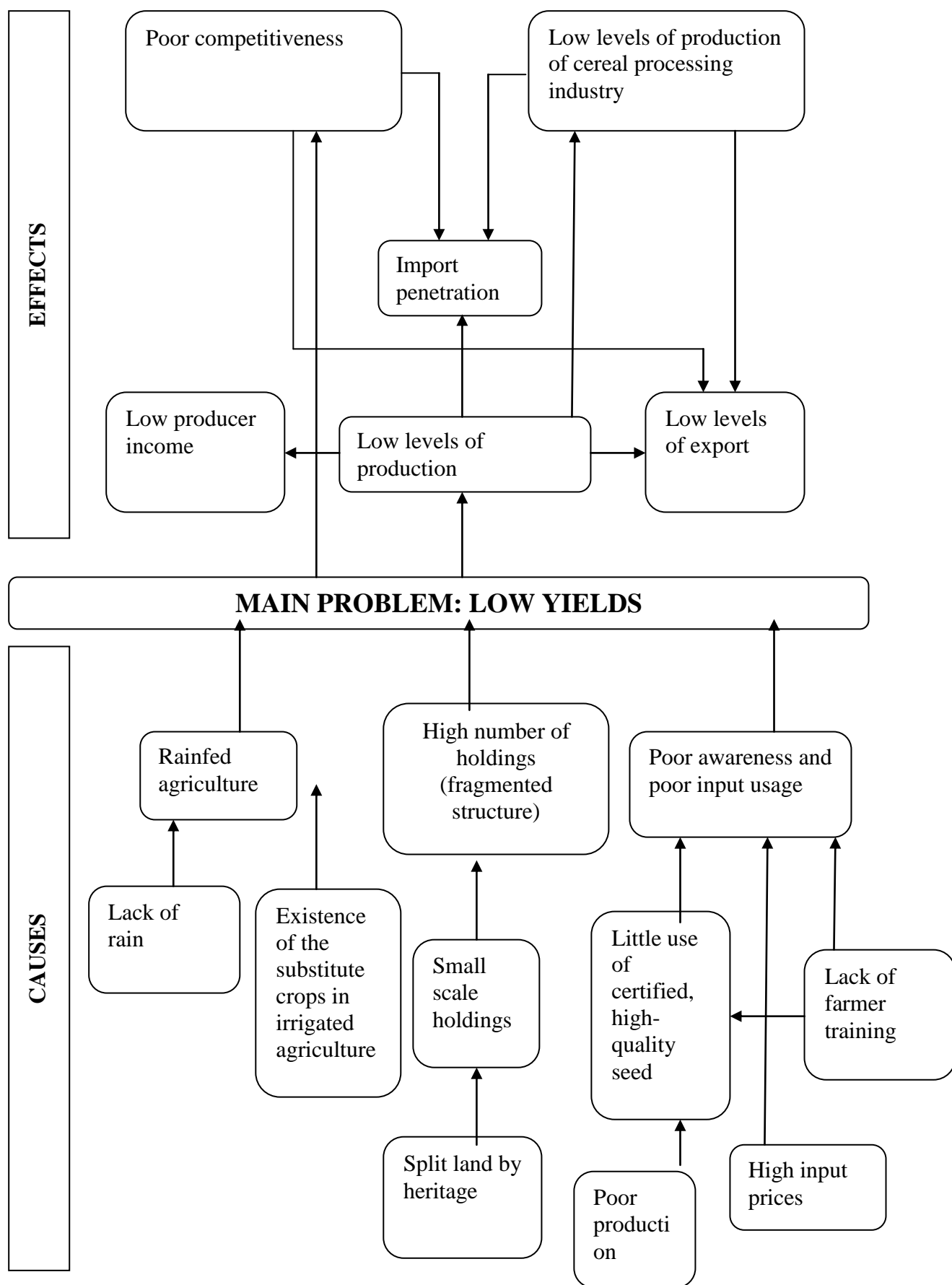
#### **7. Improve market structure**

Although TMO is an alternative outlet for producers at the time of harvest, it is recommended that the establishment of a futures markets is promoted to provide farmers with more options. In addition, it is necessary to increase the number of wholesale markets with high-quality infrastructure operating in a system of quality standards.

