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SUPPLY CHAIN IN TURKEY

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1 Introduction to the dairy sector

The Turkish livestock sector has displayed two clear trends: a declining number of animals and increasing productivity. Historical livestock inventory data show that Turkey's sheep, goat and cattle numbers were increasing before the 1980s and decreasing thereafter. All types of livestock have shown a general decline in numbers since early 1982. The number of sheep declined to 25 millions. Number of cattle declined to 10.5 millions in 2005 (Koc et al, 2001, Anonymous, 2005).

The milk sector is crucial in Turkey because it is important for a balanced and healthy diet, the development of the dairy industry, regional development, increased agricultural productivity and rural development.

There is a large discrepancy between East and West Turkey in cattle breeds. In Eastern Turkey, the local breeds are dominant. For genetics, feeding and many other reasons, their milk yield is very low (< 1000 litres) and are therefore not very attractive for dairy processing. In West Turkey, either pure breeds or cross bred breeds predominate. Their yields are around 6000 litres for the pure breeds and 4000 litres for the cross bred breeds. Although the number of cattle milked is decreasing, yield will continue to increase since the percentage of the pure breeds has been increasing.

Total milk production varies between 9.5 million tonnes and 10.6 million tonnes. With 10 billion litres of milk produced on average per year, Turkey is among the 15 largest world milk producers. Ninety % of this is cow milk (TURKSTAT, 2004), 2 % goat milk and 8 % sheep milk. In the last 15 years in particular, the share of cow milk increased constantly whereas buffalo, sheep and goat milk further decreased. Buffalo milk became almost marginal and has only a share of 0.3 % of the total milk production (Anonymous, 2005).

There are around 2160 processing units in Turkey with different sizes (MARA, 2005b). The biggest one is Ülker with a capacity of 1400 tonnes/day. There are four other big dairies with capacities above 1000 tonnes/day. These are Sutas, Pinar, the 1st private dairy established in 1974, Yorsan, and Danone. Bahcivan, Sakipaga, Kaanlar, Eker, SEK, Akova are other dairies with smaller capacities, which are at EU standards.

All the large dairies operate very modern factories up to EU standards. The Danone dairy is the most modern dairy of the Middle East. The Ulker dairy is probably the largest one in the Middle East. They process the full range of dairy products. Besides these large dairies, some tens of dairies process between 100 and 300 tonnes of milk per day, most of them in very good technical conditions. These dairies process mostly cheese, UHT milk and milk powder.

The industrial milk is mostly processed by the 10 largest dairies. The pasteurised milk share is minor and decreasing whilst UHT milk predominates is expanding. It is mostly full fat milk, mostly packed in Tetrapak 1 litre cartons. The market size is estimated to be 600 000 tonnes. But, there is also some production of UHT milk packed in sterilised extruded bottles and of sterilised milk packed in extruded PEHD bottles. Ulker and a few other powder plants process milk powder for their internal use. Turkey itself doesn't use milk powder to increase the yoghurt dry matter.

The Mandiras, an important part of the Turkish dairy industry, small scale processors in the small towns, have existed for a long time in Turkey. Most of them process less than 10 tonnes of milk

per day under very basic production conditions. The Mandiras are located all over Turkey, in the milk production zones and in the remote areas. There is a close relation between the Mandiras and the village community. Their activity is more or less regular depending on the milk supply. They process mainly cow milk, but also sheep and goats' milk. The latter are not collected by the existing dairy industry. The main emphasis of their production is white cheese.

Liquid milk consumption in Turkey seems quite impossible to quantify. There are two reasons for this: first the importance of the informal sector composed of the own-consumption and of the streets' milk delivered even in the large cities; second is the fact that many consumers process milk within the family into traditional milk products (mostly yoghurt). However, milk produced is basically used in four different channels. A large amount of the milk is used by medium size establishments. Large and modern establishments use 27 % of the milk. Street milk accounts for 15 %, which is quite high and considered a problem in the Turkish milk supply chain. 20 % of the milk is consumed at farms.

