

**TURKEY COUNTRY REPORT ON
FARM ANIMAL GENETIC
RESOURCES**

ANKARA

2004

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Foreword

The first meeting for preparation of Turkey National Animal Genetic Resources Report was held in February 19, 2002 by the participation of related institutes, associations, unions and university representatives. Necessary information for the preparation of the report was officially required from related institutes. Draft National Animal Genetic Resources Report, which was prepared by Dr. Neval ÖZDOĞAN and Necati SALMAN from Lalahan Central Animal Research Institute, was reviewed during the meeting in 11.07.2002 by the representatives of the following institutes; State Institute of Statistic, General Directorate of Agricultural Research MARA, General Directorate of Agricultural Production and Development MARA, General Directorate of Agricultural Enterprises MARA, General Directorate of Control and Protection MARA, State Planning Organization, Department of External Relations and EU Commission Ministry of Forestry, and Ministry of Environment.

The draft report was sent to related universities, ministries, and institutions after the meeting. With regard to peer review comments and information came from different institutes some modifications has been made in the report by a group of expert under the supervision of Dr. Hayriye KEÇECİ in GDAR. The report was also reviewed at the Committee Meeting in 22.04.2003 . A sub committee was established in order to make the last corrections and finalize the English version of the report. The final English version of the report was completed on 27th of December 2003 by below sub-committee that consisted Dr. Lütfi TAHTACIOĞLU and Prof. Dr. Mehmet ERTUĞRUL. We acknowledged to Prof. Dr. Halil AKÇAPINAR, Dr. Sema YAMAN and Dr. Bekir ANKARALI for the contribution they have given to the preparation of the report. Special thanks to Mr. Süha DİNÇER for his effort on printing stage.

Chapter 1. Introducing the Country

1.1. Introduction of The Country and Its Agriculture

Turkey is located between 36° – 42° north latitudes and 26 ° - 45 ° east longitudes and has 77 945 000 ha of projection and 81 458 000 ha of total area. Turkey takes place at a region where continents of Asia, Europe and Africa come closer. The country is at the northeast end of the Mediterranean Sea in Southeast Europe and Southwest Asia. To the north is surrounded by Black Sea and to the west is the Aegean Sea. Its neighbours are Greece and Bulgaria to the west, Russia and Ukraine to the north (through the Black Sea), Georgia, Armenia, Azerbaijan, and Iran to the east, and Syria and Iraq to the south. The Dardanelles, the Sea of Marmara, and the Bosphorus divide the country in two parts. Turkey in Europe comprises an area about equal to the 3% of its total land which called Thrace. Turkey in Asia (Anatolia) is equal to the 97% of its total land. Its centre is a treeless plateau rimmed by mountains. Turkey has 2 875 km of territorial and 8 333 km of costal border line.

With respect to geographical figures the most prominent characteristics of Turkey is being a high country with an average elevation 1131 m. The country consists primarily of undulating plateaux rising eastwards from 800 m to 2,000 m, bordered by high mountains with fertile plains next to the cost and inland valleys. Much of the land is hilly, over one third having slopes of more than 20 %. It also shows significant diversity from the aspect of topography; high mountain ranges, inactive volcanoes and plateaus, inner and coastal high plains are the main elements of this diversity. With the exception of coastal areas, climate is characterized, by cold winters and hot dry summers. Much of the precipitation, averaging 350-600 mm, falls in winter and spring. This combination of climate and precipitation shortens the growing season except along the coasts and increases the vulnerability of soils to erosion, particularly if they are fallow or overgrazed, with sparse vegetative cover. Significant altitudinal differences in Turkey constitute seven distinctive geographical regions, which show diversities with regard to living conditions, economic activities and crop pattern even the areas close to each other.

Although water resources of country seem an important potential in the region, Turkey can not be considered as water rich country. There are more than 200 natural lakes which cover 9 000 km² area of Turkey. Majority of the lakes are concentrated in certain part of the country. Four large lakes constitute 65% of the lake areas of the country (Van, Tuz, Beyşehir and Eğirdir). In addition, there are plenty of dams which covers around 3 000 km², scattered all around the country. The largest of those is Atatürk Dam with 817 km² water surface, is located in Southeastern Anatolia.

Geographical regions differ from each other not only physical features but also socio-economic structure. The main characteristic of the geographical figures of Marmara Region can be described as fertile valleys lying in east-west direction and vast alluvial plains in Thrace and along the main rivers. Animal husbandry is rather intensified and advanced in the region. The mountains in Aegean Region straight forward to sea with sharp slopes; this region consists of coastal part and the transitional zones. The coastal valleys lie between sea and mountain skirt and finish with Aegean islands. Livestock industry has found a place among the diversified horticulture and crop production.

Mediterranean Region takes place in the south of Turkey and at the north coast of Mediterranean sea; the region is rather steep and rough. The deep and steep valleys in the region separate Taurus mountain ranges into West and Middle Taurus. South-eastern Taurus mountain ranges extend to southwards up to outward of Syria deserts with a curved curl. Black Sea region, lies along the northern costal line of the country. North Anatolian Mountains consist of several mountains ranges which constitute a significant part of the region. The mountains in the east of the region are high and closer to the sea. The heights of the mountains in western parts exceed 3000 m in most points. The lowest parts in the mountain ranges take place in Central Black Sea Region. The mountains in this part enter towards inland, opening room for fertile costal plains. Although, horticulture (hazelnut and tea) is the dominating farming activity in the region, livestock and apiculture have a considerable contribution to farm income.

Central Anatolia Region consists of vast and high plains located between the North Anatolian and Taurus mountains. There are several mountains at various heights scattered all over the central plateaus with 800-1000 m altitude. Vast plains take place in the dimple areas between the plateaus. Since steppes cover large areas in the region, especially sheep farming plays an important role in family income.

East Anatolia Region is high and mountainous due to closeness of the north and south mountains ranges to each other. Mountain Ağrı (5 172 m) the highest mountain of Turkey is in this region. Livestock industry is the main income generating activity for rural people. Despite the drastic decline in sheep number in last decades, both cattle and sheep farming as well as bee keeping is widespread in the region. The plateaus of Southeast Anatolia are relatively low and fairly smooth. The region consists of round hills and vast plains. Animal husbandry is one of the most important living sources of the people. Owing to ecological structure sheep husbandry is predominant in this part of the country.

Turkey is located in Temperate Climatic zone. Due to significant altitudinal variation, extending of high mountain ranges along the coastal lines and distance from the sea, three main climate types can be seen in Turkey. Mediterranean climate type; is characterized by hot-dry summers and warm-rainy winters, prevails in Coastal Mediterranean and is effective in Aegean coast up until Marmara Sea. Dump and warm climate is seen along the Black Sea coastal line. Due to the shelter impact of the Caucasus winters are especially milder in Eastern Black Sea coast. Continental climate; is distinctive with high temperature differences among seasons and between day and night. Cold winters, hot and dry summers are common in all interior parts of the country that can not benefit from the impact of sea due to the natural impediments. This climate type is dominant in Central, East, and Southeastern Anatolia and in inner parts of Thrace. However, it is possible to observe various micro-climates throughout the country.

Turkey attracts attention for its rich plant biodiversity. The number of plant species reaches 9.600, of which 3.000 are endemic. This obviously reflects the wealth of the country in this respect.

Forests land accounts for 25 % of land area with 20 703 000 hectares. Forest vary from productive, well managed coniferous and mixed deciduous/coniferous forest along the Black Sea and Mediterranean coasts to the degraded oak coppice forest, used and overexploited for fuel wood and fodder, that is characteristic of Eastern and South Eastern Anatolia. Poor management of rangelands has increased grazing pressure on forest lands and also lowered their productivity. Approximately 40 % of forest land is classified as productive and the rest is considered unproductive.

The rangelands, which constitute one of the largest (16 % of total land) renewable natural resources of Turkey, show great variation with regard to productivity and plant diversity. Rangelands have been reduced by half since 1950 as low fertility, often steeply sloping land has been brought into cultivation, while cropped area has increased by 60 %. The rangelands in Black Sea and Northeastern Anatolia regions are almost evergreen, whereas, the rangelands of Central and Southeastern Anatolia regions, which consists of mainly annual plants and remain productive for a period of one or two-months. The area of rangelands are 5.330.000 ha in Eastern, 4.000.000 ha in Central, 2.360.000 ha in Southeastern Anatolia, 870.000 ha in Black Sea, 620.000 ha in Aegean, 624.000 ha in Mediterranean 325.000 ha in Marmara Region. The total rangeland area comprises about 14.129.000 ha in Turkey. Approximately 3.500.000 ha of the rangelands of the country is in-forest, by-forest and upper-forest rangelands.

