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# Current state of the mixed-feed manufacturing in Turkey in relations with livestock and poultry sectors and raw material supply position

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**SUMMARY -** In this paper the livestock and mixed-feed manufacturing sectors in Turkey are presented. The total number of head of cattle in 1997 was 11,700,000, with a production of 588 mtons and a consumption of 9.7 kg *per capita*. Figures for sheep are 41,300,000 head, meat production 369 mtons and 5.9 kg consumption *per capita*. For broiler meat there was a production of 535 mtons and 8.3 kg consumption *per capita*. Total mixed feed production in 1997 was 4,829 thousand mtons, 2,213 of which are destined to poultry and 2,585 to cattle and sheep. The projection of feed production for the year 2000 is 5,978 mtons. The number of feed mills in 1996 was 362, with a capacity of 9,200 mtons per year. Turkey has been producing a substantial amount of feed grains and oilseeds necessary for its mixed-feed production, however in 1996, the imported raw material for total feed production increased to 31% in volume (1,400,000 mtons) while this ratio in poultry feed is 65% (1,300,000 mtons).

**Key words:** Mixed-feeds, Turkey.

***RESUME -*** *"Situation actuelle de la fabrication d'aliments composés en Turquie concernant les secteurs du bétail et de la volaille et position de l'approvisionnement en matières premières". Cet article présente les secteurs de l'élevage de bétail et de la fabrication des aliments composés en Turquie. Le nombre total de têtes de gros bétail en 1997 était de 11 700 000, avec une production de 588 mtonnes et une consommation de 9,7 kg par habitant. Ces chiffres sont pour les ovins de 41 300 000 têtes, la production de viande de 369 mtonnes et la consommation par habitant est de 5,9 kg. Pour la viande de poulet, il y a eu une production de 535 mtonnes et une consommation de 8,3 kg par habitant. La production totale d'aliments composés en 1997 a été de 4 829 milliards de tonnes, dont 2 213 sont destinés aux volailles et 2 585 aux bovins et ovins. La projection de la production d'aliment bétail pour l'an 2000 est de 5 978 mtonnes. Le nombre d'usines d'aliments composés en 1996 était de 362, avec une capacité de 9 200 mtonnes par an. La Turquie produit dernièrement une quantité substantielle de céréales et graines oléagineuses nécessaires pour la production d'aliments composés, mais cependant en 1996, les matières premières importées pour la production totale d'aliment bétail ont augmenté de 31% en volume (1 400 000 mtonnes) tandis que ce rapport est de 65% pour l'aliment volailles (1 300 000 mtonnes).*

***Mots-clés :*** *Aliments composés, Turquie.*

## Turkey's geographical location on the world and relation with other countries

Turkey has a great agriculture production potential arising from her ecological and climatic conditions, land property and rich crop-pattern. Due to the these factors, Turkey is one of the most favoured countries in terms of agricultural and farmed animal production. Moreover, the country's strategical location offers the advantages of overland transport to both eastern Europe and the Middle East as well as sea lanes to Russia and Mediterranean countries (Table 1).

## Livestock and poultry

In order to have an idea about the current state of mixed feed production in Turkey, live stock and poultry sectors should be understood first.

Table 1. Turkey's key figures

| | |
|---|---|
| Population: | 63 millions<br>60% in urban<br>40% of total population live in rural areas<br>Growth rate: 1.9% yearly |
| Land: | 780,580 squared km mostly mountainous terrain<br>with a high terrain with a high central<br>Plateau in the interior<br>21 million ha are cultivated<br>30% of the area is arable land |
| Economy: | Basically market economy |
| Growth rate: | 5% over the past decade |
| Composition of GPD: | Industrial production 28% in 1996<br>Agriculture 15%<br>Services 57% |
| Exports: | US $ 26.0 billions in 1997 |
| Imports: | US $ 46.7 billions in 1997 |
| Gross domestic product *per capita*: | US $ 2,900 in 1996 |
| Currency: | 1 US $ = TL 235,000 in the middle of March 1998 |
| Inflation: | 99% in 1997 |
| Devaluation rate: | 95% in 1997 |
| Bank loan interest: | 7-8% monthly |

## Livestock in Turkey

The live stock and dairy sectors have been relatively static in recent years. The number of beef cattle and dairy cattle are around 12 millions and number of sheep has reduced to around 40 millions. Turkey's beef, veal and sheep meat production is around 950,000 Mtons recently.