Turkey imports significant volumes of milk powder, mostly to be re-exported in other finished agro-food products. Trade in dairy products is very limited in Turkey. The total amount of imports was around US \$60 million and export around US \$54.5 in 2005 for all dairy products. Import duties on dairy products are between 100% and 130 %, and no export subsidies are given.

Exports of milk products mainly consist of long shelf-life products, with, cheese and butter the most important. Following the registration of traditional products which are highly consumed in the domestic market, an increase in their production and export is expected. In recent years, there has been a significant increase in the export of ice-cream; foreign investment has made a considerable contribution to this growth.

The Turkish livestock sector has been supported by several policies since 1923. However, government involvement in the market increased during the planned period. Recent livestock policies include the following measures: 1) Import restrictions or control on meat and meat products, dairy products, livestock, and animal feed resources, 2) veterinary services and animal disease control, 3) subsidised heifer and lamb distribution to producers, 4) improvement aid and artificial insemination applications, and 5) input and credit subsidies.

The subsidy programs had different objectives during different periods. In year 2000, a special Decree for Animal Husbandry Subsidies was issued, announcing direct payments for livestock farmers. The government also promoted the farming of feed products for the dairy/meat sectors. Subsidised loans are available for investment and operational purposes and are given to both companies and individuals. The amounts of subsidised credit or the activities to be subsidised are jointly decided by the respective bank and MARA.

To increase quality and yield, some support is provided within the Decree on support for the livestock sector for artificial insemination, herd book registration and fodder crop production. In addition, support is also provided to the sector through rural development activities, and pasture and meadow management and rehabilitation projects are carried out.

2 A dual sector

The 2001 Agricultural Census recorded 3 million agricultural holdings, of which 2,147,068 have cattle. A large number of farmers own and cultivate very small areas of the land; 65 % of the farms have less than five hectares of land. Small-scale family farms predominate in cattle

production with less than four cattle per farm on average. The production in this small scale farms is mainly oriented towards self-sufficiency and not targeted for market demands.

The milk producers in Turkey can be classified into 4 categories, as is the case in most countries (FAO, 2006):

1. Milk producers for self-sufficiency: Most such farmers are relatively old. They have 1 or 2 cows; produce agricultural products and some fruit and vegetables. The milk quality is generally poor and the milk is family consumed or locally marketed;
2. Small producers with between 3 and 10 cows: This “extended” self-sufficiency and direct sale to neighbouring consumers is the most common situation. Part of the milk can be marketed to a collection centers (CC), to a Mandira or to a small dairy. The milk quality is generally poor. The milk producers are generally aged or middle aged, these small farms produce different agricultural products, sometimes sharing activities;
3. Specialised milk producers with between 10 and 50 cows: The farms are often of medium size and specialised in milk production. The milk producers are relatively young. Most of their milk is delivered to a dairy;
4. Intensive milk producers with over 100 cows: These can be either private farms or state farms. Most of their milk, which is of high quality, is delivered to a dairy.

The Ministry has been conducting a new program on the categories and the number of livestock. This program will most probably be finalised shortly. If it is received in time the report will be amended. If not, category 3 will cover 10 to 99 cows.

The Ministry of Agriculture has developed an Identification and Registration Database (IRD) for bovine animals. As of December 2005 the number of holdings keeping bovine animals is 2,240,576. Farm holdings having less than 10 cattle account for 84 % of the total.

There are 396 farms in Turkey which have more than 100 cows (MARA, 2005b). Some of these farms are large, for example Koc-Ata-Sancak in South East Anatolia has 2500 cows, Saray in Central Anatolia 1800 cows, Global in Bursa 1200 cows and Dogan in North Sea Region 700. Some big dairies have invested in their own farms (like Dimes, Sutas and Pinar) or they entered into partnerships with large farms. The emergence of these farms is very recent, mainly since 2002 and their size tends to increase year by year. Also, new investments are carried out since milk is currently a profitable investment. This could be considered as an opportunity for the milk sector since the interest of large holdings will push the sector toward a more production with higher quality.