The total area used in agricultural production in Turkey is about 27 million hectares. Economically irrigable agricultural land in the country is about 8.5 million hectares. Cultivated land is dominated by cereal production, which accounts for nearly 50 % of cultivated area. Farmland is privately owned. Average farm size is 6.5 ha; however 62% of

farms are under 5 ha. Fragmentation through inheritance is an issue and increases the difficulties of using soil moisture conservation techniques across a sub-watershed. The amount of arable land does not show considerable variation among years. Around 33 % of the surface water and 78 % of the underground water potential is actively used in the country. Turkey does not have large amount of arable land as it is considered to be. Today the country has almost reached at the limit of the land to be opened for agricultural use. The latest observations show that Turkey is one of the 19 countries which have no more land reserve left. The amount of arable lands at 1st, 2nd, 3rd Classes has been gradually declining due to industrialization, urbanization, soil erosion, drought and inappropriate site selection for investments. Increased industrialization in recent decades, insufficient socio-economic infrastructures in rural areas and rapid population growth have accelerated migration from rural to urban areas and caused establishment of new residential areas. Such a process has always gone against the productive agricultural land and large areas have been lost because of uncontrolled constructions. The distribution of land use, excluding lakes, urban land, forests and military reserves is indicated below in Table 1.1.

Table 1.1 Land use and current trends (1000 ha)

Category	Area (1000 ha)	Area (1000 ha)	Current trend
	1991	2000	
Arable land	24631	23826	0
Permanent crops	3023	2553	0
Permanent pastures	12378	14129	+
Agricultural area	27654	26379	0
Land area	80028	80028	0
Total Area	81458	81458	

Table 1.2 Land use for livestock and current trends

Category	Area (1000 ha)	Area (1000 ha)	Current trend
	1990	2000	
Cropping for food	18 087	16 676	-
Cropping for feed	614	697	+
Cropping for food and feed	3 865	4 184	+
Natural pasture	12 378	14 129	+
Improved pasture	2	10	+
Fallow	5 324	4 826	-
Forest	20 199	20 703	+
Non-agricultural	20 989	20233	-
Total	81 458	81 458	

According to results of general census of year 2000, total population of Turkey is 67 844 903; population of province and district centers is 44 109 336 and population of villages is 23 735 567 (Table 1.3) Average population growth rates were 2.17 and 1.83 % over the period of 1985-1990 and 1990-2000 respectively. Population growth rate of provinces and districts was determined to be 2.7 percent in provinces and districts and 0.39 percent in villages. The difference between the urban and rural population growth rate is attributed to the migration phenomena. In accordance with the seven regions in the country, population growth rate is the highest in Marmara Region with 2.66 % and lowest in Black Sea Region with 0.39 %. Although East and Southeast Anatolia Regions constitute one third of the Turkey's land, they just accommodate 18.8 % of the total population. The developmental differences among the regions have caused an intensive migration movement from less developed to developed regions.

Table 1.3 Human population in the country

Year	Total (millions)	Rural or Farming (%)	Urban or Non Farming (%)	Total
1990	56473	40.99	59.01	100
2000	67845	35.00	65.00	100
Average annual growth rate	1.83	0.39	2.70	

Within the small scale family enterprises which constitute a significant part of the agricultural enterprises in Turkey, employment is met by the family members, provision of labor outside of family is either too low or none. The women undertake major parts of production activities on their own in these small family enterprises. Just a 3.6 % of the agricultural enterprises practice animal husbandry alone while 96.4% of them carry out crop and animal production together. A large proportion of livestock enterprises which deals with only animal husbandry are the farmers with no land (Table 1.4).

Table 1.4 Farm structure and distribution

Category	Number of farms / households	%	Number of farms / households with livestock	%
Landless	101610	2	101610	73
> 0 to 2 ha	1385129	34	22762	16
> 2 to 10 ha	1987758	49	13744	10
> 10 to 50 ha	557097	14	1524	1
> 50	36838	1	52	0
> 100 to 500 ha	0	0		0
Total	4068432	100	139692	100

SIS General Agricultural Census 1991

There is a total of 183 processing units in 44 provinces in meat industry including the small and medium-scaled enterprises and integrated plants in Turkey and some 15 033 people are employed in these sector. There are 351 small, medium and large scale enterprises and integrated industrial plants in 49 provinces in milk industry and about 9 429 people are employed in these units. In addition, there are about 24 000 food enterprises in the country. Around 18% of the food enterprises deal with milk and dairy products and 2.5% of them deal with meat and meat products.

1.2. Rural Development and Condition of Food Security

With respect to natural resources and ecological conditions Turkey is considered as a favorable country for agricultural production. Moreover, with a population of 67 million, Turkey is not only largely self-sufficient in food supply but has considerable net agricultural exports. It also has potential to produce more and to increase food quality and diversity. The existing capacity of the food industry is well over the requirement of domestic consumption. Turkey has information and labor force necessary in the fields of agricultural development, food technology and agricultural researches; it also has the potential to increase these over the current level and to use these more effectively. Per capita food consumption is high in crops, as an example, Turkey is one of the highest per

capita wheat consuming countries in the world.

Major part of the family food requirement is met by domestic production in rural areas. Traditionally, women are responsible so many important activities such as vegetable growing, small-scaled animal husbandry, collection of natural food, preparation of food for conservation and domestic chores.

Malnutrition results not from low supply of food, as it is common in some countries but from lack of education, habits, tradition and lack of income. To some extent, these problems can be overcome by the help of education and enhancement of living standard of the people.

Chapter 2. The State of Production Systems

2.1. A General Review of Animal Production Systems

Historically, livestock and livestock products have played important roles in the Turkish agricultural economy and rural society. Mixed farming is the predominant farming system, with 86 percent of farms practice livestock and crop production together. Animals feed on rangeland, pasture and crop residues in the summer, conserved forages, straw, and purchased concentrate in the winter. The winter diet is often deficient, and animals are frequently put out to grazing on communal rangeland too early in the spring for vegetation to be established. Rotational grazing is rarely practiced, further reducing range productivity. In the center and east Anatolia rangelands vegetative cover averages only 10-20 % compared with the 40 % that is necessary for an effective erosion control. However, 80-90 % vegetation cover could be achieved with proper management.

Turkish livestock products such as leather products, wool carpets, mohair, soft cheese, yogurt, buttermilk and honey are worldwide known. However, contribution of livestock industry to Gross National Product (GNP) has been drastically declined in last two decades. The share of agriculture in GNP was 26

% in 1980, but it decreased to 13.6 % in 2002. The same trend can be observed for agricultural export. Livestock industry accounts about 25 percent of the agricultural GNP in the country. The rate of the employment in agricultural sector to the total employment has decreased from 62.5% to 45% over the period of 1980 to 1999. Although the share of agriculture has relatively decreased in GNP and total exportation, agriculture still keeps its importance due to the high rates of the active population in the sector and employment and its direct relationship with nutrition. Recently, Turkey has become a net importer of livestock products and is increasingly dependent on the world market. While productivity has risen over the last decade, the Government's protective measures have not resulted significant production gains.

Table 2.1 Importance of livestock to the GDP in agriculture (millions of \$US)

Activity	\$US (millions)	Data from Year
Livestock production (official statistics)	\$18.939	2000
Other agricultural production (official statistics)	\$23.939	
Best estimate of additional value of livestock		

When the figures of 1991-1994 and 1995-1998 periods were evaluated, it is evident that average share of imported agricultural product of Turkey in the world market increased from 0.7%, to 1.1% and export of agricultural products was decreased from 1.6%,to 1.5%

Import and export figures of animal products as of years 1992 and 2001 are shown on Table 2.2 and 2.3.

There has been a rapid increase in domestic demand of meat, milk and egg in the country in recent years. It is reported that only 8.2 % of the per capita daily average (3196 Kcal) receipt has been provided from animal products in the period of 1988-1990. The growth in supply of animal products has fallen behind the increase of demand in recent years.

Table 2.2 Major livestock primary product imports (1000 tonnes/numbers)

Species	Meat (t)		Milk (t)		Eggs (t)		Fiber (t)		Skin (No.)		Animals (No.)			
	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001		
Cattle	30334		22412	8748					1959230	1404545	198355	290		
Buffalo														
Sheep	238	20							38997	34764	34097042	38175073	417	4000
Goats													2499489	2628130
Camels														
Horses									1078	186	65	419		
Donkeys											20			
Pigs	83	23												
Chicken	2727	211			54	135					1587255	3086501		
Turkey														
Ducks														
Geese														
Rabbit														

Table 2.3. Major livestock primary product exports (1000 tonnes/numbers)

Species	Meat (t)		Milk (t)		Eggs (t)		Fiber (t)		Skin (No.)		Animals (No.)				
	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001	1992	2001			
Cattle	364	56	3085	8889					1500	95757		7724			
Buffalo															
Sheep	4989	266							2552	18666	122132	4782279	799143	433044	
Goats	3	40											6303	210136	10600
Camels															
Horses	12										59	42			
Donkeys															
Pigs	19	4													
Chicken	1285	24217			0,5	27						44180	2809222		
Turkey															
Ducks															14138
Geese															
Rabbit															

According to the data of State Statistics Institute (SIS), while there were 49.6 million sheep in Turkey in 1981, this figure fell down to 30.2 million in 1997. Within this period, the number of goats decreased from 18.9 million to 8.4 million; and the number of cattle population went down from 16.0 million to 11.2 million. Quite the contrary, significant developments have been made in poultry industry in the same period; the numbers of broilers and layers have increased 2.8 folds.