Historically, Turkey's agricultural policy has favoured the production of field crops for export, rather than for livestock production. Additionally, until the last decade, Turkey's import policy did not encourage the introduction of new technologies. As a result, The Turkish live stock industry has been slow to modernize and currently suffers from a number of problems, including low meat and milk yields, a high incidence of disease and mortality, a low fertility rate and poor nutrition. Most production continues to occur on small, inefficient farms with average herd size of five head for cattle and about fifty heads for sheep

However, most industry observers believe the decline in cattle and sheep numbers has stabilized and could begin to increase from their present low levels by new investments in the sector.

In spite of current situation, high breed cattle population tend to increase. This will cause high energy and protein feed to be used more. Thus mixed feed usage will increase in cattle nutrition.

On the other hand, sheep are generally grazed on public lands and provided little or no additional supplements. Grazing-land and coarse feed will be insufficient in the future because of the contraction of lands and over-grazing. The trend from extensive live stock rearing to intensive rearing will also increase mixed feed consumption in the following years.

Tables 2 and 3 show the number of animals and meat production in the past six year.

Table 2. Cattle meat in Turkey

| Years | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|
| Inventory (000 heads) | 12,000 | 11,900 | 11,800 | 11,700 | 11,700 | 11,700 |
| Slaughter (000 heads) | 4,400 | 4,350 | 4,250 | 4,450 | 4,250 | 4,200 |
| Beef and veal prod. (000 MT) | 295 | 292 | 286 | 623 | 595 | 588 |
| Beef and veal imp. (000 MT) | 30 | 32 | 9 | 50 | 12 | 10 |
| Beef and veal exp. (000 MT) | 0 | 1 | 0 | 0 | 0 | 0 |
| Beef and veal con. (000 MT) | 312 | 318 | 310 | 630 | 600 | 610 |
| *Per capita* (kg) | 5.2 | 5.2 | 5.0 | 10.1 | 9.7 | 9.7 |

Source: USDA statistics

Table 3. Lamb, mutton and goat meat in Turkey

| Years | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|
| Inventory (000 heads) | 44,700 | 44,600 | 44,000 | 43,000 | 42,400 | 41,300 |
| Slaughter (000 heads) | 24,100 | 24,100 | 23,700 | 23,300 | 23,900 | 23,500 |
| Meat prod. (000 MT) | 378 | 378 | 372 | 366 | 375 | 369 |
| Meat imp. (000 MT) | | | | | | |
| Meat exp. (000 MT) | 5 | 4 | 8 | 4 | 2 | 3 |
| Meat con. (000 MT) | 365 | 375 | 365 | 368 | 375 | 370 |
| *Per capita* (kg) | 6.1 | 6.2 | 5.9 | 5.8 | 6.0 | 5.9 |

Source: USDA statistics

## Poultry meat in Turkey

The broiler industry, on the other hand, continues to grow. Total poultry meat production for 1997 is realized as about 525,000 Mtons.

Chicken industry depending on white meat consumption will have a higher share in the development of mixed feed consumption in the coming years than the live stock sector.

Large scale commercial broiler production is a relatively recent phenomenon in Turkey. As a result, the industry is a modern one, developed mainly along US lines.

Broiler production is forecasted to continue for the foreseeable future. This expansion is fueled by increased production efficiency combined with people's increasing purchasing power, knowledge, and changes in their live styles and escalating prices for red meat.

The high cost of feed is a major constraint to a faster expansion of broiler industry.