3 Prospects for dairy product consumption

The consumption of dairy products in Turkey has a long cultural tradition. Dairy products are part of the daily diet of the Turkish population. To a large extent the consumption is based on very traditional processed products without significant use of modern technologies. A large proportion of total milk production is consumed at the farm level, implying that even the poorest people living in villages and remote areas consume dairy products daily. The people living in

urban areas, particularly suburbs of large cities have the lowest level of consumption of dairy products due to their low income.

Family or farm consumption ranges between 28 % and 35 % respectively. According to different sources of information there is not always a distinction made between on-farm family consumption and the use for cattle feeding. There is also some uncertainty over the production of Mandiras; according to the estimations of FAO (2006) based on sample surveys this amounts up to 18 % of total production.

The average national human consumption is about 140 litres per capita. Although the cultural tradition of consumption of dairy products is quite important, the Turkish population has a relatively low level of per capita consumption compared to other countries (DPT, 2006). Turkey has a high consumption level for fresh products.

Dairy products are consumed in the form of liquid milk, fermented milk, ayran (a form of liquid yoghurt), different types of cheese and milk powder. Liquid milk itself (family consumption and the street milk) is rarely consumed as a drink. Most of the liquid (full fat) milk is processed at home into yoghurt. The Turkish (set) yoghurt is very widespread and consumed almost any time. The white cheese (feta type) is popular for breakfast. The Turkish people also consume significant volumes of ice cream.

Hatirli et al (2004) indicated that the price difference between unpacked and processed milk is the most important factor affecting household choice. Larger households are more likely purchase unpacked milk. Educated families and families with children prefer processed milk.

Fermented milk (yoghurt) is consumed in homogenised and non homogenised yoghurt. Ayran is consumed throughout the year. Mainly two types of cheese are consumed in Turkey: white and yellow (cashew) cheese with white cheese accounting for the bulk of Turkish cheese production. The white cheese is either industrially or cottage industry (Mandiras) processed. Hard cheese is mainly identified as yellow cheese or cashew.

Supply and utilisation tables of dairy products prepared by Agricultural Economics Research Institute (AERI) of Ministry of Agriculture and Rural Affairs (MARA) are shown in Annex 1.

Market stratification estimates made by a working group of Setbir / FAO marketing specialists (SETBIR, 2006) show that most of the milk is consumed as cheese and yoghurt. Milk equivalent consumption of cheese is around 90 kg a year whereas the consumption of milk is about 20 kg a year. Yoghurt and butter consumptions are 30 and 20 kg a year respectively. The income elasticity of demand for milk and dairy products in Turkey is high compared to carbohydrate products. It is expected that as the national income increases the consumption of these products will also increase.

4 Expert views on the challenges at the level of the milk production

In spite of the small family enterprise production structure in the dairy sector, during the recent years investment in the dairy sector has increased rapidly resulting in a significant increase in milk production. With increased income and consumer awareness, the demand for milk products produced via traditional methods has fallen steadily and the market share of pasteurised milk has increased. Marmara Region (39%) and Aegean Region (26.5%) are the leading regions. The

Eastern Anatolia Region and Southeastern Anatolia Region have considerably a small share in terms of dairy holdings.

The Turkish Cattle Breeders Provincial Associations were set up in 1995 to help provide breeding stock for farmers with at least 5 purebred cows. Animal identification and support for milk and forage production have resulted in an increase in the number of the members and the size of the farms. In recent years, the support and credit provided for the modernisation of dairy farms have encouraged the establishment of large intensive dairy farms in different parts of the country.

Most cattle are not registered, indicating informal subsistence farming, and many dairy farms are small in scale and inefficient, with quality not a primary concern. The number of purebred breeding cattle is small, resulting in very low milk yields. The area of fodder crops is relatively low; hence production of feeding stuff is low. The relative price of maize and soy beans means that bought-in feed prices are high compared with milk prices. Hence most small farms depend on pastures and meadows which are often overgrazed and have low carrying capacities; all of which results in low quality milk.