The data related with slaughtered cattle shows that there have been significant increases in carcass weight in comparison to the beginning of 1980s. For instance, while average cattle carcass weight was 120.5 kg between 1984 and 1986, this figure increased to 174.2 kg in the period of 1994-1996. In the same period, lamb carcass weight increased from 12.1 kg, to 14.3 kg. Despite the decline in animal number, owing to the increase in carcass and milk yield per animal, total production has been increased in the mentioned period. However, the progress made in sheep farming could not compensate the decrease in sheep product due to the sharp decline in sheep number. The advancements in genetic composition and feeding practices have been the two major elements which were affective in the increase of animal yield. However, these achievements in livestock product yield and production have not been sufficient to meet the domestic demand. When the current livestock farming systems in the country are considered, the existence of significant bottlenecks which prevent establishment of an efficient livestock production system can be seen. These may be listed as; genetic potential of animals, feeding and management practices, high production cost, insufficient domestic demand due to low income level, marketing problems and insufficient fodder supply.

Production cost and farm income show great variation among livestock enterprises and geographic regions. This situation is especially valid for small scale cattle and sheep fattening farms and livestock sector. In addition to animal production systems, these enterprises generally diversify their farming activities by crop or vegetable production. When the breeds (local, crossbred, purebred) are taken into account, feed conversion rate and net income per farm in cattle raring activities show significant differences. This situation is more evident in dairy farming. In this sector, feed conversion rate and milk yield in purebred is well above the local and crossbreds. Feed conversion rates in cattle and sheep fattening and raring farms are rather high. The reason for that is; the use of low quality hay, bran and straw at higher rates in the rations. On the other hand, sugar beet pulp and green by products of certain crops considered as silage feed group by farmers. When the grain feeds considered alone, feed conversion rate is

relatively lower.

The reasons behind the considerable differences of feed efficiency rates in cattle and sheep farming between the regions are; animal breeds, feed availability and quality , ecologic differences and length of grazing period on rangelands.

In contrast to cattle and sheep farming systems, large commercial enterprises are dominant in broiler and layer sectors. In this sector, almost the whole family income is obtained from only broiler or layer production. This rate is over 80% in most regions and in some regions, close to 100%. The proportion of income coming from livestock production in total family income is between 40-70 %.

According to the Household Labor Force Public Survey (SIS) of the year 2002, the women over 15 years of age, constitutes 26.4% of the people employed in rural areas. While the proportion of employed woman in total employment was 19.75 percent in urban areas, this rate was determined 35.4 percent in rural areas. Of the employed women 53.2 percent, work in agricultural sector and family labor without payment, constitute 76.4 percent of the women in the sector. Again according to the same public survey, the women constitute almost half (46%) of the total active population in agricultural sector. The reality put forth by the data that like other developing countries, participation of rural women in labor force is higher than urban women, and rural women take place in active population and productive working group in Turkey. The most valid generalization on this is that labor- intensive works based on manual labor are carried out by the women; and mechanized high-level technology works are done by the men. Apart from child rearing and their traditional domestic task, women play a major role in agriculture. This is more pronounced in the smallholder households and when the husband has outside employment. By and large, the sexual division of labor is not rigid, but women tend to do more of the labor intensive and traditional types of activities, while the activities of men are more market oriented and concern external relations. The feeding and milking of livestock are female chores, but women also make significant contributions to crop production.

2.2. Husbandry

2.2.1. Cattle and Water Buffalo Husbandry

With respect to the figures of 2000, 89% of total milk and 30.7% of meat production is provided by cattle in Turkey. A significant proportion like 84% of the dairy enterprises in livestock sector has 1-4 heads of dairy cattle. Likewise, 87 % of cattle fattening enterprises have less than 10 animals.

The geography, socio-economic and cultural structure, presence of livestock improvement projects has had a significant impact on the distribution of cattle breeds and their population throughout Turkey. Anatolian Black (Yerli Kara), which is one of the local breeds of Turkey, had a high population and was very common in Central Anatolia, due to intensive crossbreeding in recent decades, its population dramatically declined and become a threatened breed in the region. Eastern Anatolian Red (Doğu Anadolu Kırmızısı) is a breed of Eastern and North Eastern Anatolia and it has the second largest distribution area after Anatolian Black. Anatolian Gray (Boz Irk) is widespread in Aegean and Marmara regions. South Anatolian Red (Güney Anadolu Kırmızısı) is extended in East Mediterranean region and Southeast Anatolia. All these local breeds used to have rather large populations and extension areas, but the number of purebreds has declined and even their populations have come to the threshold level of extinction due to crossbreeding in recent decades.

Holstein Friesian, Brown Swiss and Turkish Brown Swiss are wide-spread from west to east. Jersey is especially common in Black Sea region and Simmental can be seen throughout the country.

The Swiss Brown was first crossed with Anatolian Gray and new crossbred was called as Karacabey Brown (Karacabey Esmeri). Later on, a definition was made for the Anatolian Black and Eastern Anatolian Scarlet or Brown, including the crossbreds of them called as Turkish Brown Swiss. Holstein has been used in crossing with the local breeds in Marmara and Aegean regions and Jersey has been used crossing with native breeds of Black Sea region. These genetic

improvement activities were first initiated by the state and have been well adapted by the breeders. Angus and Hereford were used in crossing to improve carcass yield of local breeds but those studies have not been successful.

In order to establish pedigree recording system which was supposed to constitute the base of the cattle improvement programs in Turkey, in cooperation with Universities and Cattle Breeders Association of Turkey (CBAT), MARA prepared a Pedigree Regulation System on breeding dairy cattle was put into effect on 06 January 2000. Definition, inspection of milk production, classification of breeding cattle according to phenotype, lactation, calving, insemination and leaving records, breeding program, reproductive efficiency and breeding value estimations were issued in eight directives under the topic of Pedigree Regulation in breeding dairy cattle.

Active breeding program in cattle population is executed by Bahri Dağdaş International Agricultural Research Institute, Çukurova Agricultural Research Institute under the body of MARA and by CBAT in cooperation with MARA. The objective is to reach 7000 kg of average milk production with 4% fat content during 305 d lactation in Holstein. For this purpose, bulls are chosen by progeny testing. The Association also aims to carry out similar studies for Brown and Jersey.

Artificial insemination (AI) practices are rather widespread in cattle breeding. AI field studies carried out under the body and control of the Ministry is still continued with 520 mobile and 250 fixed AI teams in 81 provinces, 631 districts and 11 834 villages. In year 2000, 758 AI teams and 460 private veterinarians performed AI especially in western provinces.

Pedigree Regulation in Breeding Dairy Cattle arranges progeny testing studies to be applied in breeding tested bulls required in Turkey. With this Regulation, the authority and responsibility of bull breeding, testing, choosing, sperma producing and marketing from these bulls and arranging the usage of sperma tested and controlled are given to MARA and to the institutions authorized by

the Ministry. MARA has the authority to certify and audit the improvement program to be prepared by the authorized institutions. In accordance with the provisions of the Regulation, “Progeny Testing Project” is jointly carried out by the Ministry and the CBAT in the AI Laboratory in İzmir Province, in accordance with the agreement between them. 27 candidate bulls selected from dairy cow enterprises included in the pedigree studies of Central Association are tested for the progeny testing to be carried out within the scope of this project.

Anatolian buffalo (domestic) used in breeding, exists generally in Samsun, Afyon, Sivas, Muş, İstanbul, Çorum and Tokat provinces. The number of buffaloes, which was 371 000 in 1990, decreased to 146 000 in 2000. Buffalo is bred in certain regions and especially extensively.

2.2.2. Sheep and Goat Husbandry

According to data belonging to the year 2000, 11.48 percent of meat and 10.15 percent of milk production of Turkey provided by sheep and goat species. Sheep breeding in Turkey is generally carried out by small structured native sheep breeds having low fertility and milk yield and rough fleece production. Native breeds constitute 97.3% of the total sheep population in the country. Akkaraman (White Karaman) mainly located in Central Anatolia is ranking in the first order as its population among the native sheep breeds. Morkaraman, which is widespread in Eastern Anatolia and Dağlıç in Western Anatolia are the 2nd and the 3rd. Kıvırcık exists in Aegean and Marmara regions, Karayaka breed in Black Sea region, Gökçeada in Gökçeada-Çanakkale region, Sakız (Chios) in coastal parts of Aegean-Marmara, Turkish Merino in South Marmara-Central Anatolia regions, Ivesi (Awassi) in South East Anatolia and Tuj (Tushin) breed in Kars province and premises.

As native hair goat constitutes 94.8% of the goat population of Turkey while Angora goat comprises 5.2 % of it. Hair goat breeding in Turkey is densely practiced in West, South, Southwest, and East Anatolia. Hair goat is also bred in the Northern Anatolia.

Small family enterprises are dominant in sheep and goat husbandry. This structure provides the continuation of production style with extensive and conventional methods in the sector.

Turkish Merino and Karacabey Merino have been developed by crossbreeding German Meat Merino and Kıvırcık; and Anatolia Merino has been developed by crossbreeding German Meat Merino and Akkaraman by MARA.