Poultry imports are not possible by tariff barriers. Exports are at minimal level due to the high production costs.

Total poultry consumption in Turkey including the meat from old layers and village flocks is low and averaging about 9 kg *per capita* per year recently. Industry analysts, however, estimate a long-term growth in consumption at about 10-15% annually.

The lower price of poultry meat, compared to red meat is the major factor responsible for increased poultry consumption. Health consideration and market promotion campaigns also are becoming more and more influential. The second reason is that increased integration and competition has resulted in more efficient poultry production and lowered production costs relatively.

Table 4 shows yearly broiler meat production in the recent years.

Table 4. Broiler meat in Turkey

| Years | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|
| Production (000 MT) | 284 | 330 | 350 | 330 | 390 | 480 | 535 |
| Exports (000 MT) | 1 | 1 | 1 | 12 | 5 | 10 | 10 |
| Consumption (000 MT) | 283 | 325 | 350 | 320 | 383 | 469 | 525 |
| *Per capita* (kg) | 5.0 | 5.6 | 5.9 | 5.3 | 6.2 | 7.6 | 8.3 |
| Population (mill.) | 57.0 | 58.2 | 59.4 | 60.5 | 61.7 | 62.0 | 63.0 |

Source: USDA statistics

## Turkish mixed feed industry

When we consider the current global position of our feed sector on the World, Turkey's feed market is one of the growing markets characterized by increasing population with more younger people and an increasing demand for meat and meat products.

The existing domestic situation coupled with the unsaturated markets surrounding the country presents a growth potential for the domestic and export markets.

The same vision recently must have been also shared by the world giants in the sector as an American company "Purina" and a Thai company "C.P. Group" have already invested in Turkey as a part of their expansion strategy.

Both these foreign companies have contributed to Turkey considerably by increasing the efficiency in the sector observed in meat production per consumed feed amount.

## Establishment of the sector

The importance of feed industry which constitutes a bridge between agricultural products and animal production was also noticed in Turkey just after the second World war.

The first feed mills in Turkey was established by a government-owned company opening 4 feed mills between the years 1956-60. Good results achieved encouraged both this state-owned company and private sector to invest more in this business later on.

After years of direct government involvement, Turkey's feed industry today is privately owned and operated as of 1994 after the government's sale of totally 26 state-owned feed mills throughout the country to the private sector. So, the number of private feed mills has increased to 351 in number after the addition of these state-owned ones in recent years.

Number of feed mills and capacities have developed quickly since 1960. Now Turkey has 362 feed mills with 9,200,000 Mtons/year capacity (Table 5).

Table 5. No. of feed mills and capacities in Turkey

| Year | No. of feed mills | Capacity (000 MT/year)[†] |
|---|---|---|
| 1990 | 271 | 5,277 |
| 1991 | 289 | 7,036 |
| 1992 | 294 | 7,172 |
| 1993 | 304 | 7,472 |
| 1994 | 351 | 8,330 |
| 1995 | 351 | 8,980 |
| 1996 | 362 | 9,200 |

[†]Capacity is in mash feed and in one shift
Source: State Planning Organization and Turkish Feed Manufacturers' Association

The mix feed production has followed the capacity increases in feed mills over the years as is shown in Tables 6 and 7.

Out of 362, top 24 feed mills produced 44% of total feed tonnage, 58% of total poultry feed and 32% of total cattle and sheep feed.

The most of these feed mills producing poultry feeds for broilers, breeders, and layers are a part of integrated operations.

## Status of the sector

The Turkish feed industry continue to expand with the new trends. The major change is from a mostly commercial feed industry-producing only feed for sale -to an integrated feed industry -integrated primarily with broiler meat and egg production.

The trend toward integration and production by contract farms in broilers is changing other segments of the Turkish feed industry as well. We are observing the emergence of the four main groups of feed manufacturers:

(i) Commercial feed manufacturers producing mostly ruminant feeds and also producing some feeds for layers, broilers and breeders as supplement.