There is no nationally or regionally organised quality control in Turkey. The larger dairies such as Setbir dairies operate systematic controls but in the Mandiras and for street milk there is no control at all. To determine if milk is of good / acceptable quality, some simple tests exist such as the reductase time (methyethylene blue) and the alcohol test. As an example, Danone publishes the reductase time in all his CC and this is very reliable and efficient.

Milk prices in Turkey are determined by free market conditions but the absence of quality standards and the generally low quality means that the market is not a very efficient one. Some processing dairies have endeavoured to set up a quality payment scheme but they remain the exception not the rule.

5 Expert views on the challenges at the stage of milk collection from farms

The milk sector has a very complex marketing network (Anonymous, 2005) as is shown in Figure 1. Moreover there are differences between districts. The collection system reflects the absence of organisation in the Turkish dairy sector which lacks any vertical integration. The milk can be collected by Mandiras, by streets milk sellers or by collectors. There is also the possibility that the farmers bring their milk to a village collecting centre. The Collection Center (CC) is managed either by a local cooperative or by the municipality, sometimes by cooperative unions. The milk is delivered un-cooled after each milking in very various receptacles. In the West, most CC are equipped with a cooling tank, mostly financed by a dairy. The dairies themselves collect the milk once or twice a day, 7 days a week. This is a very expensive scheme, accounting for about 15% to 20% of the consumer price.

The streets' milk sellers collect the un-cooled milk from the farmers. It is often packed in plastic cans and stainless steel cans. Transportation is done in small vans. The milk is delivered once a day, generally in the morning. The streets' milk buyers are usually consumers in the suburbs of large cities.

Mandiras do not have an organised milk collection system nor do they have a distribution organisation for their processed products. They focus on processing. The farmers deliver directly

to the Mandiras, most of whose products is marketed in bazaars, small groceries and stores by wholesalers. Due to the low price of their products and the traditional cheese taste of their products Mandiras are well placed on the market. Some supermarket chains also market the Mandiras products at a very low price.

With its army of collectors, collecting centers, Mandiras, street sellers and middlemen, the Turkish dairy sector appears as a huge employment system but economically the system does not provide benefits to the milk producer nor to the consumer.

Dairy products are marketed in three ways: Organised distribution (networks) with a share of 31%, non-organised distribution (individual shops) with a share of 44%, and open distribution (bazaars and others) with a share of 25%.

The bazaars are open markets, where food products without any packaging can be purchased at low prices. Grocery retailers have traditionally been the main shopping place for food products. They are still important in the rural areas as well as in the medium cities but are in decline in the big cities. The supermarkets are retailers with at least 100 square meter areas, with at least 2 cash registers and are self- service.

6 Expert views on the challenges at the milk processing stage

The Turkish Milk Board (SEK) was created in 1968 which inaugurated the Turkish dairy industry. When privatised in 1995, the SEK was composed of 35 units in total and among them only 4 major units processing 75% of the milk SEK collected.

The Turkish food industry is rapidly growing. The number of food enterprises is approximately 28.000 and nearly 12% of these are dairy processors. The high share of milk and milk products in food industry is due to the high number of Mandiras (with insufficient use of high technology) and traditional consumption habits. After 1995, due to the increase in the efficiency of private sector and foreign capital investment, there has been an increase in the amount of milk produced and in the variety of milk products.

Most of the Turkish dairies produce more or less the same range of dairy products and operate on the same distribution channels. But, this doesn't seem the main concern for them. In fact, the largest concern for all these dairies is their milk supply in quality and volume. To supply their plants with relatively acceptable quality milk, the dairies operate over very long distances, often collecting milk in the region of other dairies, at a very high cost.