2.2.3. Poultry Husbandry

According to the data belonging to the year 2001, there are total 10 555 poultry enterprises in Turkey. As distribution of total numbers of enterprises; there are 57 layer and 198 broiler breeding, 1 439 layer production and 8 861 broiler enterprises in the country.

Poultry farming is intensively practiced especially in Marmara, Aegean, Central Anatolia, Black Sea and Mediterranean regions. Poultry production is an integrated sector. However, it is dependent on import by means of providing breeding material. Studies on improvement of layer parent lines with pure lines were started in 1995 by MARA.

Denizli and Gerze, native poultry breeds of Turkey draw the attention of the people as a hobby.

Turkey husbandry, which showed a rapid development in a short time, is densely practiced in Marmara, Central Anatolia and Southeast Anatolia regions.

Although native goose is especially bred in cold regions like Kars, it is bred semi-intensively in almost every region of Turkey. Duck husbandry is also made for family consumption without considering any commercial purpose almost every region of the country.

Also wild animal species such as partridge, pheasant and quail are bred for meat production or to be sent to the nature.

2.2.4. Dog Husbandry

There are Turkish origin Akbash Turkish Shepherd Dog, Kangal Turkish Shepherd Dog and Kars Turkish Shepherd Dog breeds, which are bred in order to protect the herds in rural areas and as a guardian. In addition, Çatal Burun Hunting Dog and Turkish Greyhound are among the native dog breeds.

2.2.5. Equine Husbandry

Despite the rapid mechanization in Turkish agriculture, animal power is used in field cultivation and transportation in some regions especially in steep lands and in small agricultural enterprises. On the other hand, horses are gaining importance day by day in sports activities. Native equine breeds are Anatolia, Çukurova, Uzunyayla, Canik, Gemlik and Malakan. Other breeds are English, Arabic and Haflinger horses. For transportation and carrying power in rural areas native donkey and mule breeds are used.

2.2.6. Camel Husbandry

Although camel is used by the migrating communities, its usage in this field and number of camels has decreased significantly. There are a few camels for camel wrestling and touristy purposes.

Table 2.4. Livestock population, number of owners/house-holders and employment by species

Species	Livestock population(1000)	Number of owners/householders ¹
Cattle	10 761	3.50
Buffalo	146	0.05
Sheep	28 492	9.27
Goats	7 201	2.34
Camels	1	~0
Horses	271	0.09
Donkeys	588	0.19
Pigs	3	~0
Chicken	258 168	83.96
Turkey	3 682	1.20
Ducks	1 104	0.36
Geese	1 497	0.49

¹ : 1991 and 2000 SIS data

Table 2. 5. Major livestock primary production (1000 tonnes/numbers)

Species	Meat (t)		Milk (t)		Eggs (t)		Fiber (t)		Skin (No.)	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Cattle	329045	354636	7961000	8732041					3041350	2272234
Buffalo	11445	4047	174000	67330					90980	25870
Sheep	143570	111138	1145000	774380			45180	43139	10311150	6602950
Goats	22530	21394	338000	220211			5565	3118 ³	1579090	1232024
Camels	75	8	-	-					340	32
Horses	-	-	-	-						
Donkeys	-	-	-	-						
Pigs	330	274								4015
Chicken	282064 ¹	643436			431123 ²	844287				
Turkey	-	19242								
Ducks	-	4								
Geese	-	12								
Rabbit	-	-								

¹: 1995 SIS data, ²: 56 g Per egg, ³: Fiber and wool.

Table 2. 6. Relative importance of livestock products and services within species (%)

Species	Milk	Meat	Eggs	Fiber	Skins	Risk management	Fertiliser manure	Draught	Culture	Recreation	Fuel	Feather	Environment Management	Total
Cattle	40	40			5	0	5	0	5	0	5		0	100
Buffalo	45	40			10	0	0	0	5	0	0		0	100
Sheep	30	40		10	5	0	5		5	0	0		0	100
Goats	35	40		10	5	0	0		10	0	0		0	100
Camels	0	5		0	0	0	0		30	65	0		0	100
Horses	0	0		0	0	0	0	30	40	30	0		0	100
Donkeys	0	0		0	0	0	0	30	40	30	0		0	100
Pigs		100		0		0	0	0	0	0				100
Chicken		40	40			0	5	0	10	5		0	0	100
Turkey		80	10			0	0	0	10	0		0	0	100
Ducks		15	10			0	0	0	15	0		20	40	100
Geese		10	10			0	0	0	20	0		40	20	100
Rabbit		45		5	45	0	0	0	0				5	100

Table 2.7 Relative importance of species within livestock products and services (%)

Species	Milk	Meat	Eggs	Fiber	Skins	Risk management	Fertiliser manure	Draught	Culture	Recreation	Fuel	Feather	Environment Management
Cattle	70	45			20		40	0	5	0	30		0
Buffalo	5	5			1		0	0	20	0			0
Sheep	20	15		90	65		23		15	0	40		0
Goats	5	5		10	14		23		30	0	30		5
Camels	0	0		0	0		0		0	25			0
Horses	0	0		0	0		0	40	5	50			5
Donkeys	0	0		0	0		0	60	5	25			0
Pigs		0		0			0	0	0	0			
Chicken		25	95				14	0	5	0		5	10
Turkey		5	0				0	0	5	0		0	0
Ducks		0	5				0	0	5	0		15	50
Geese		0	0				0	0	5	0		80	30
Rabbit		0	0				0	0	0				0
Total	100	100	100	100	100	0	100	100	100	100	100	100	100

Chapter 3. The State of Genetic Diversity

While determining the breeds under risk, decreasing speed in the numbers of animals and degree of intensity in crossbreeding have been considered besides the current number.

Table 3. Breed Diversity (Number of Breeds)

	Number of breeds							
	Current Total		At risk		Widely used		Lost (last 50 yr)	
Species	L	E	L	E	L	E	L	E
Cattle	23	4	6	—	2	4	15	—
Buffalo	1	—	1	—	—	—	—	—
Sheep	24	1	12	—	9	—	2	1
Goats	6	1	4	—	2	1	—	—
Horses	7	3	6	1	—	2	1	—
Donkeys	2	—	2	—	—	—	—	—
Pigs	—	—	—	—	—	—	—	—
Chicken	4	—	2	—	—	—	2	—
Turkey	1	—	—	—	1	—	—	—
Ducks	1	1	—	—	1	1	—	—
Geese	1	—	1	—	—	—	—	—
Rabbits	1	1	1	—	—	1	—	—

L = Locally Adapted or Native; E = Exotic

Chapter 4. National Policies, Strategies, Programs, Tendencies, Infrastructural Condition Related to AnGR

4.1. Previous Policies, Strategies and Programs

Animal husbandry sector in Turkey has been supported by various policies since 1923. State support was intensified on genetic improvement of native breeds, disease control and veterinary services until 1950s. State intervention to marketing activities was started at the beginning of 1950s.

4.1.1. Product, Price and Market Policies

Red Meat: State has played an active role in red meat market by means of Meat and Fish Agency (EBK) from the beginning of 1952. EBK has been established in order to form a modern processing sector and to preserve the producers by way of minimum prices. EBK has undertaken the duty of preventing unessential animal movements between the regions by diversifying purchase prices besides price subsidies.

Market share of EBK is on a low level like 10 %. EBK has 29 slaughterhouses, 2 meat-processing plants and 2 broiler slaughterhouses. All the other slaughterhouses have been privatized.

Meat Support (incentive) Premium: State introduced support premium in meat in 1st May 1990 in order to subsidize the prices on producer base. Another aim of the premium implementation, besides price subsidy, is to increase carcass yield and qualities. This premium has been implemented on the animals slaughtered in EBK or in private slaughterhouses. The procedure was abolished in January 1995.

Milk: State has had activity in dairy market by means of Dairy Industry Agency of Turkey (TSEK). The main function of this institution was to support producers by determining market price. Before privatization, TSEK used to buy 5% of milk production and had a share of 25% in drinking milk market. Before privatization in 1995, TSEK used to have 34 dairy plants.

Milk Incentive Premium: MARA was implemented milk incentive premium on 1st May, 1987 in order to encourage dairy animal husbandry, to raise the income level of the country, to ensure the transition of the milk produced to the qualified enterprises, to improve technology and to ensure the consumers to consume qualified milk and milk products. A premium used to be paid to the producers as per liter milk sold to TSEK or other private companies (in accordance with having certain qualifications). Implementation of milk incentive premium was abolished in January 1995 and restarted in December 1995.

Price Subsidy for Merino Wool: Turkish Wool and Angora Inc. (YÜNYAP) started its activities in 1956 as a public enterprise. The purpose of YÜNYAP was to encourage Merino sheep rising and Merino wool marketing. State subsidized Merino wool prices between the years 1976 and 1985 by means of YUNYAP. Until the year 1984, quotas were implemented on importation of Merino wool, but some quotas were abolished in 1985. Customs tax on Merino wool has varied between 1% and 2% since 1993.

After this unrestricting, importation of Merino wool has started to increase. For example, 20% of the domestic demand was met by means of importation in 1992.