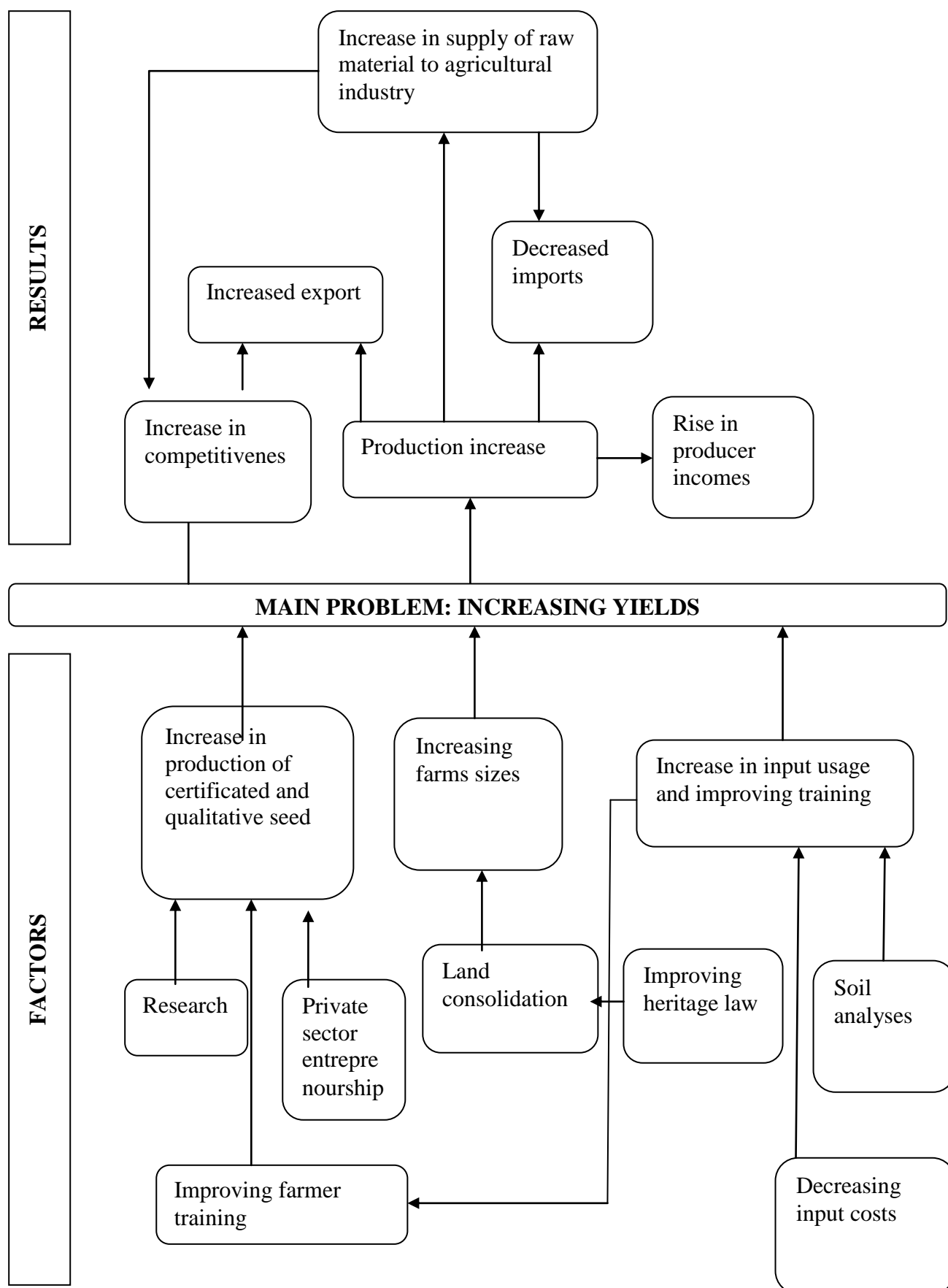
#### **8. Promote fair market competition**

Unregistered enterprises, which do not pay taxes form an unfair competition to registered enterprises. Operating under a lower cost structure such informal companies could possibly obtain a high market share and higher profit margins. Some control and education measures are required to prevent this situation.

**Workshop 1.Cereal Problem Tree**



**WORKSHOP 1. Cereal Target Tree**



**REFERENCES**

Dönmez, D. 2006. Rice Situation and Outlook:2006/2007, Agriculture and Rural Affairs Ministry Agricultural Economics Research Institute, Publication No: 148,Ankara.

DPT, 2006. 9.Development Plan (2007–2013) Food Special Committe Report.

Ege, H., Eken,H.,Çakaryıldırım,N. 2006. Barley Situation and Outlook:2006/2007, Agriculture and Rural Affairs Ministry Agricultural Economics Research Institute Publication No:147, Ankara.

MAFWE, 2003.The Romanian Agrifood Chain:On the Road to Accession, Ministry of Agriculture, Forests, Water and Environment, Bucharest.

Agriculture and Rural Affairs Ministry Agricultural Economics Research Institute, Wheat Situation and Outlook Reports, Various Years.

Agriculture and Rural Affairs Ministry Agricultural Economics Research Institute, Feed Grains Situation and Outlook Reports, Various Years.

Agriculture and Rural Affairs Ministry, 2006.Agriculture in Turkey, Ankara.

Soil Products Office,2006 Yılı Cereals Report

State Statistics Institute , Agricultural Structure and Production, Various Years, Ankara.

State Statistics Institute,.,Agricultural statistics Summary (1986–2005), Ankara.

<http://www.dpt.gov.tr>, Reaching Date:05.02.2007

<http://www.tmo.gov.tr>, Reaching Date:07.02.2007

<http://www.igeme.gov.tr>, Reaching Date:11.02.2007

<http://www.faostat.fao.org> , Reaching Date:21.02.2007

<http://www.epp.eurostat.ec.europa.eu> , Reaching Date:25:02.2007

## Turkish Poultry Meat Sector Analysis

Halit ÇINAR Alkan DEMİR Şevket KALANLAR  
Berrin TAŞKAYA Siemen van BERKUM

### 1. INTRODUCTION

#### *Background and approach of the study*

The aim of this chapter is to describe and estimate the state and performance of the poultry meat sector in Turkey. The report aims to judge the competitiveness of the Turkish poultry meat sector, to identify key constraints to competitiveness and to develop policy interventions to improve the competitive position of the sector.

The common methodology established is based upon internationally accepted definitions of competitiveness, which focus on the ability of individual industries to “profitably maintain or increase market share” in either domestic or international export markets. Structure, conduct, and performance concepts are combined with resource analyses in judging the competitiveness of the Turkish poultry meat chain, to identify key constraints to competitiveness and to develop policy interventions to improve competitiveness. The study considers the entire poultry meat chain including farmers and meat processing companies, as well as their linkages to marketing and retailing activities.

This sector report covers the following issues:

- a description of the sub-sector based upon secondary data covering among others trends in production, consumption and trade, yields, prices, concentration of production, capacity utilization, and a description of the linkages within the food chain;
- primary data collection using case-studies to illustrate key activities in the poultry meat sector and identify lessons for the sector’s development;
- an identification of key-constraints limiting the competitiveness and development of the sector;
- and an identification of policy options.



The structure of this chapter is as follows. In section 2, an overview of the present situation and conditions in poultry meat production and processing in Turkey is presented. Section 3 further elaborates on the issue by evaluating factors, which influence the competitiveness and efficiency of the poultry meat chain. Based on these analyses, the sector's Strengths and Weaknesses, Opportunities and Threats are identified in section 4. Such a SWOT analysis gives the possibility to define prerequisites and directions for the sector's future development. The recognition of key constraints leads to a series of ideas for policies that may address the obstacles to further development and help reduce the inefficiencies identified. Section 5 drafts policy options in as much detail as is possible at this stage.