(ii) Integrated companies producing 100% poultry feeds for themselves.

(iii) Integrated-commercial feed manufacturers serving ruminant sector and semi-integrators.

(iv) Specialty feed producers such as aquafeeds, petfoods and specialty feeds.

Poultry feed in the total feed production is around 45% and cattle is 55%. Each year poultry feed in total production continues to have a higher percentage.

A high number of cattle are not fed mixed feed. If cattle and sheep in Turkey were fed by mixed feed in a proper way to have the optimum efficiency, the potential demand is estimated to be around 10 millions tons of mixed feed per year. In the poultry the realized demand is real demand because almost all commercial poultry operations are using mixed feed. Actually that shows that Turkey's feed need is almost twice the existing figure. Developments in the next decade will increase *per capita* income of Turkey and this will give rise to consumption of more animal products, which means a higher mixed feed production.

Feed mill's capacities are between 5 tons/hr to 60 tons/hr. The majority of the feedmills' contribution is quite limited. Almost 10% is producing 50% of the total output.

Table 6. Mix feed production (000 MT) in Turkey

| Years | Poultry | Cattle and sheep | Others | Total |
|---|---|---|---|---|
| 1989 | 1,324 | 2,940 | 22 | 4,286 |
| 1990 | 1,416 | 2,537 | 23 | 3,976 |
| 1991 | 1,495 | 2,272 | 22 | 3,789 |
| 1992 | 1,619 | 2,687 | 18 | 4,324 |
| 1993 | 1,744 | 2,843 | 19 | 4,606 |
| 1994 | 1,697 | 2,343 | 27 | 4,067 |
| 1995 | 1,715 | 2,772 | 26 | 4,513 |
| 1996 | 2,012 | 2,463 | 28 | 4,503 |
| 1997 | 2,213 | 2,585 | 31 | 4,829 |

Source: State Planning Organization and Turkish Feed Manufacturers' Association (1997) estimated

Table 7. Major feed mills in Turkey and their production in 1997 (000 MT)

| Manufacturer's name | Poultry feed | Cattle, sheep and others | Total |
|---|---|---|---|
| C.P. Group | 216 | 116 | 332 |
| Koytur | 255 | - | 255 |
| Banvit | 153 | - | 153 |
| Ozlem Yem | 140 | - | 140 |
| Abalioglu Yem | 42 | 94 | 136 |
| Ozhen | 69 | 40 | 109 |
| Purina | 7 | 83 | 90 |
| Mudurnu | 85 | - | 85 |
| Pinar Yem | 19 | 65 | 84 |
| Emek Yem | 21 | 60 | 81 |
| Bey Yem | 73 | 5 | 78 |
| Balyem | 17 | 50 | 67 |
| Keskinoglu | 63 | 63 | 63 |
| Esyem | 11 | 50 | 61 |
| Poyraz Yem | 6 | 33 | 39 |
| Hatap Yem | 22 | 16 | 38 |
| Kayseri Yem | 25 | 13 | 38 |
| Orucoglu | 22 | 15 | 37 |
| Elibol Yem | 9 | 26 | 35 |
| Saf Yem | 2 | 31 | 33 |
| Bandirma Yem | 17 | 16 | 33 |
| Matli Yem | - | 31 | 31 |
| Uzyem | - | 25 | 25 |
| Adana Yem | 5 | 18 | 23 |
| Total | 1,279 | 850 | 2,129 |
| % of Turkey (1996) | 58 | 32 | 44 |
| Total of Turkey | 2,213 | 2,616 | 4,829 |

Source: Private studies

Most of the higher capacity ones are semi-automatic and equipped with both imported and local machinery and equipments. The new and renovated feed mills have pelleting lines and pellet output comprises up to 90% of their production. Some of these plants have full automation PLC systems including automated pelleting lines. Most, however, have semi-automated systems with the automation concentrated in proportioning and mixing systems.