Price Subsidy for Angora: Angora prices were subsidized by the state between the years 1970 and 1994 (excluding the period 1983 and 1987) by means of Association of Agricultural Sale Cooperatives of Angora (**Mohair**) and Wool; and Wool Industry Inc. (YÜNSA). Approximately 60% of the annual angora (**mohair**) angora production of the country in the period 1970-1994 was purchased by these two institutions. Angora price subsidy was abolished in 1994.

4.1.2. Input Price and Market Policies:

Feed Subsidy: The state has intervened with the feed market by means of YEMSAN, which is a public enterprise, until recently. In 1993, the role of the 26 feed factory belonging to the state, has remained limited in arrangement of the market. On the other hand, they have undertaken the duty of selling the standard quality feed with an appropriate price margin. Such an implementation indirectly had an impact on price stability and improvement of feed quality. These factories belonging to public have been privatized.

AI Subsidy: MARA started insemination policies in 1949. After the year 1985, private sector has been included in insemination activities and subsidized by the government.

Import Subsidy for Breeding Heifers: Importation of breeding heifers in Turkey was subsidized by the state from 1987 to 1996.

Veterinary and Drug Subsidy: Producers benefit from the animal disease control activities carried out by the government. Private sector has also been providing such services on behalf of MARA since 1985. In addition, since May 1987, 20% of the veterinary and drug costs are returned to the producers.

4.1.3. Loan Policies

Agricultural Bank of Turkish Republic (TCZB) is the main source of the loans used in plant and animal production in Turkey. In addition to the TCZB, Agricultural Credit Cooperatives (TKK) and Agricultural Sale Cooperatives which are mainly financed by TCZB have provided loans to producers.

Table 4. Policies Implemented in Animal Husbandry Sector

Date	Target	Policy
1993	Livestock	Interest-free credit contract for fattening enterprises
1995	Livestock	Low- interest loans for procurement of breeding cattle
1995	Livestock	Low- interest loans for development of livestock in East and Southeast Anatolia
1995	Livestock	Subsidized loans for the purchase of cattle for breeding and fattening
1995	Livestock	1 trillion TL credits were allocated by government and distributed to livestock farmers on the bases of 2 year duration and with 20 percent interest rate.
1995	Livestock	Mass Housing Tax terminated for fattening calves importation and reduced of it for fattening cattle
1994	Livestock & Products	Mass Housing Tax lowered by one third for import of livestock and livestock products
1994	Livestock & Products	EBK and TSEK have been taken in the frame of privatization study
1994	Milk	Milk support premiums increased 17 fold in nominal terms
1995	Milk	TSEK privatized
1990	Meat	Meat incentive premium introduced
1992	Meat	Meat support premium stopped
1994	Meat	Meat support premium reintroduced
1995	Meat	EBK privatized.
1993	Wool	Tariffs eliminated, only 1-2 % customs duty reestablished
1994	Feed	YEMSAN privatized.
1996	Feed	“Set Aside Pasture Support”; subsidized payment for 30-40 percent of seed cost (min 1ha of establishment /per cattle)
1996	Feed	In irrigated or high-rainfall areas, 30 percent of production cost of alfalfa subsidy to farmers for 1 ha of alfalfa establishment

1996	Feed	30 percent subsidy for purchase of equipment for fodder production
1996	Feed	50 percent establishment subsidy and 50 percent wheat income to farmers shifting from wheat production to fodder crops in marginal land
1988	Breeding	Permission was given to private sector to import breeding bulls and pregnant dairy heifers
1990	Breeding	6-10 TL subsidy payment was given for per AI
1998	Breeding	400-600 000 TL semen support for per AI and 25% of services cost of AI have been paid to producers
1998	Breeding	TCZB has started credit implementation with 20 percent interest rate, 10 years due time and without 3 years payment for the infrastructure investments (e.g. machinery and equipment) and operating expenses for substitution of pure bred stock for the native milking cattle.
1995	Import Duty	Import duties from EU, EFTA and other countries set to 5 percent for non-breeding cattle
1994	Import Subsidy	25 percent (of CIF) subsidy to farmers purchasing imported milking cows, and certified calves of imported animals
1996	Import Subsidy	30 percent subsidy for imported milking cows.
1998	Imports	Increase in import limit for dairy cows from 100 thousand to 250 thousand
1998	Imports	Quotas initiated for beef importation

4.2. Current Policies, Strategies and Programs

Because agricultural activities are within the interest and duty of many institutions, “Board of Restructuring and Supporting in Agriculture” has been put into effect on 10th December 1999 in order to eliminate the problems, increase affectivity and efficiency in agriculture and agricultural subsidy policies, ensure stability in the sector and coordination between the institutions. In this framework, to support and direct agricultural sector, an “Agricultural

Fund”, similar to FEOGA in EU, has been established in order to provide financing.

In accordance with the laws and regulations issued, such working groups as Animal Health Consultation Board, Milk Council, Turkish National Zoonoses Committee, Veterinary Drug Commission, Mediterranean Zoonoses Center, Vaccine Production Permission Commission, Vaccine Importation Preliminary Permission Commission, National Committee for Conservation of Animal Genetic Resources and Breed Registration Committee have been established.

The subject of “Farmer Organization” has gained importance. The efficiency expected from the organization has not been achieved due to the negative sides experienced in existing producer organization and the problems caused by this structure. The studies on establishing producer unions and providing an effective structure are being carried out under the coordination of MARA in order to bring a solution to the subject and the prepared “Draft Legislation on Agricultural Producer Unions” has been issued.

The studies on framework agricultural draft legislation on “Rearrangement of Agricultural Services” are being carried out.

“Decree on Subsidizing Animal Husbandry” has been prepared. Significant developments will be achieved in animal husbandry of Turkey by the help of the “Decree on Subsidizing Animal Husbandry”, which has been prepared by MARA and to be continued for a period of 5 years; and with the measures taken against illegal animal movements. This decree was published in the Official Gazette on 10th May 2000 and approximately 33 trillion TL of budget is allocated for the year 2000. Subsidy will be provided to the fodder plant producers certified by MARA, to the buyers of heifers (breeding heifers or pure breed) bred by farmers or GDAE and certified by MARA, to the breeders making artificial insemination (AI) and to the AI teams to be established by real persons or entities and the institutions.

Law on Insurance of Agricultural Products has been issued in order to use the resources transferred by the state due to natural disasters but has not reached the aim, in a more rational way and to protect the producers against the losses, which may occur. Although there are animal life insurance, animal feeding insurance, insurance of poultry animals and insurance of fisheries within the scope of insurance sector, it is seen that only animal life insurance is being implemented. The risks such as efficiency loss, breeding value loss, disease and theft are out of the scope of insurance. It is necessary to provide sufficient insurance against all risks in order to eliminate these problems.

4.2.1. Main Legal Arrangements on Animal Husbandry

Animal Improvement Law (4631): This law includes the issues such as improvement studies to be carried out in order to increase the efficiency of animals bred for the purposes of all kinds of animal production and the activities ensuring the efficiency of this production and for the purposes of breed, competition and service; to protect the gene resources of domestic and wild animals; to ensure the animal production to be economical and to increase competition power; to register the activities related with the subject and pedigree records; to ensure animal improvement and to breed animals in healthy and hygienic conditions and to ensure the protection and delivery of these animals to the producers in a way free of disease.

Rangeland Law (4342): It includes the subjects such as the legal status of pastures, mountain pastures and shelters; determination, limitation and allotment operations of pastures, mountain pastures and shelters, changing the allotment purpose and protection, improvement and management of pastures.

Animal Health and Inspection Law (3285): This law includes the subjects such as importation and exportation places of animals and animal materials, communication in come out of diseases, disease denouncement, general measures to be taken in disease come outs, protection and treatment measures,

transfer and trade of animals and animal materials in the country, struggle with diseases and inspection, examination of animals to be slaughtered, the meat and the animal materials, health inspections in the borders and quarantine measures, health inspection inside the country and quarantine measures and the diseases to be indemnified. The diseases, which are obligatory to be denounced, and the control and struggling studies related with these diseases are reported on this law. According to this law, the diseases, which are obligatory to be denounced are; Bovine pleuropneumonia, Foot and Mouth Disease, Cattle Tuberculosis, Cattle Brucellosis, Bovine Spongiform Encephalopathy (BSE), Infectious Bovine Rhinotracheitis (IBR), Antrax, Rabies, Sheep and Goat Brucellosis, Sheep and Goat Pox, Sheep and Goat pleuropneumonia (PPR), Bluetongue, Equine pleuropneumonia, Ruam, Durine, Infectious Equine Anemia, Vascular Stomatitis, Equine Encephalomyelitis, Poultry pleuropneumonia, New Castle Disease, Pullorum, Poultry Typhus, Scrapie, FSE, American Offspring Bruise in Bees, Varroa, Infectious Hematopoetic Necrosis in Fish.