## **2. OVERVIEW of the TURKISH POLULTRY MEAT SECTOR**

### **2.1. Description of the Sector**

The poultry meat sector consists of production on farm level and processing industry of broiler, turkey, duck and goose ready for consumption. In Turkey, 93% of poultry meat production is made by integrations (vertically integrated poultry meat producers, including farms and processing units) today. The poultry meat sector started to produce in industrial means during the 1970s. Especially after investments on infrastructure in the 1980s the sector could respond to increasing demand for animal products because of population and income increases. Furthermore, poultry meat is considered healthier than beef meat and red meat prices are higher than for poultry meat, two additional reasons why demand for poultry meat increased significantly in last decades. Yet, per capita consumption in Turkey is still much below the average consumption levels in many European Union and other developed countries.

### **2.2. Production Value**

Poultry meat production accounted for 3.7% of the Gross Agricultural Output in 2005 (see table 1). During the last decade, poultry meat production was the fastest growing sub-sector in livestock production with its average 12% growth rate per year (see table 2). In table 1 below this shows as the share of poultry production in total livestock production increased from 10% in 1996 to 15% in 2005. Poultry meat production is mainly chicken meat (see also table 2).

Table 1. Gross Agricultural Output (GAO) value and share of poultry meat

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total GAO (billion YTL)	2.7	4.78	9.7	13.3	20.1	26.1	42.2	55.1	61.1	67.4
Crop production (billion YTL)	2.1	3.6	7.3	9.7	14.9	20.0	31.8	40.7	45.7	51.0
Livestock production value (billion YTL)	0.6	1.2	2.5	3.7	5.2	6.1	10.5	14.4	15.4	16.5
Poultry production value (million YTL)	63	138	271	437	658	661	1.492	2.077	2.255	2.481
Chicken meat production value (million YTL)	63	137	270	426	632	638	1.402	1.913	2.082	2.277
Share of poultry meat in total livestock production value (%)	10.1	11.5	11.0	11.9	12.8	10.9	14.3	14.4	14.6	15.0
Share of poultry meat in GAO (%)	2.3	2.9	2.8	3.3	3.3	2.5	3.5	3.8	3.7	3.7

Source: TÜİK, Agricultural Structure (Production, Price, Value)

## 2.3 Production, consumption and trade

### 2.3.1. Production

The strong depreciation of the Turkish Lira in 2001 caused a significant decrease of 5% in production due to increased production costs of the sector which is heavily dependent on feed imports and because of decreased purchasing power of the consumer. Even there is an increasing trend in turkey production, duck and geese production decreased over time (see table 2). There are approximately 5.5 production cycles in Turkish broiler production each year, and on average 110 thousand animals produced each cycle.

Table 2: Turkish Poultry Meat Production (Tonnes Carcass Weight)

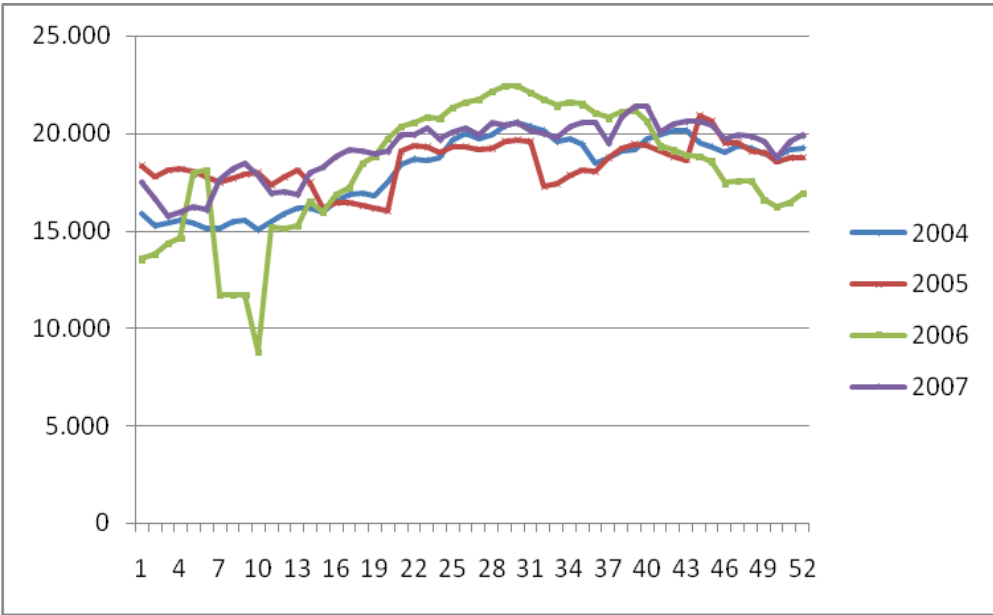
	Chicken Meat	Turkey Meat	Duck M.	Geese M.	Total
1995	282.038	-	-	-	282.038
1996	420.609	1.027	266	464	422.366
1997	471.415	376	40	97	471.928
1998	486.710	702	24	106	487.542
1999	596.880	12.744	5	24	609.653
2000	643.457	19.274	4	13	662.748
2001	614.745	15.125	5	13	629.888
2002	696.187	30.401	6	13	726.607
2003	872.419	32.801	10	21	905.251
2004	876.774	37.623	10	51	914.458
2005	936.697	42.709	2	5	979.413
2006*	945.779	45.750	-	-	1.031.779
2007*	997.000	33.000	-	-	1.085.000

Source: TÜİK

Avian Influenza (AI) is an animal disease in Turkey, carried by wild birds. Until the first AI plague in Turkey, that appeared especially in backyard poultry during the last months of 2005, it was a common and legal practice to slaughter the spent hens from layer flocks, and

subsequently to sell backyard poultry in open markets. This practice was left during AI struggle and it was decided to slaughter spent hens in separate slaughterhouses to process in the rendering plants and to ban the sale of backyard poultry in open markets.