Higher cost of feed is a major constraint to the expansion of sector. As an example, broiler feed cost in Turkey is about double those in the United States. Feed costs are high for three interrelated reasons: (i) Turkey's domestic agricultural production policy support crops at prices generally above world prices; (ii) production policy does not favour the production of poultry feed raw materials (mainly corn and soybean) in competition with other more attractive crops (i.e., cotton); and (iii) import barriers to protect domestic production make imports expensive.

Raw material dependency on import makes especially the poultry feed sector more vulnerable to fluctuations in raw material prices and feed prices can not be maintained stable (Table 8).

Table 8. Projections of feed production (000 MT)

| Years | Poultry feed | Cattle and sheep | Others | Total |
|---|---|---|---|---|
| 1996 | 2,012 | 2,462 | 28 | 4,500 |
| 1997 | 2,213 | 2,585 | 31 | 4,829 |
| 1998 | 2,434 | 2,714 | 34 | 5,182 |
| 1999 | 2,677 | 2,850 | 37 | 5,564 |
| 2000 | 2,945 | 2,992 | 41 | 5,978 |

Source: Forecast

Besides some main ingredients, expensive items such as fish meal, vitamins, minerals and medicine have to be imported as well.

Sometimes, low quality feed producers are creating unfair competition in the sector.

Recently, more qualified people have been employed and technical services to the customers have been improved.

Training, fair and seminar activities have given access to international developments.

A 10% of growth for poultry and 5% of growth for cattle are foreseen for feed in the coming years.

## Raw material in feed industry

Turkey has been producing a substantial amount of feed grains and oilseeds necessary for its mixed feed production (Table 9).

But, Turkey's agricultural imports recently started increasing as observed especially in the imports of corn, soybean and soybean meal required by the poultry sector (Table 10).

The long term trend in area planted to grain in Turkey is remarkably flat. Total area planted to grain is 9 millions hectares.

A pattern of steadily increasing consumption of grains, particularly feed grains makes the grain production in Turkey appear to be stagnant.

The imported raw material in total feed production increased to 31% in volume and the quantity has reached 1,400,000 Mtons while this ratio in poultry feed is 65% and the quantity has reached 1,300,000 Mtons in 1996.

Table 9. Feed raw materials production in Turkey (000 MT)

| Years | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|---|
| Wheat | 20,000 | 20,400 | 19,300 | 21,000 | 14,700 | 15,500 | 16,000 | 16,000 |
| Barley | 7,300 | 7,800 | 6,900 | 7,500 | 6,500 | 6,900 | 7,200 | 7,200 |
| Corn | 2,100 | 2,180 | 2,225 | 2,350 | 1,700 | 1,800 | 2,100 | 2,400 |
| Rye | 240 | 256 | 230 | 240 | 240 | 240 | 245 | 250 |
| Oat | 270 | 255 | 240 | 245 | 245 | 245 | 275 | 275 |
| Sunflower | 860 | 800 | 950 | 970 | 700 | 750 | 570 | 700 |
| Cotton seed | 1,047 | 924 | 981 | 870 | 1,250 | 1,263 | 1,100 | 1,100 |
| Soybean | 162 | 110 | 95 | 90 | 75 | 75 | 65 | 65 |
| Sunflower meal | 387 | 360 | 427 | 437 | 348 | 480 | 450 | 475 |
| Cotton seed meal | 423 | 416 | 441 | 392 | 560 | 545 | 475 | 475 |
| Soybean meal | 130 | 88 | 76 | 72 | 75 | 80 | - | - |
| Fulfat soybean | - | - | - | 48 | 63 | 148 | 180 | 200 |
| Wheat bran | 1,620 | 2,000 | 2,040 | 1,930 | 2,100 | 2,170 | 2,250 | 2,250 |
| Molasses | 459 | 597 | 650 | 636 | 687 | 700 | 700 | 1,030 |
| Fish meal | - | - | 12 | 10 | 2 | 3 | 2 | 3 |