4.2.2. Regulations

Regulation on Conservation of Animal Genetic Resources

Regulation on Registration of Animal Breeds

Regulation on Establishment of Breeder Unions for Improvement of animals and Services

Regulation on Establishment and Working Procedures of National Committee of Animal Improvement

Regulation on Pedigree and Preliminary Pedigree in Animal and Working Procedures

Regulation on Establishment and Working Procedures of Embryo and Sperma Production Centers

Regulation on Procedures of Artificial Insemination, Natural Insemination, Ovum and Embryo Transfer Activities

Regulation on Private Veterinary Laboratories

Regulation on Establishment – Opening – License – Working and Inspection

Principles and Procedures of Sale, Sheltering and Training of Pets
Regulation on Definition, Registration and Monitoring of Ruminating Bovine Animals
Regulation on Hatcheries and Breeding Enterprises
Regulation on Veterinarian Consulting Rooms and Polyclinics
Regulation on Pedigree Records of Pure Arabic and English Horses

4.2.3. Notifications

Notification on Implementation Procedures of Resolution of Council of Ministers on Supporting Animal Husbandry

Notification on Licensing and Inspection Principles and Procedures of Animal Markets (2000, 2001)

Notification on the Required Documents for Control Certificate Arrangement in Importation of Live Animals and Animal Materials except from Breeding Animals

Residue Norm Notification – Notification on Procedures of Sampling from Veterinary Health Products such as Vaccine-Serum-Diluting Liquid and Biological Materials

Notification on Authorization of Private Veterinarians

Notification on the Conditions Required for Receiving Control Certificate in Importation of Sheep, Body Lipid and Suet.

Notification on the Conditions Required for Arrangement of Control Certificate in Importation of Butchery Live Poultry, Poultry Meat, Viscera and Egg.

Notification on Milk Incentive Premium

Notification on Implementation of Resolution of Council of Ministers on Supporting Mohair Producers and meeting the Necessary Financing for Direct

Payments of Subsidy Premiums from Price stability Fund

4.2.4. Subsidies and Incentives

Subsidy for breeding heifers: Unreturned financial aid is given to the heifers having pure breed certificate and breeding certificate.

AI Subsidy: Financial aid is provided to all cattle included in pedigree system in priority regions with respect to development and for AI activities in rest of the country.

Milk Incentive Premium: Milk incentive premium is paid as to be implemented differently for the milk produced in the enterprises registered in pedigree.

Fodder plants production is subsidized.

Discounted electricity subscription schedule has been started in poultry farmers.

Incentive implementation has been started in exportation of poultry animals.

The Decree on Animal Husbandry Subsidy has been extended and unreturned subsidy has been provided for the breeders having fattening stock in their enterprises.

4.3. Foreign Trade Policies

Although cattle meat and milk were not imported until the year 1980, animal market has been opened to foreign competition after this year. Beginning from 1980, importation of cattle meat has significantly increased due to the insufficient supply to meet domestic demand.

Turkey was the main exporter of Middle East Countries in live sheep and sheep meat until recently. However, the decrease in the number of sheep has slowed down exportation significantly. On the other hand, Turkey had imported breeding animals mainly cow, sheep and other live animals at an unimportant

level until 1987. However, breeding heifer importation has been started after 1987 in order to increase average carcass weight and milk yield in cattle population.

After 1980s, foreign trade regime for breeding animals has included more freedom compared to cattle meat, milk powder and butchery animals. Implementation of tariff and out tariff measures continued until 1995. Restrictions have been brought on importation of cattle meat, butchery and fattening cattle and breeding heifers as of August 1996 due to the animal diseases. Turkey has also supported exportation of animal products in different ways since 1980s. Export subsidies were implemented on exporters in the years 1993 and 1994.

Direct export subsidies were abolished after 1995 in accordance with the provisions of GATT and export subsidies were carried on under the name of “Export Income Return in Agricultural Products”

There are still obstacles in the export of animal products. Generally, these are in the form of “export prohibitions” and “preliminary permissions” The latest export regime was published in the official Gazette dated 6th January 1996. According to this regime, export of Angora Goat is prohibited and export of breeding cattle and sheep is subject to the permission of MARA.

4.4. Current Infrastructure

4.4.1. Condition of National Capacity

Major part of the services and duties related with agriculture is performed by public sector in Turkey. With regard to development needs and increasing demands; MARA conducts researches, prepare plans, programs on the improvement of production, conservation of natural resources such as land, water, plants and animals. In addition, support of animal breeding, control of production and usage of plant and animal drugs, supervision of services related with food and feed; control of animal diseases, provision of agricultural

services and infrastructure and rehabilitation of social and economic services related with agriculture are in the mandate of MARA. Besides, researches on food, determination of food standards and quality criteria, assistance to the implementation and control of these issues, implementation of Turkish Food Codex, inspection of food and feed industries and organization of training programs; performed by MARA.

4.4.2. Information Systems

“Farmer Registration System Project” and Data Base Establishment studies have been started. There is not regular registration system and database on the agricultural sector in Turkey. The studies on transition to registration system and establishment of database have been started throughout the country within the context of “Farmer Registration System and Data Base Establishment Project”. By the help of this, the activities related with agriculture will be recorded. It is estimated that the cost of the project, which will cover all over Turkey, will be approximately 250 million US Dollars.

Animal Health Information System linked with the information systems in the world, has been established and a web page, named www.ahis.gov.tr, has been prepared by General Directorate of Protection and Control of MARA.

The data related with the number of animals and the animal products are collected and evaluated by MARA and SSI.

4.4.3. Research – Improvement Activities and the Relevant Institutional Infrastructure

The researches related with animal husbandry are carried out or supported by ministries, research institutes under the body of universities, Turkish Scientific and Technical Researches Institution (TUBITAK), Turkish Atom Energy Institution (TAEK) and the independent divisions of private sector.

There are five research institutes just work on animal husbandry, five Research

Institutes having animal husbandry research department under their bodies, eight Veterinary Control and Research Institutes, one Poultry Diseases Research and Vaccine Production Unit, one Foot and Mouth Disease Institute and 39 Directorate of Province Control laboratories under the body of MARA. Some of these carry out diagnosis, hormone analyses, chemical and biological examinations as well as vaccine and serum production.

Universities constitute the center of the institutional infrastructure in the field of agricultural biotechnology in Turkey from the aspect of institutions carrying out research and improvement studies.

AI programs are supported by MARA and frozen sperms are produced by Central Livestock Research Institute in Lalahan – Ankara and institutions in Menemen – İzmir and Karaköy-Samsun under the body of the ministry.

There are 35 faculties and 47 colleges under the body of universities carrying out education-training and research activities on animal husbandry.

4.4.4. Non-Governmental Organizations

Non-governmental organizations dealing with Animal Genetic Resources in Turkey are; CBAT, White Meat Industrialists and Breeders Association (BESDBIR), The Association of Dairy, Beef and Food Manufacturers and Producers of Turkey (SETBİR), Scientific Poultry Association, Veterinary Poultry Association, Association of Egg Producers, Association of Western Anatolia Broiler Producers, Feed Industrialists Company (YEMSAN) and the occupational institutions and associations related with Agriculture and Veterinary. Turkish Erosion Struggling, Forestation and Conservation of Natural Values Society (TEMA) and WWFTR indirectly support livestock although their main working field is not animal husbandry.

CBAT was established in 1995. The enterprises, which are members to this association, are provided with pedigree and performance control studies as well as the required services upon entrance fee, annual fee and pedigree service price.

Holstein animals registered in pedigree are given two certificates according to their characteristics,

1. Pure breed certificate (including parent numbers, date of birth and the pedigree number belonging to itself which contains breed, sex and date of birth)
2. Breeding certificate (given to the cattle having breeding value and including milk yield information besides the information, taking place in pure breed certificate). In 1996, 35 576 animals in 1 132 enterprises in 19 provinces were taken under registration; as of the end of the year 2001, the number of provinces reached to 36, the number of enterprises reached to 7 268 and the number of animals registered reached to 175 407.
3. On the other hand, breeders association registers the cattle with preliminary pedigree without considering breed. In the beginning of the year 2002, 512 351 animals in 186 082 enterprises were reached by this practice. Activities such as; yield controls, AI applications and marketing of breeding animals in the member enterprises are carried out by the Central Association of Breeding Cattle Breeders.

4.5. Main Problems

Despite the improvement projects and the subsidies implemented up today, desired development has not been achieved in livestock sector in Turkey. Animal production system still face with the following problems,

- Long-term stable policies on livestock sector could not be implemented in Turkey and appropriate animal production models according to ecology and enterprise structures could not be developed.
- The authorities and responsibilities related with agriculture are given to various institutions, that caused insufficient coordination among them, consequently resulted in weak formation of complementary and permanent agricultural policies.