Since foreign trade volumes are very small compared with internal consumption, production data is very similar with consumption data. During the summer season there is usually an increase in demand because of the grill season and tourism. That is why there is a huge difference in consumption levels between summer and winter seasons. The average capacity utilization in integrations remains 70% for that reason. On the other hand, because of AI plague started in the end of 2005 and lasted till the first quarter of 2006, production decreased and some integrations cut the production down, yet on a temporary basis. The production in early 2006 declined but generally the impact of the AI has been low, as production capacity recovered so that the total 2006 production reached a higher level than in 2005 (see figure 1).



Source : BESD-BİR

**Box 1. BROILER INTEGRATIONS**

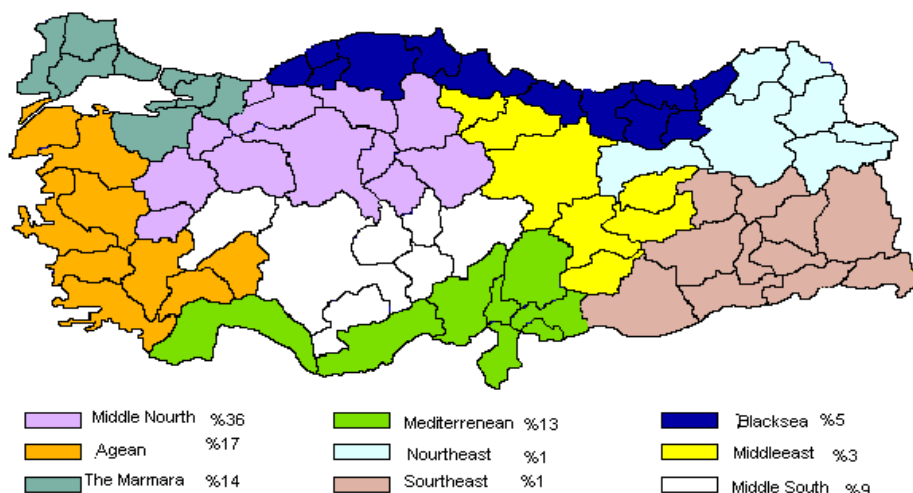
Turkish Broiler Integrations mostly completed their vertical integration. Most of the companies work with contracted farmers with the help of their own feed mills, parent stocks and hatcheries; distribute poultry meat with their own marketing network which they process in their own facilities. Live production is made with contracted farming. Integrations usually do not invest in poultry house installations, but request the contracted farmer to comply with some technical conditions. Integrations give veterinary services to the contracted farmers in charge. After supplying day old chicks and feed without any fee to the farmer according to the contract, integrations transport animals ready to slaughter which were collected by the farmer to slaughterhouse. Payments are made at the end of the cycle according to the contract for kg live weight. Prepayments are also made to the farmer during the production cycle if needed. Additionally premiums are paid to the farmer by the integration according to contract, for the good technical production parameters like mortality rate, feed conversion rate and slaughtering weight.

Turkish poultry meat production in 2005 was almost 1 million ton. This equals to 9% of EU-25 total production. Table 3 lists the major poultry producing countries in the EU. Including Turkey in this list would rank the country as number six .

Table 3. Total poultry meat production in EU-25 in 2005 (in 1,000 tonnes)

Country	Production
France	1,940
United Kingdom	1,606
Spain	1,302
Germany	1,196
Italy	1,092
Poland	972
Holland	565
Hungary	449
Belgium/Luxembourg	297
Portugal	286
Total	11,030

Figure 1. Geographical Distribution of Turkish Poultry Meat Production



Poultry production is concentrated in the Middle North, Agean, Marmara and the Mediterranean regions of Turkey. One of the most important reason for this is the short distance to big consumption centres. In these regions with dense population and higher income, markets are available which makes poultry production in these regions attractive. Also a developed tourism sector and good infrastructure (ports, roads) are reasons for poultry producers to choose these regions.

In the sector, there are approximately 12,650 broiler and 2,800 egg poultry houses. Over 500 thousand people (including producers, farmers, traders related with the sector, feed, medicine, related industry, transportation and marketing) are employed in the sector and around 2 million people (assuming that those 500 thousand people have families of 4 people) are making a living from this sector. Annual turnover of the sector is around 3 billion USD (BESD BIR website Sector report 2006). There are 21 members of BESD-BİR with their own slaughter houses.

**Box 2. ENVIRONMENT****Slaughterhouses**

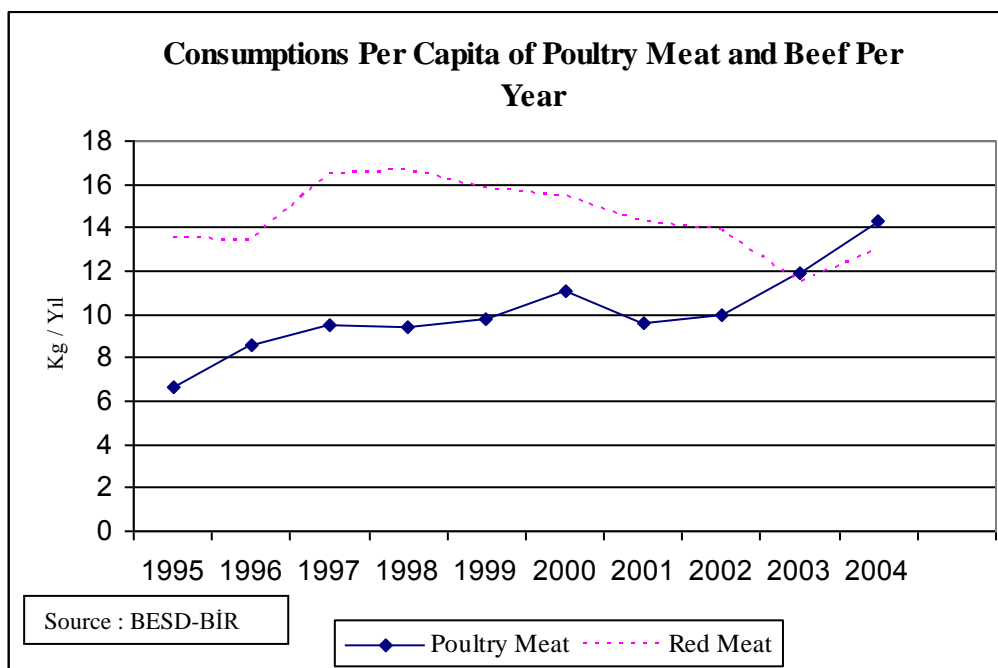
Environmental pollution risks are higher in regions which have intensive animal production because of waste of live production and slaughter. The Ministry of Agriculture and Rural Affairs/General Directorate of Protection and Control (MARA/KKGM) is responsible for the hygiene and environment policy with respect to the establishment and licensing of slaughterhouses. During the identification stage for the construction of a meat plant, an Environment Impact Assessment especially for the Class 1 meat plant (classification of the slaughter houses made according to slaughtering capacity but this also determines technical requirements asked for this class, like hygiene, etc.) has to be conducted. The MARA/KKGM will issue the operating license after final checks. Monitoring is ongoing during the operation mainly on water treatment (TKB-SGB, 2004). For public health and nature, it is needed to homogenize technical standards for slaughterhouses in terms of sanitary and environment issues.