Overall there are more than 2000 dairy plants with total processing capacity of more than 4.5 million tonnes. Many dairies are modern, well equipped, clean, professionally managed and operate to EU standards and around 50 dairies have above 100 tonnes/day capacity. However, capacity utilisation is only about 50 %, as due to the low consumption levels of dairy products industrially processed per person and also the high share of the informal market, demand for the dairies' output is limited.

The structure of the milk processing industry changed substantially over last two decades. Increased concentration, higher product differentiation, and greater economies of scale are among these changes. Four-firm concentration ratio, CR4, has increased to about 50 %. Herfindahl index also increased to 35%. Processors realised cost savings from higher

concentration. They used their enhanced market power to increase milk prices (Hatirli et al 2006) as the elasticity of the milk is low (Pazarcioğlu et al. 2006). Although there are about 2000 dairy plants, concentration ratio indicates high CR4 and Herfindahl index. High concentration ratio indicates that the firms can have a market power. Therefore, firms can use this market power to increase the price. Most of 2000 firms are local and market their products locally. Only large firms can market their products nationally.

7 Conclusion

Turkey has a long tradition of milk production and of consumption of dairy products but the industrial processing of raw milk into dairy products remains a relatively marginal activity, compared to EU countries and even to some Mediterranean countries. Turkey has a large informal sector composed of family consumption, cottage industry and door to door delivery. Whereas the informal system represents about 70% of the milk produced, the industrial system consumes 30% of the milk produced, the lowest rate compared to all other EU countries.

Turkey is neither a large importer nor a large exporter of dairy products, the latter because its products are not competitive in price or quality; a situation that is unlikely to change in the near future.

The main problem and probably the source for most of the other problems of the Turkish dairy sector is the high share of the informal market. This is mainly due to the small scale of production throughout the dairy chain. There is an inefficient system of raw milk production and collecting, a high cost of raw milk and finished products, a lack of intervention by the State to regulate the market and inefficient subsidies. More than a million Turkish farmers have only 1 or 2 cows, producing basically for own consumption. Milk production is scattered throughout the country, milk quality is very poor and yield per cow is low. In addition, many milk processing units are also rather small.

In the short term, it is not expected that the low quality problem will be resolved. However, in the long run, especially with the EU entry negotiations, the sector will have to pay more attention to quality and efficiency.

Turkey will adapt the EU agricultural policy *acquis* over the period 2005-2015. A significant part of the *acquis* concerns sanitary and phyto-sanitary measures, animal welfare, hygiene standards and food safety. Turkey has already made a good start with passing the necessary legislation. However, several problems arise in the implementation of the regulations (Oksam *et al*, 2004). The creation of an infrastructure to manage the *acquis* is a long and difficult process. More difficult is the fact that the sector is highly fragmented; a substantial share of output is disposed of through informal markets or by own-consumption. Therefore, effective communication of the SPS *acquis* to producers, as well as monitoring and control of all regulations will be a difficult and daunting task.

The retail and food processing industry will require safe and high quality food from the farming sector. This may push many small farms out of the market since it will be hard for them to comply with those requirements (Berdegue *et al*, 2003). Small farmers can not make the necessary investment due to insufficient resources and the problems faced in accessing finance. In addition, large transaction costs make it difficult for retailers to deal with many small farmers rather than with a few large suppliers, especially in the case of unprocessed and perishable

products. Small and medium farms can have a future in the modern retail chain provided that they form a union and have access to input and output markets and they enhance the quality and quantity of their output. Consequently, Turkey has passed legislation on farmers union as an alternative marketing structure to increase the bargaining power of the small farms with agribusiness companies and to reduce transaction costs.

The net export will be affected by EU-Accession. Trade liberalisation 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 EU, livestock imports will increase considerably. Livestock production will decline as the largest price falls following trade harmonisation will be experienced in the livestock sector (Cakmak, 2004; Grethe, 2004).