- Excluding poultry sector, size of the animal husbandry enterprises, are well below the optimum farm size and these are formed as small family enterprises. Technology transfer to these enterprises, which cannot make economical production, is too low and most of these enterprises preserve their conventional structures.
- Input costs are rather high in animal production. Thus, the livestock products have not got compatibility in foreign market and even domestic market is under the threat of imported products.
- Technical knowledge level of producers is too low and there is not an effective extension organization.
- The subsidies provided for animal husbandry is insufficient when compared with other countries and small enterprises cannot benefit from these subsidies adequately.
- A desired integration could not be established between livestock and crop production systems.
- Amount of quality forage produced in Turkey can not meet even half of the requirement. In addition, concentrated feeds could not be reached to a standard quality.
- Meadows and pastures are significantly degraded and they do not have potential to support productive animal husbandry.
- Insufficient organization in animal husbandry constitutes a significant obstacle in policy establishment, input provision, marketing and new technology usage.
- Insufficient animal health and AI services
- Conventional production system based on entirely labor where use of mechanization is limit is not economically sound any more.
- Research and development activities, related with animal husbandry, are insufficient and most of executed projects are not multi-disciplinary problem oriented.
- The producers have not got financial resources to improve their farming systems or to make investments on innovations.

Profitability of animal husbandry depends on considerably on improvement of marketing. There are so many major problems in marketing of the animal products in the country milk in special.

Privatization of state enterprises was started with TSEK, EBK and Feed Processing Industry (YEMSAN) in order to relieve the pressure on public resources in and increase the productivity in the past. Participation of related bodies in the privatization process of state enterprises has not been sufficiently ensured in Turkey. Privatization of three public enterprises mentioned above at the same time caused negative impacts on animal product markets.

It is noticeable that formation of monopoly trends could not be prevented and controlled in the provinces where privatization took place. This condition has negative impacts on marketing of animal products such as; decrease in the supply of quality product with suitable prices in the market. Although amount of the production showed an increase of 120.25% as per laborer employed after privatization, rate of benefiting from annual slaughtering capacity could not be increased. Privatized plants could not be improved to achieve the standard of an integrated plant which includes the product processing units. The state enterprises closed down by means of privatization, caused negative effects on producers and market nearby them; and caused to increase the prices of processed products.

Organization, which would ensure strengthening of producers economically and socially, could not be achieved sufficient stage. However, organization of producers was accelerated by issuing Animal Improvement Law. Furthermore, instability in producers' income decrease the favorability of agricultural production; and this condition accelerates the migration process of the low-income farmers from villages to the cities.

Since the Civil Code in effect requires the equal share of inheritance among the inheritors, it causes the degradation of enterprises continuously. This process causes not only to the degradation of lands but also irregularity in the order of

enterprises. Due to equal sharing of whole property of farms (e.g. equipments and animals) the enterprises become unprofitable.

Chapter 5. Conservation of Animal Genetic Resources

It has been projected to conserve domestic animal species and breeds by GDAR of MARA. According to this, conservation places and methods of eight species, fourteen breeds and three silkworm lines taken under protection are specified in Table – 5.

The project was started in 1995 with the cattle breeds under the high risk of extinction. A committee consisting of the representatives of the related institutions was established in the regions. The project was extended to include species so as sheep, goat, buffalo, poultry and silkworm in years 1996 and 1997; and to include rabbits and bees in year 2000.

Table 5. Animal Species and Breeds under Conservation

Species	Breeds Under Conservation	Conservation Places	Conservation Methods
Cattle	Anatolian Black East Anatolian Red South East Anatolian Red Anatolian Grey	Lalahan Livestock Cent. Research Inst. Doğu Anadolu Agricultural Research Inst. Çukurova Agricultural Research Inst. Marmara Livestock Research Inst.	Ex situ in vivo, in vitro Ex situ in vivo Ex situ in vivo Ex situ in vivo
Buffalo	Anatolian Buffalo	Afyon Agricultural Research Inst.	Ex situ in vivo
Sheep	Kıvırcık Sakız Gökçeada South Karaman	Marmara Livestock Research Inst. Marmara Livestock Research Inst. Marmara Livestock Research Inst. Konya Livestock Research Inst.	Ex situ in vivo Ex situ in vivo Ex situ in vivo, Ex situ in vivo

Goat	Ankara Goat	Lalahan Livestock Cent. Research Inst.	Ex-situ in vivo
Poultry	Denizli Gerze	Lalahan Livestock Cent. Research Inst. Lalahan Livestock Cent. Research Inst.	Ex-situ in vivo, in vitro Ex-situ in vivo, in vitro
Rabbit	Ankara Rabbit	Ankara Poultry Research Inst.	Ex situ in vivo
Bee	Caucasian Bee	Ardahan Beekeeping Production Station	Ex situ in vivo
Silkworm	Hatay Sarısı Bursa Beyazı Bursa Alacası	Silkworm Research Institute Silkworm Research Institute Silkworm Research Institute	Ex situ in vivo Ex situ in vivo Ex situ in vivo

Gazelle (Ex situ in vivo), South Anatolian Red cattle, Angora Goat and dog breeds of Kangal, and Akbash have been taken under conservation in TİGEM Ceylanpınar Agricultural Enterprise.

Ministry of Environment and Forestry has taken under protection 52 of 155 mammal species and 419 of 453 bird species from wild animals. In addition, Caucasian bee in under in situ conservation under the body of the ministry.

Chapter 6. International Cooperation

“Support Project for the Preparation of Provincial and Rural Development Master Plans”, TCP/TUR/8924 was published in the Official Gazette dated 17th August, 1999 and put into effect with the financial contribution of FAO. The project aimed to prepare the necessary guidance for the preparation of Provincial Agricultural Master Plans and to train the project staff to be employed in preparation of these Plans. The objective of the Project is to establish Ministerial Infrastructure relevant to the preparation of Provincial Agricultural Master Plans, and strengthen the implementation capacity to ensure the

preparation of these Master Plans. The long-term target of the Project is to provide sustainable development in agricultural sector, to guide the creation of new income generating activities, to raise the living standard of rural population through the reduction of unemployment and prevention of rural migration. Consequently is to improve capacity building of national academic and educational institutions on agricultural planning by considering the relative superiorities of 81 provinces in natural and human resources potential, infrastructure, transportation to the market and crop and animal production.

Agricultural Agreement purposed the reduction of the subsidies in domestic market and the tariffs at foreign trade 36 % by developed countries and 24 % by developing countries in a period of 6 and 10 years respectively. However, discount was not envisaged to cover certain measures which have no negative affects on trade (such as strengthening of research and health infrastructure, measures for the protection of the environment and improvement of food security services), contrary it was aimed to direct the expenditure towards these activities. Since the amount of the support made by means of subsidy purchases do not exceed 10 % of total agricultural production value in Turkey, domestic subsidies were considered within the context of “de minimis” subsidies and no commitment was made on discount of domestic subsidies. In this framework, Turkey does not have a commitment of decreasing domestic subsidies in the context of GATT until the year of 2004.

Turkey is a member of World Trade Organization (WTO), which was established in 1995 at the end of the multi-lateral negotiations of Uruguay Round. For this reason, Turkey is under several liabilities resulting from Agricultural Treaty, Health and Plant Health Measures Treaty and Treaty of Technical Barriers in Trade. Turkey committed to protect domestic market only with custom taxes in the agreement signed with WTO. Even a tariff which is implemented at the rate of 225 percent on live animals and beef import is insufficient.

Since agricultural structure of Turkey is different from those of EU countries, agricultural products were kept out of the content of Customs Unions in the

Partnership Council Resolution (PCR) dated 6th March, 1995 and numbered 1/95. Processed agricultural products were included so as to modify the share of Industry equal to zero on the customs taxes. As it is known, it was envisaged to improve the preferential regimes provided by the parties to each other on the agricultural products upon the base of mutual benefit in accordance with Articles 22, 24 and 25 of the PCR numbered 1/95.

Economic, Scientific and Technical Cooperation Treaty among the Balkan Countries was signed on 15th September, 2001 by Turkey, Albania, Bosnia-Herzegovina, Bulgaria, Macedonia, Romania and Yugoslavia. As it was defined in Article 1; collaboration is to be realized on; exchange of scientific and technical information, documents, genetic and biological materials, information on the developments in scientific areas. Mutual visits between experts, researchers and consultants; organization of training programs, seminars, conferences and meetings in the countries, establishment of Joint scientific centers or institutes for field implementations, multi-lateral cooperation with other countries, European Union and International institutions for the development of production and marketing systems and encouragement of joints investments between the public and private sectors should be accomplished.

Turkey has put forth its demand to cooperate with Azerbaijan, Turkmenistan and Kyrgyzstan in the field of agriculture and rural development within the framework of South-South Cooperation Program of FAO with the project of “Capacity Improvement of Agricultural and Rural Sector Policy Elements of Caucasus and Central Asia Countries”. Project preparation committees from Turkish Government and FAO have visited these countries together and prepared the relevant projects.

It is in the scope of Turkey to have a significant and leading role in agricultural products trade of the world. According to the basic animal products main projections can be made as follows; beef production is estimated as 611 000 tons and consumption as 895 000 tons; lamb production as 315 000 tons, consumption as 296 000 tons; poultry meat production as 1 025 000 tons, consumption as 1

020 000 tons, egg production as 881 000 tons, consumption as 878 000 tons, milk production as 8 827 000 tons, consumption as 8 061 000 tons by the end of the coming 5 years.

The negotiation proposal, determined at the end of Uruguay Round considering the changes occurred in the structure of agricultural production and export of Turkey, was published as a WTO document dated 5th February, 2001 and numbered G/AG/NG/W/106 and submitted to the Agricultural Committee of WTO at the meeting on 22-23 March 2001.