**Poultry houses**

Another problem in regions where poultry production is conducted intensively, is disposal of manure. Because of environmental and health concerns over increasing nitrate concentrations in surface and groundwater in the EU, especially in intensively farmed agricultural areas, in 1991 the Council of Ministers adopted a Directive on the protection of waters against pollution caused by nitrates from agricultural resources. There are two important regulations in Turkey related to nitrate directive but for a total struggle against nitrate pollution, Turkey has to implement some measures about agricultural practices. One of them is the establishment of systems for manure management. Also land application systems have to be made by taking into account different climatic conditions and soil types. Monitoring systems which will include all the surface water, ground water and soil have to be established (GÜZELORDU, 2008).

### 2.3.2. Consumption

Population growth, income increases and poultry meat prices being lower than beef prices are all reasons why poultry meat consumption per capita increased strongly over the last decade to reach 14kg/capita in 2004.



The share of poultry meat consumption in total food expenses increased especially in the 1990s: in 1994 it accounted for only 1.9%, yet it increased to reach 3.5% in recent years. During the economic crisis in 2001 there was a decrease in purchasing power of the consumers. Poultry meat consumption didn't lose its share in total food expenses, but total poultry meat consumption decreased for the first time in several years.

In spite of the significant increase in poultry meat consumption per capita during the last decade, Turkish poultry meat consumption per capita is still lower than EU average and developed countries average. (See table 4). In the near future it is expected that the increasing trend in poultry meat consumption in Turkey will continue because of population growth and an increase in income levels.

Table 4: Poultry Meat Consumption per capita in Turkey and World 2006

Region	Consumption per cap. (kg/year)
World	11.7
USA	46.2
Russia	16.7
EU-27	15.8
Turkey	12.9

Source: USDA-FAS

Most of the poultry meat (83%) is consumed as chilled carcass and the rest is sold as frozen. 75% of the total sales is in the form of whole birds and the rest (25%) as cut pieces. 73% of the cut pieces sales is legs & breast, 11% as gizzard, 6% as wings and 4% as filet (Emine Çiğdem CİVANER, DTM). Turkey meat is traditionally consumed more in new years ewe in Turkey. People usually use broiler meat to as main part of their animal protein diet which is a result of high red meat prices. Since it is more expensive than red meat, duck and goose meat consumption is not common in urban areas. In rural areas they are consumed in evening meal during Ramadan as a special meal.

### **Box 3. ANIMAL BY-PRODUCTS**

In terms of struggle against BSE, a Directive related to Disposal of Animal By products Not Intended for Human Consumption was prepared and in addition to that a decision was taken to ban animal by-products as a feeding stuff for animals produced for human consumption by EU. This implementation had serious effects on both the environment and the economics of poultry meat production. It is estimated that the costs of disposal of animal byproducts to reach 3 billion € in EU ([europa.eu.int/comm/food/fs/bse/bse47\\_en.pdf](http://europa.eu.int/comm/food/fs/bse/bse47_en.pdf)). Since 1 million ton of poultry meat is produced in Turkey and 90% of this production is made by establishments which has rendering facilities, it is assumed that slaughter by-products like legs, feather and heads are equal to 140,000 ton a year. Rendering products generate an estimated 90 million dollars of added value annually in Turkey. Expected expenditures like DCP (Dicalciumphosphate), soy meal, methionine and lysine increase to 80 million dollars to replace poultry meal. This amount is equal to the cost of constructing new slaughterhouses for each integration. Since there is no system for incineration of biomass in Turkey, environmental and economic results of landfilling of by-products should be considered. For broiler producers, replacement of poultry meal (which is their own source) by imported feed raw matter would further decrease their competitiveness (ÇINAR, 2006).



### 2.3.3. Foreign Trade

Exports of poultry meat have never been a major part of the country's production (see table 5). In 2006, for instance, export was only 3.9% of national production. Yet, the trend in the export volume shows a gradual increase from 2002 onwards. Chicken foots, which is one of the most important export products, is mainly exported to China and Hong Kong. Hole bird, legs and liver is exported to Caucasian and Balkan countries. Only a small amount of poultry meat is imported from Germany and France as frozen birds.