Turkey initiated a pilot programme of Village Based Participatory Investment (VBPIP) supported by the World Bank within the Agricultural Reform Implementation Program with the objective of increasing rural income, raising social standards of the rural population, improving infrastructure by conserving natural resources and increasing sustainable productivity in agriculture while strengthening food security by taking into account the preservation of natural resources. The programme concentrated, among other activities, on the collection, cooling and processing of milk and will be implemented nationwide from 2006.

Annex 1: Information on the primary production

Table 1. Number of Agricultural Holdings Raring Cattle (2001)

Number of holdings engaged in animal husbandry	2,147,068
The number of holdings engaged with both crop production and animal husbandry	2,074,439
The number of holdings engaged with only animal husbandry	72,629
The number of holdings engaged with fattening of cattle and buffaloes	71,216
The number of holdings engaged with milk production from cattle and buffaloes	1,746,927
The number of holdings engaged with fattening of sheep and goat	40,427
The number of holdings engaged with milk production from sheep and goat	530,151
Total agricultural holdings in Turkey 2001	3,076,649

Source : TURKSTAT, 2001. General Agricultural Census, Agricultural Holdings (Households) Survey.

Table 2. Per capita consumption (kg)

	2002	2003	2004	2005 (Predicted)	2006 (Forecast)
Drinking Milk	21.00	21.00	21.00	21.00	20.96
Cheese	89.00	93.00	92.00	91.69	93.55
Yoghurt/Butter Milk	32.54	38.88	32.42	31.60	31.04
Butter	17.83	18.20	16.03	18.03	19.11
Milk Powder	2.51	3.41	2.81	2.71	2.60
Ice Cream	1.01	0.90	1.00	1.02	1.02
Total Milk*	132.09	143.95	136.77	136.20	138.14

*All milk and dairy products including drinking milk.

Source: AERI calculations based on Turkish Statistical Institute statistics

Supply and Utilisation of milk and dairy products

The following tables were prepared by the Agricultural Economics Research Institute (AERI) of Ministry of Agriculture and Rural Affairs (MARA). The calculations are based on milk equivalents Multipliers used are as follows: White Cheese: 6,65; Kasar Cheese: 9,16; Cream, melted cheese: 7,92; Other Cheese: 11,76; Yoghurt:1,3; Butter Milk: 0,7; Milk Powder: 10; Butter:15 and Ice Cream:1.

Table 3. Milk Products Supply and Utilisation (tonnes)

	2002	2003	2004	2005 b	2006 c
SUPPLY					
Beginning Stocks	946,459	918,665	877,869	835,099	793,856
Production (a)	8,422,110	9,271,033	8,850,990	8,919,525	9,136,328
Import	98,599	149,202	153,590	149,891	148,916
Total Supply	9,467,167	10,338,901	9,882,448	9,904,515	10,079,100
UTILISATION					
Total Domestic Use	8,472,816	9,370,517	8,958,943	9,011,307	9,231,345
Milk Products	75,686	90,515	88,406	99,351	101,475
Total Utilisation	8,548,502	9,461,032	9,047,349	9,110,658	9,332,821
Ending Stocks	918,665	877,869	835,099	793,856	746,280
Stok / Use Ration	10.75	9.28	9.23	8.71	8

(a) All types of products (b) Estimate (c) Projected,

Source: AERI, 2005, Calculations are based on TURKSTAT,

Table 4. Cheese Supply and Utilisation (tonnes)

	2002	2003	2004	2005 b	2006 c
SUPPLY					
Beginning Stocks	728,170	693,935	646,763	603,760	563,523
Production	6,026,520	6,405,570	6,427,236	6,519,205	6,740,434
Import	43,630	32,170	38,470	35,000	36,000
Total Supply	6,798,320	7,131,675	7,112,469	7,157,965	7,339,957
UTILISATION					
Total Domestic Use	6,033,296	6,400,292	6,427,719	6,503,441	6,736,295
Export	71,090	84,620	80,990	91,000	92,000
Total Utilisation	6,104,386	6,484,912	6,508,709	6,594,441	6,828,295
Ending Stocks	693,935	646,763	603,760	563,523	511,662
Stocks/Use Ratio	11.37	9.97	9.28	8.55	7.49