Source: State Planning Organization and USDA statistics after 1994 and some estimations

Table 10. Imported feed raw materials in Turkey (000 MT)

| Years | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|---|
| Corn | 519 | 76 | 140 | 100 | 537 | 900 | 600 | 700 |
| Sorghum | 25 | 114 | 105 | 268 | 4 | - | 12 | 40 |
| Tapioca | 200 | 183 | 301 | 189 | 9 | - | 16 | 50 |
| Soybean | - | - | - | 157 | 180 | 220 | 230 | 240 |
| SBM | 42 | 194 | 283 | 224 | 240 | 250 | 280 | 300 |
| CSM | 52 | 11 | 65 | 7 | 10 | 10 | - | - |
| SFM | 14 | 43 | 72 | 14 | 63 | 92 | 10 | 10 |
| Fish meal | 35 | 23 | 27 | 20 | 28 | 30 | 35 | 35 |
| Wheat bran | - | - | 57 | 13 | 6 | 70 | 1 | - |

Source: State Planning Organization and USDA statistics after 1994 and some estimation

Favourable crushing margins, low import duties and lack of sufficient domestic production recently have led to a significant increase in oilseed imports

Turkish Grain Board and some semi-government institutions once were the sole procurers regulating grain and oilseed purchases from farmers and were supplying these items to related sectors all over the year. Now although the ministry of agriculture still sets support prices, the private sector has assumed a larger share of trading and is permitted to import for a couple of years.

Total Turkish 1997 oilseed production, which consists mainly of sunflowers and cotton seeds is currently estimated at about 1.8 millions tons.

There currently are no effective price support policies for the Turkish oilseeds market. Although there has been a general downward trend in production of sunflowers, overall oilseeds production is expected to increase in the next five years, with the expansion of irrigated cotton production in the Southeastern Anatolia project area.

## Future prospects of feed sector in relation with Turkey' agricultural output, livestock and poultry sector

As the importance of mixed feed is being understood more and more by Turkish people, the potential demand for mixed feed will come out and Turkish feed sector will continue to upgrade along with other developments in red and white meat consumption observed in additional investments from large integrated operations that include a number of foreign firms as well. With the introduction of new technologies for animal and feed production, Turkish feed industry is very likely to maintain its upward momentum during the next decade.

Turkish feed sector in its endeavour to grow has many constraints as well as some advantages.

The country has basically reached a production plateau in the production of agricultural goods, which will be difficult to surpass without fundamental changes, because the agricultural lands are not used efficiently enough, new industrial investments are occupying fertile lands, people are moving to big cities and the environment is gradually polluted. The constant contraction of lands prevents the use of agricultural technologies. In addition to the land becoming smaller and dispersed, its use for many years also has a negative impact in the quality of the products. An added factor in the decline in agricultural production has been the inconsistency in the agricultural policies.

Low capacity utilization in the sector increases the unit cost making the competition more difficult in the world market.

Government policies for grain, oil seeds, live stock and poultry and foreign trade regulations must be designed so as to create an harmony with each other to have an upward movement.

On the other hand, experts assert that Turkey's ecology is convenient to grow more grains. A basic increase in agricultural output is expected after the completion of southeastern Anatolian project. The main crop in the project will be cotton but feasibility studies are being conducted on the other oilseed crops as well as grain.

Because of strong domestic potential demand for animal products, the large and efficient private sector's dairy, beef and poultry operations are expected to continue to expand in the coming years by the governments' generally protective import policy toward these products.

The more modern and efficient dairy and meat producing operations are expected to move more increasingly to mixed feed formulas.

Turkey's geographical location offers the advantages to build trade with the emerging market economies of Balkan countries and the former Soviet Union's countries.

In spite of some constraints, all the other positive factors underline the optimism of the Turkish feed industry and contribute to the current growth in feed and animal production basically driven by strong domestic market.