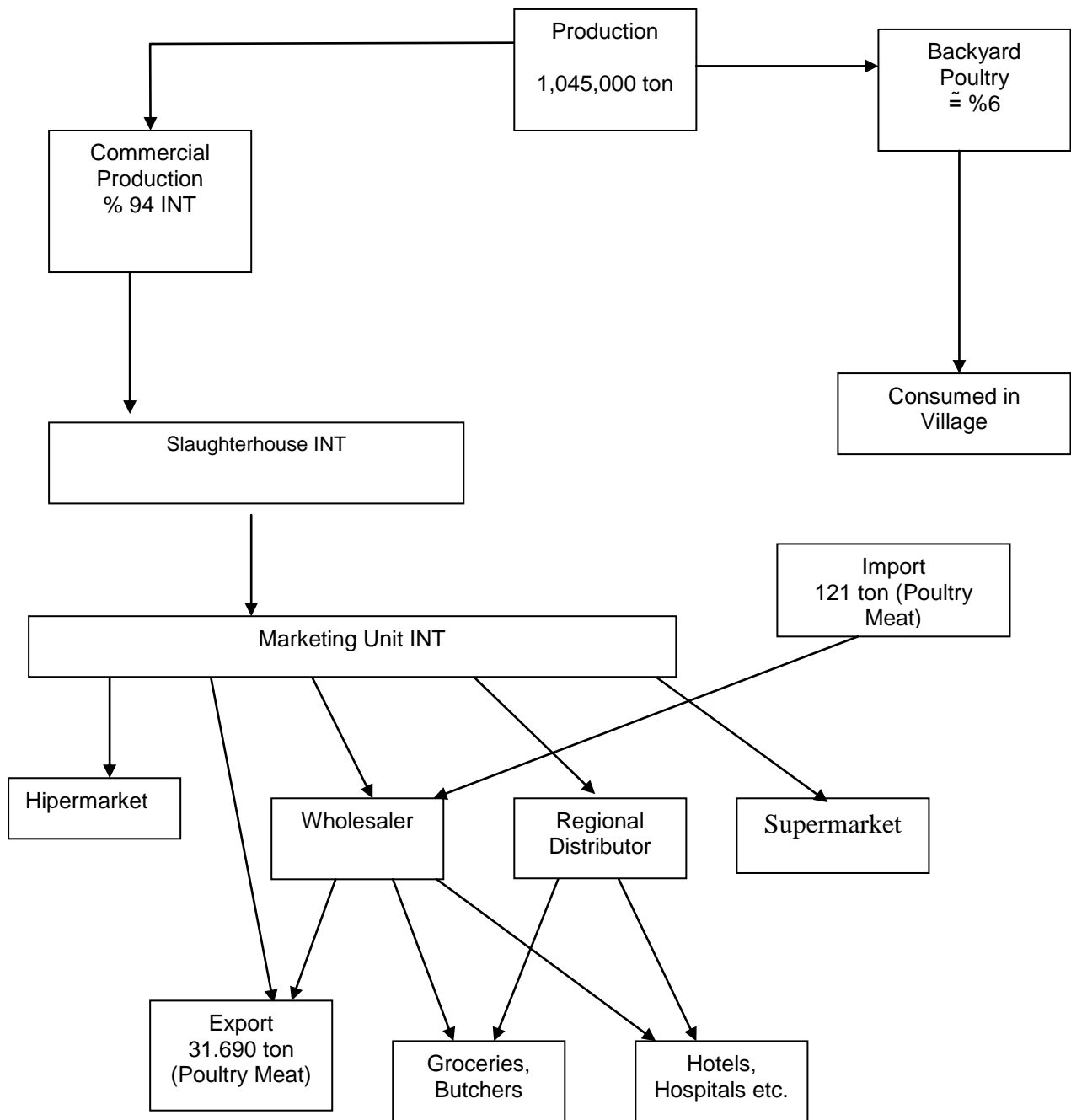
Table 5: Foreign Trade of Poultry Meat (Ton)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Export	5.557	9.648	8.842	3.43 1	2.03 3	13.47 1	7.94 6	10.65 4	14.80 8	29.29 2	39.81 0
Import	-	367	38	8	10	231	46	163	-	87	170

Source: BESD-BİR

The poultry meat sub-sector was inspected several times by EU authorities (the FVO) for export licence to the common market. FVO's last inspection was made in 8 slaughter houses of the integrations applied for an export licence in April 2007. Laboratory records on Avian Influenza and New Castle disease, efficiency of the inspections of MARA in slaughterhouses and efficiency of the laboratories about animal diseases and food inspections were approved. These Turkish companies expected to receive health certificates for export to the common market after FVO transmitted this report to DG SANCO. However there are gossips in the sector about political reasons of the EU to stop Turkish poultry products to enter the common market, like benchmarks on other issues between Turkey and EU. Turkey is surrounded by possible markets like Middle Eastern countries and Russia. But these countries also require EU health certificates as quality criteria. On the other hand it is not possible to compete with Brazilian products because of high Turkish poultry meat production costs and low export subsidies. Still, the sector thinks that building up a single export company would be helpful to make marketing researches, stop fluctuations in export and to build up new networks.

POULTRY MEAT MARKETING FLOW CHART 2005



**Box 4. BESDBİR**

White Meat Processors and Breeders Association is an organization representing 80% of Turkish poultry meat, hatching egg and chick production with its 41 members. Members are processing companies. The association collects data about the poultry meat sub-sector and prepares statistics and sector overview to the public and to people involved. Production projections are also prepared with this data in terms of stabilising poultry meat production. BESD-BİR which is a member of many Consultative Committees, works as a bridge between private sector and government by sharing its opinions in legislation studies about the sector. The association further conducts seminars, symposiums and conferences about poultry meat production and represents its members in the meetings related to sector. The association is in cooperation with “Healthy Chicken Board” aiming to increase the awareness of the consumer about food safety (BESDBİR website)

**2.4 Prices**

Poultry meat prices are determined according to free market rules in Turkey and there is no government intervention mechanism to support mechanism farmers’ prices. Accordingly, poultry meat price is determined due to feed raw material prices which is the most important component of production costs, and consumer demand which fluctuates with the seasons (SGB Kanatlı Raporu). However, since the consumer demand quickly responses to speculations about food safety and epidemic animal diseases, occasionally there are unexpected fluctuations in prices practiced.