(a) All types of cheese (b) Estimate (c) Projected,

Source: AERI, 2005, Calculations are based on TURKSTAT,

Table 5. Yoghurt/Buttermilk Supply and Utilisation (tonnes)

	2002	2003	2004	2005 a	2006 b
SUPPLY					
Beginning Stocks	24,164	23,519	27,832	29,126	29,350
Production	2,204,945	2,679,828	2,266,335	2,241,597	2,236,629
Import	308	283	273	285	290
Total Supply	2,229,417	2,703,630	2,294,440	2,271,008	2,266,269
UTILISATION					
Total Domestic Use	2,205,881	2,675,735	2,265,072	2,241,343	2,235,423
Export	17	63	242	315	245
Total Utilisation	2,205,898	2,675,798	2,265,314	2,241,658	2,235,668
Ending Stocks	23,519	27,832	29,126	29,350	30,601
Stocks/Use Ratio	1.07	1.04	1.29	1.31	1.37

(a) Estimate (b) Projected,

Source: AERI, 2005, Calculations are based on TURKSTAT,

Table 6. Butter Supply and Utilisation (tonnes)

	2002	2003	2004	2005 a	2006 b
SUPPLY			Tonnes		
Beginning Stocks	143,000	148,177	150,016	149,861	148,169
Production		1,254,358	1,119,954	1,277,294	1,377,294
Import		78	31	25	23
Total Supply	1,357,041	1,402,613	1,270,001	1,427,180	1,525,485
UTILISATION					
Total Domestic Use	1,208,729	1,252,513	1,120,097	1,278,970	1,375,738
Export		85	42	41	43
Total Utilisation	1,208,863	1,252,598	1,120,139	1,279,011	1,375,781
Ending Stocks	148,177	150,016	149,861	148,169	149,704
Stocks/Use Ratio	12.26	11.98	13.38	11.58	10.88

(a) Estimate (b) Projected,

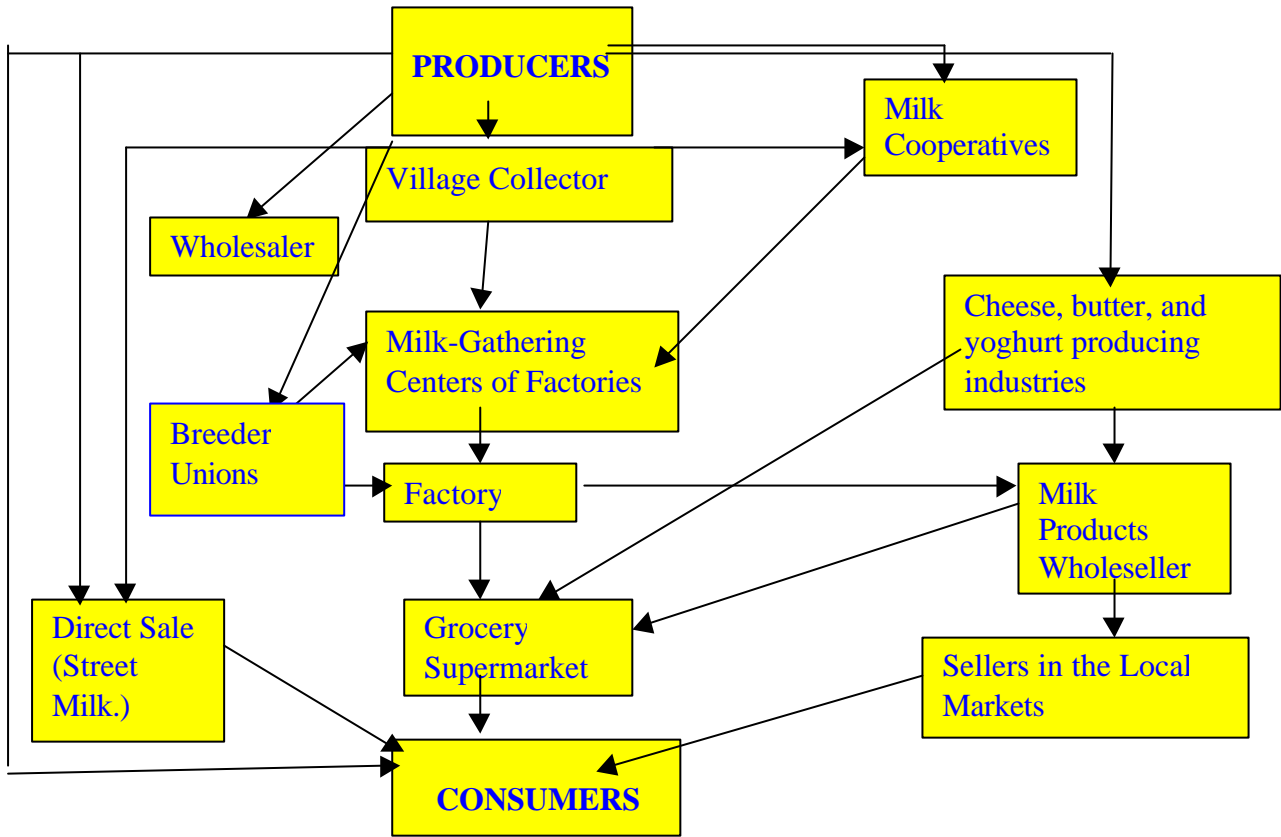
Source: AERI, 2005, Calculations are based on TURKSTAT,