Turkey has signed Convention of Biologic Diversity (CBD), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and Convention on the Conservation of European Wildlife and Natural Habitats in relation to the Conservation of Animal Genetic Resources.

6.1. Country Priorities Related With Animal Genetic Resources

- The most important problem is the insufficient information in every field of animal husbandry in Turkey. For this reason, a comprehensive inventory study which may cover all aspects of livestock sector should be initiated to alleviate information gap.
- Most of the efforts up to now, aimed to increase the production have been concentrated on the improvement of breeds. Improvement of feeding and management condition somehow ignored. Rehabilitation of environmental conditions and management practices is a prerequisite for the establishment of productive livestock farming systems. Thus, primarily these aspects should be taken into account in animal production and consequently improvement of living standards of livestock farmers.
- Animal breeding programs should consider; geographical, climatic, socio-economic and cultural diversity of Turkey and determine traits of the breeds according to priority of the regions.
- Current activities on conservation of domestic animal genetic resources should be expanded and diversified; an in-vitro gene bank should be

established for this purpose.

- In conservation program special emphasis should be given to the determination and isolation of genes, which control certain characteristics of animals such as resistance to disease, quantity and quality of production.
- Future studies should be intensified on the minimization of negative effects of animal diseases and pests, enhancement of production capacity and quality of vaccine, drugs and serums and improvement of the inspection standards of imported animal health materials.
- In order to encourage the expansion of pure-bred animal rearing farms, development of contract breeding systems with public and private sectors, provision of technical assistance at distribution and marketing of breeding animals should be provided by the government.
- Pure-bred animal rearing farmers should be encouraged to establish cooperatives, farmers' union.
- Farmers should be encouraged to participate in the activities within the scope of improvement of agricultural infrastructure in compliance with environment focusing on conservation of natural resources.
- To meet the high quality raw material demand of the industry to increase red meat and milk production, in addition to cattle, special emphasis should be given to production improvement studies of meat and milk type sheep, goat and buffalo breeding programs. Through the improvement of poultry production, consumption and export of broiler, turkey and duck meat as well as egg should be encouraged.
- Direct financing of rural development projects, based on farmers' active participation and responsibility, should be expanded.
- Integration of livestock and crop production should be improved. To increase the compatibility of processing industry and quality raw material requirement should be accomplished.
- The position of biotechnology should be defined as independent and prioritized implementation area. Bio-information system, which showed a similar development with molecular biology in the past half-century,

represents a field on which Turkey is obliged to move immediately. The ability on the utilization of technological opportunities of molecular biology in order to protect biological richness should be gained. Considering the patent monopolies occurred against commercialization process of biological information; the framework of the legal arrangements for the implementations related with biotechnology in the country should be prepared. Health and environmental protection problems should be discussed.

- It is of importance for enhancement of concentrate feed and forage production, improvement of pastures and extension services, expansion of fodder crops acreage which currently constitute only 3-3,5% of arable lands.
- An effective legal and organizational framework should be developed for Agricultural Research Institutions, besides an influential collaboration should be established among the research programs, carried out by various institutions and universities.

6.2. Recommendations:

The appropriate research results, which have been produced in developed countries and aimed reduction of production costs, improvement of production efficiency and minimization of losses in agriculture and agricultural industry, should be transferred to the developing countries, by means of bilateral or multilateral collaborations. The use of high-tech communication can easily facilitate the information exchange.

In order to strengthen regional cooperation and ensure the effective control of Foot and Mouth Disease, It would be beneficial for the European Union as well as the Central and Near East Countries to establish a “Middle East Commission on Struggling with Foot and Mouth Disease”. In coordination with European Union Turkey has initiated a project to prevent incidence of foot and mouth disease. However, due to insufficient financial resources some problems arose at

the implementation stage of the project. Provision of financial support is vital for the enforcement of project activities and success of the project.

Bilateral or regional cooperation should be developed on the exchange of experiences and information such as; research results, protective animal health, disease control measures, AI and embryo transfer techniques, pedigree, labeling and recording systems, exchange of experts, assessment of inactive capacity, prevention and eradication of infectious animal diseases; cooperation against the entrance and expansion of epizootic diseases, development of joint studies between the related research institutions, provision of genetic material for researches, staff training, encouragement of cooperation and investments between the public and state enterprises and exchange of information and experiences in professional training.

ABBREVIATIONS

BESDBIR: White Meat Industrialists and Breeders Association

CBAT: Cattle Breeders Association of Turkey

CBD: Convention of Biologic Diversity

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora

EBK: Meat and Fish Agency (privatized)

EFTA: European Free Trade Association

FAO: Food and Agriculture Organisation of the UN

FEOGA: Fonds Europeen D'orientation et de Garantie Agricole

GATT: General Agreement on Tariffs and Trade

GDAE : General Directorate of Agricultural Enterprises

GDAPD : General Directorate of Agricultural Production and Development

GDAR: General Directorate of Agricultural Research

GDPC: General Directorate of Protection and Control

MARA : Ministry of Agriculture and Rural Affairs

SETBIR: The Association of Dairy Beef and Food Manufacturers and Producers in Turkey

SIS : State Institute of Statistics

TCZB: Agricultural Bank of Turkish Republic

TEMA: Turkish Foundation for Erosion Control, Reforestation and Protection of Natural Habitats

TKK: Agricultural Credit Cooperatives

TSEK: Dairy Industry Agency of Turkey (privatized)

TUBITAK: Scientific and Technical Research Association of Turkey

UNIDO: United Nations Industrial Development Organization

WTO: World Trade Organization

WWFTR: The Conservation Organization

YEMSAN: Feed Industry Company

YÜNSA: Mohair and Wool Agricultural Sale Cooperatives

YÜNYAP: Wool and Mohair Turkish Inc

Appendix 1: State of farm animal genetic resources

		Widely Used	At Risk	Others (no info)	Lost (last 50 yr)
CATTLE					
Yerli Kara (Anatolian Black)	L		X		
Doğu Anadolu Kırmızıısı (East Anatolian Red)	L		X		
Boz ırk (Turkish Grey)	L		X		
Kilis	L		X		
Zavot	L		X		
Kultak	L		X		
Halep	L				X
Dörtyol	L				X
Kafkasya (Caucasus)	L				X
Malakan	L				X
Kırım	L				X
Seferihisar	L				X
Diyarbakır	L				X
Eleşkirt	L				X
Karaisalı	L				X
Karacadağ	L				X
Kıbrıs	L				X
Çukurova	L				X
Urga Sığırı	L				X
Siyah (Kalmuk)	L				X
Maraş	L				X
Holstein Friesian	E	X			
Brown Swiss	E	X			
Simmental	E	X			
Jersey	E	X			
Anatolian Brown	L	X			
Anatolian Black Pied	L	X			

		Widely Used	At Risk	Others (no info)	Lost (last 50 yr)
BUFFALO					
Anatolia	L		X		

SHEEP					
Akkaraman (White Karaman)	L	X			
Morkaraman	L	X			
Kangal Akkaraman	L	X			
South Karaman	L		X		
Dağlıç	L		X		
Ivesi (Awassi)	L	X			
Karayaka	L	X			
Kıvırcık	L		X		
Sakız (Chios)	L		X		
Gökçeada	L		X		
Karagül	E				X
Herik	L		X		
Turkish Merino (Karacabey)	L	X			
Anatolian Merino	L	X			
Tuj (Tushin)	L		X		
Hemşin	L		X		
Ödemiş	L		X		
Halkalı	L				X
Karakaçan	L				X
Karakaş	L		X		
Norduz	L		X		
Malya	L	X			
Tahirova	L	X			
Ramlıç	L			X	
Çineçaparı	L		X		

		Widely Used	At Risk	Others (no info)	Lost (last 50 yr)
GOAT					
Angora Goat	L		X		
Kıl Keçisi (Native Hair Goat)	L	X			
Malta	L		X		
Gürcü	L		X		
Kilis	L	X			
Norduz	L		X		
Saanen	E	X			

CHICKEN					
Denizli	L		X		
Gerze	L		X		
Sultan	L			X	
Hacıkadın	L			X	
TURKEY					
Native	L	X			
RABBIT					
Angora	L		X		
New Zeland	E	X			
DUCK					
Native	L	X			
Pekin	E	X			
GOOSE					
Native	L		X		

		Widely Used	At Risk	Others (no info)	Lost (last 50 yr)
HORSE					
Anatolia	L		X		
Çukurova	L		X		
Uzunyayla	L		X		
Canik	L		X		
Gemlik	L		X		
Malakan	L		X		
Hınıs Kolu Kısası	L				X
English	E	X			
Arabic	E	X			
Haflinger	E		X		

DOG					
Akbaş Turkish Shepherd Dog	L	X			
Kangal Turkish Shepherd Dog	L	X			
Kars Turkish Shepherd Dog	L		X		
Turkish Greyhound	L		X		
Çatal Burun Hunting Dog	L		X		

DONKEY					
Merzifon	L		X		
Karakaçan	L		X		

L: Locally adapted or native

E: Exotic