Table 6: Retail Poultry Meat Prices (Euro/kg)

2000	1,09
2001	1,3
2002	1,5
2003	1,7
2004	1,8
2005	1,6

Source: TUIK

Every year approximately 2.12 million ton of broiler feed is produced in Turkey. In broiler feed formulations nearly 70-75% maize+soy mixture is used. As a common application in Turkey 5 raw material based formulations are used while 10 raw material based formulations

are used in rations. This means less flexibility for feed formulators to changing prices of feed raw materials in global market and higher dependency on import products. The poultry meat production sector needs 1.5 million ton soy/soybean meal production for feed, of which only 50 thousand ton can be produced locally. Also only 50% of the maize needed for feed production is supplied locally. Because of policies supporting maize production with protection on customs, import taxes are due in a range of 40 to 130% (in the harvest period in Turkey). Because of dependency on import for feed raw materials and support policies for local feed raw material producers, usually Turkish compound feed prices are higher than those in the EU.

Table 7 : Broiler Compound Feed Prices in Turkey (Euro/kg) Including VAT(%8)

2000	0.30
2001	0.27
2002	0.29
2003	0.29
2004	0.32
2005	0.33

Source : TEAE

### 3. COMPETITION ANALYSIS

#### 3.1 Competition of integrations

##### 3.1.1. Capacity

Poultry meat integrations produce approximately 1 million ton of poultry meat each year by using on average 70% capacity. Main reasons for using this relatively low capacity are seasonal fluctuation of demand and lack of opportunities for export during periods with low domestic demand.

Table 8: Shares Of Companies in Market (%)

	C.P. Standart	Banvit	Beypiliç	Er Piliç	Şen Piliç	Keskinoğlu	Pak Piliç	Şeker Piliç	Köy Tür Ege	Abaloğlu
2000	8.8	11.3	5.7	5.0	4.1	3.8	2.9	4.5	15.6	-
2001	10.6	12.5	8.4	6.5	5.6	4.6	3.7	5.1	13.5	0.7
2002	12.3	11.8	10.2	7.5	6.9	4.8	4.5	4.9	12.9	2.4
2003	11.6	11.2	9.7	8.5	7.5	5.0	5.1	4.7	5.2	2.7
2004	11.2	10.0	9.8	7.9	7.5	4.7	4.5	4.3	2.7	2.5
2005	10.9	9.9	10.0	8.9	8.7	5.5	4.1	5.5	2.8	
2006	10.0	10.3	10.1	9.1	8.2	5.7	3.5	5.9	2.5	3.2

Source: BESD-BİR

The Turkish poultry meat industry is rather concentrated. The top ten companies in the broiler meat production have over 68% share of the total market according to 2006 data (see table 8). This is close to the share these companies had in 2001, yet the distribution of the shares is different among the companies. Köy-Tür, a company with 15% market share in 2000, lost its position because of the crisis caused by the exchange rates in 2001. Several other companies though increased their market at the turn of 2001 and 2002 – partly taking over Köy-Tür's markets. Also some new companies started business in the sector. Fastest growing company in 2002 was CP Standart (Thailand based) the only foreign broiler integration in Turkey. However, considering the period up to 2006 companies like Er Piliç and Şen Piliç have shown the most significant increase in their market shares. According to today's conditions it is likely to have difficulties with big supermarket chains in trade since there is no dominant actor in the sector. According to contracts between poultry meat integrations and big retail chains, payments must be made in 90 days. However there are complaints in the sector that these big retail chains are using their market power to often exceed this deadline.

### **3.1.2. Production and Productivity Comparisons**

In this comparison Dutch figures are used against Turkish, because Netherlands is well known with its high technology and good technical field parameters in livestock production, and with closest prices to global market for feed raw materials, compared to other EU countries. That means, if Turkish producers can compete with Dutch producers, they will have chance in the global and the EU market.

If main technical performance parameters are compared, such as mortality rate, feed conversion rates and live weight at slaughter, Turkish poultry meat producers show better results than those in neighbouring countries such as Romania, Bulgaria and Iran. The production period, which is longer than in western countries, affects the feed conversion rate, but this loss can be compensated with a higher slaughtering weight. Improved performance could be gained by taking measures to reduce mortality rates.

An international comparison of production costs using the same calculation formula is presented in table 9-11. Most important factor affecting Turkish poultry meat production costs

is the feed costs, making up around 70% of production costs per kg of live weight. This percentage is 55% in the case of the Netherlands. Eventhough labour costs are much lower in Turkey than in the Netherlands, the numbers of animals per worker in relation to poultry house capacities is also lower. This results in labour cost per kg of live weight that are not that different comparing both countries. Higher interest rates is another factor that can affect production costs. Empty periods getting longer because of biosecurity issues, between production cycles decreases the investment efficiency for poultry houses.

Table 9. Main Performance Criteria 2004

	NL	TR
Production Period (Days)	42,2	47,0
Live Weight at Slaughter (gram)	2.120	2.350
Feed Conversion Rate	1,74	1,84
Animal Density (Animals / m2)	23,00	18,00
Mortality (%)	3.6%	5.2%

Table 10. Main Price Estimations ( 2004)

	NL	TR
Feed Price (euro /100 kg)	22.7	29.6
Day Old Chick (euro / chick)	0.24	0.27
Poultry House Investment (euro / m2)	139	70
Equipment Investment (euro / m2)	55	41
Number Of Animals Per Labour	75,000	30,000
Labour Cost (euro / hour)	19.71	5.00
Interest Rate (%)	4.2%	15.0%