Table 7. Dry Milk Supply and Utilisation (tonnes)

	2002	2003	2004	2005 a	2006 b
SUPPLY					
Beginning Stocks	45,125	46,837	47,169	46,076	47,132
Production	118,409	120,520	85,254	83,596	82,118
Import	54,180	116,439	114,289	114,118	112,118
Total Supply	217,714	283,796	246,712	243,790	241,368
UTILISATION					
Total Domestic Use	170,123	234,647	196,294	192,185	187,417
Export	754	1,980	4,342	4,472	5,472
Total Utilisation	170,876	236,627	200,636	196,658	192,889
Ending Stocks	46,837	47,169	46,076	47,132	48,479
Stocks/Use Ratio	27.41	19.93	22.97	23.97	25.13

Source: AERI, 2005, Calculations are based on TURKSTAT,

Figure 1. Milk and Milk Products Marketing Channels in Turkey



Source : Y, Uysal and I, Mazgit, 1993, "Türkiye Hayvancılık Sektörünün Sorunlarının Çözümüne Yönelik", Yasar Eğitim ve Kültür Vakfı, İzmir,

Annex 2: Information on the processing and manufacturing sector

Table 8. Number of Establishments, Capacity and Production (2002)

	Number of Establishments	Capacity (Tonnes)	Production (Tonnes)
Sterilised Milk	35	231728	91125,5
Pastorised Milk	48	286629	170645
Aroma Milk	2	11367	6102
Yoghurt	718	1083284,95	613946,83
White Cheese	832	1138536,5	218259,96
Kasar Cheese	552	215056,3	54291,85
Tulum Cheese	194	28666,5	9870,3
Melted Cheese	50	24506	11799
Curd Cheese	197	6506,7	2722,2
Gravyer Cheese	4	120	62
Other Cheese	169	20095	9100,5
Butter Milk	290	1154487,1	1018137,14
Cream	114	15302,4	8656,75
Whey Powder	42	35380	14043,4
Suzme Yoghurt	50	45765	18805
Milk Powder	38	21558	9863,5
Butter	340	107416,5	33546,39
Ice Cream	650	113714,42	18528,78
Edable Ice	6	83	67,2
Milk Gathering Center (Raw Milk)	15	80	57
Other Products	76	15422	10802
Total		4555704,37	2320432,3

Source: MARA, 2005b, Date Files, General Directorate of Protection and Control,

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