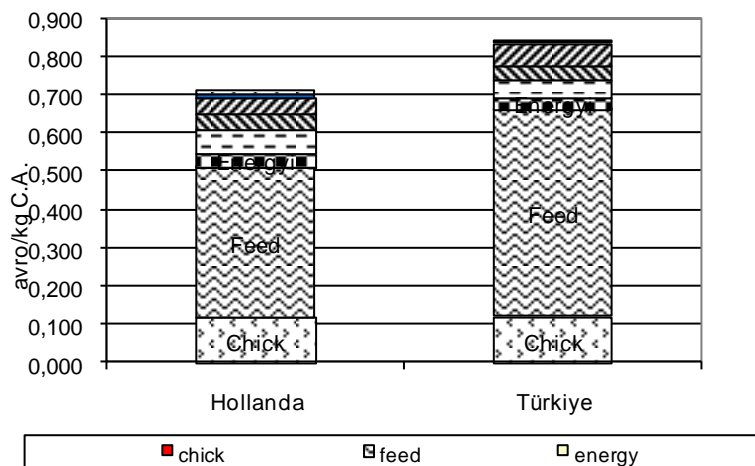
Table 11. Production costs per kg live weight (eurocent/kg)

	NL	TR
Chick	11.9	12.1
Feed	39.5	54.5
Energy	3.4	3.1
Other Variable Costs	6.2	4.5
Labor	4.3	3.5
Poultry House	4.0	6.1
General	0.8	0.5
Manure Disposal	1.1	0.0
TOTAL	71.4	84.4

Figure 5 illustrates the cost composition of poultry production in the two countries. It is clear that the feed raw materials are the most important part of production costs. This is affected importantly by the higher price paid in Turkey for compound feed than in the Netherlands. However, in case of producing for export, feed raw materials can be imported without paying

import tax according to re-export rules. If producers could use feed without paying taxes, calculations show that Turkish poultry meat production costs would be close to Dutch cost levels.

**Şekil 5. Poultry Meat Production Costs**



#### 4. SWOT ANALYSIS

##### Weak

- High feed cost as a result of high prices raw materials. Turkey's prices of corn are much higher than world market prices. Import tariffs are 130%
- Depended on foreign inputs (raw materials, breeding stock, vaccines)
- High capital costs
- Insufficient measures of bio security

##### Strength

- modern state of art (partly)
- wide range of products
- integrated structure with large scale integrator
- good performance / good technical efficiency.(compared to neighbour countries)
- Good organization system of integrations

##### Opportunity

- Export poultry products based on world market broiler feed prices (import tax)

- Expected further growing consumption of poultry meat per head as a result of higher income, low prices poultry meat, low energy meat, convenience products of poultrymeat, no religious constraints....
- Growth of modern retail sector
- Developing market in high value poultry products
- Young population (promises more consumption in future)
- Good infrastructure (roads, harbours ....)

### **Threats**

- AI outbreaks causing lower consumption in Turkey and closing borders for export
- Backyard poultry keeping in certain areas (diseases)
- Imports from low cost producers like Brazil and Thailand
- No access to EU market and no external trade changes
- Fragmented production with 50% by main 6 integrators
- High interest rate and unstable macroeconomic environment (exchange rates and inflation)
- Environment: lack of regulations for manure disposal
- Need to comply with EU regulations about animal by-products (increasing production costs)

## **5. POLICY RECOMMENDATIONS**

Turkish feed prices are usually higher than world market prices as a result of policies protecting feed raw materials (cereals) produced locally against foreign competition via import taxes, and dependency on import feed raw materials. Creation and adoption of new support policies, which will not affect local prices of feed raw materials in terms of increasing the prices of feed which represents 70% of total production costs would help the poultry meat sub-sector but also other livestock production to become more efficient and internationally competitive.

Parallel to tendencies in world food market, big retail chains have more influence in Turkey day by day. Although their positive effects on packaged, processed and semi-processed



products are well known, it is frequently pronounced that these chains with great economic power cause some difficulties for small producers with little economic power, in terms of timing of payments. Preparation of a legislation that would regulate trade between retail chains and producers, similar to legislations adopted in some Western countries should benefit the food producers in all sub-sectors.

Because of infrastructure advantages such as ports and roads, poultry meat production is mainly located in certain regions of Turkey. Although not a problem today, disposal of manure originated from poultry production can become a problem in future. The manure which is preferred to be used for spreading on crop and/or grassland, cannot be used in this way today since processing and transport costs are high. Producing new policies for manure disposal would benefit the sub-sector in future as production is expected to increase.

Although the general bio-security conditions of poultry houses in Turkey are currently sufficient, there is still need for improvement. Improvement of bio-security conditions in poultry houses is both possible by better technical conditions and training of poultry farmers. The supply of credit facilities with low(er) interest rates for bio-security improvements in poultry houses by presentation would encourage poultry farmers to invest in the solution of this problem. It is possible to improve the economic efficiency of poultry production; by decreasing mortality which is one of the most important production parameters, but also to increase the resistance of the sector to epidemic animal diseases, with training of poultry farmers as a second step after improvement of infrastructure.

Poultry meat producers which comply with EU quality and hygieny requirements, could not start to actively export to the EU eventhough their requests were approved after several inspections. A possible problem in the near future with respect to export to the EU is animal by-products. As a part of the measures to drive out BSE the EU has banned the usage of meat and bone meal in animal feeds. Poultry producers which are depended on import raw materials for feed production, are complaining that they would have serious economic losses if poultry meal is banned in feed, as it is their own by-product and considered as good feed raw material. Also, huge investments are needed for the disposal of by-products in compliance with EU legislation. Further research is needed and action plans should be drafted in this field to avoid possible problems in future.

**REFERENCES**

BESDBIR Sector report 2006, [www.besd-bir.org](http://www.besd-bir.org)

TURKSTAT, Agricultural Structure (Production, Price, Value), [www.tuik.gov.tr](http://www.tuik.gov.tr)

MARA, Tarım ve Köyişleri Bakanlığı Strateji Geliştirme Başkanlığı, Kanalı Eti Raporu, Aralık 2006 (Europaid Framework, Agri-Livestock Consultants Ltd and WDC World Development Consultants S.A., Poultry Meat Report, December 2006)

CIVANER, E.Ç., 2005 , Dış Ticaret Müsteşarlığı, İhracatı Geliştirme Etüd Merkezi, Beyaz Et Raporu