
Animal Recording in Turkey with Special Reference to Sheep Recording

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Objective orientated animal recording is the key for efficient livestock improvement (Pollott, 1995). However, due to the extensive, primitive, traditional, low-input-low income nature of livestock production in Turkey, farmers ignored the importance or essence of recording. It still is looked upon as something useless by the farmers. Therefore there has been very negligible amount of genetic improvement in almost every species and breeds in the last century.

In Turkey animal recording is practised in the universities, agricultural research centres and the state farms, disregarding species. However, most of this recording is for fulfilling the formalities in the case of the state farms and research centres rather than evaluating the collected data for specific breeding objectives. The same holds true for the university research units because most of the work is conducted for fulfilling the thesis or desertation requirements. Moreover, in all of these institutions, there is excessive amount of recording which creates a big financial burden on the limited budgets of the institutions concerned (Gürsoy *et al.*, 1996).

There is practically no breeding organisation to promote recording and utilise data for breed improvements (Yalçın, 1986; Kaymakçý and Sönmez, 1996). Hence Turkish livestock sector is fairly virgin regarding animal recording in low input-low income farms. Recently there are some efforts by foreign funded projects which are organising and assisting the modern pure-bred dairy cattle (specifically Holstein Friesian) farmers to establish an information system and a breeders union for the genetic improvement as well as other expected benefits.

The objective of this paper was to describe the situation of animal recording in Turkey and propose some simple procedures for improving the so called "primitive breeds" which possess promising variation for efficient selection programs.

Agriculture has a share of 15% in the GNP and of this 30% is contributed by the livestock sector. Where as it is over 50% in most of the developed countries of the west. The share of farms engaged in both livestock and plant production is 96.4% of the 4 million agricultural enterprises. The

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ratio of the farms engaged only in livestock production is 3.6%. Approximately 65% of the farms possess cattle and 35% small ruminants. Mean cattle, sheep and goat farm sizes are approximately 4, 39 and 27 heads respectively.

With the exception of the modern dairy farms and feed-lots, most of the livestock production has a very traditional extensive nature (Yalçın, 1986). Feeding of these ruminants is primarily based on grazing the communal range lands, marginal lands, stubbles, fallow areas and also maqie and forests almost all year round. They are housed during the harsh winter days and supplemented with cereal straw and some grains. Almost all the breeds within the sheep, goat and cattle species are highly seasonal in mating and parturition (lambing, kidding and calving). They are the product of thousands of years' of natural selection and are fairly low producers, but very hardy to adverse climatic and nutritional conditions, very resistant to diseases and parasites (Table 1).

Table 1. Livestock statistics by species (000).

Years	Cattle	Sheep	Goat	Buffalo	Camel	Pig
1980	15 894	48 630	19 043	1 031	12	13
1985	12 466	42 500	13 336	551	3	8
1990	11 377	40 553	11 942	371	2	12
1995	11 789	33 791	9 111	255	2	5

Source: State Institute of Statistics 1995.

It is clearly seen that between 1976 and 1995 cattle, sheep, goat, buffalo, camel and pig populations decreased by 25.8 %, 30.5%, 52.2%, 75.3%, 83.3% and 61.5% respectively. In the case of cattle, its contribution to total milk production increased from 58.7 to 87.5% between 1980 and 1995 where as the shares of sheep, goat and buffalo milk production decreased by 53.7, 78.0, and 79.2% respectively (Table 2).

Table 2. Milk production by species (000 ton).

Years	Cattle	Sheep	Goat	Buffalo	Total
1976	3 100	1 004	623	278	5 279
(%)	(58.7)	(19.0)	(11.8)	(5.3)	(100.0)
1980	3 421	1 147	632	274	5 474
1985	7 994	1 073	363	240	9 670
1990	7 960	1 145	338	174	9 617
1995	9 275	934	278	115	10 602
(%)	(87.5)	(8.8)	(2.6)	(1.1)	(100.0)

Source: State Institute of Statistics 1995.

Meat production decreased significantly since 1990 in all the species including buffalo and camel. However mean cattle carcass weights increased from 128.1 in 1983 to 191 kg in 1995. In sheep mean carcass weight increased from 13.4 to 18.6 kg, the goat's from 15.7 to 16.8 kg within the same years.

Table 3. Meat production by species.

Years	Cattle	Sheep	Goat	Buffalo	Camel
1990	360 704	304 000	66 000	11 445	75
1991	339 478	303 000	64 000	8 810	105
1992	300 605	302 000	63 000	7 965	45
1993	295 995	301 000	62 000	7 125	30
1994	316 585	286 000	61 600	7 190	40
1995	292 450	273 000	61 300	5 665	40
1996	287 000	260 000	60 600	5 500	40

Source: State Institute of Statistics 1995.

Turkish economy is in a state of rapid transformation. This also holds true for the livestock sector. According to the recent projections of State Planning Organisation, in the year 2000 there will be a per capita demand of 24.6 kg red meat, 9 kg of poultry meat, 166 kg of milk and 8.5 kg of eggs. This means that red meat production has to reach almost 1 700 000 tons and milk 11 620 000 tons. This seems to be rather dreamy because of the rate of increase witnessed in the production of these commodities.

Since the establishment of Turkey, animal recording has been primarily carried out by the government institutions such as agricultural research centres, state farms and university livestock research units with the objectives of either fulfilling the formalities or requirements of academic activities. Many a times recordings, started with clearly set objectives were not properly utilised for the genetic improvement of the breeds concerned. The only exception to this may be the recordings carried out in race horse husbandry in various state farms which are still being carried out along with the private race horse farms all over the country. Race horse husbandry is being encouraged both by the MARA and Turkish Jockey Club which generate big amounts of money from the horse races.

As far as the cattle production is concerned, many attempts were made for voluntary on farm recording to be performed by the farmers themselves with the objectives of genetic improvement. The most important one was initiated in early seventies with the World Bank funded Dairy Cattle Development Project. The General Directory of Livestock Improvement\MARA monitored the project which provided very favourable credit to the producers for the purchase of the imported

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breeding stock (mainly Holstein Friesian), tractor, silage and bale making equipments, milking machines etc. etc. These farms were expected to be the local breeding stock farms. Everything went well until the repayment of the credits, then almost all the farms went out of business because they could neither market their breeding stock nor their milk at expected prices. The data collected could not be utilised because the facilities were not sufficient for fast and reliable evaluation.

Another very old and serious recording in dairy cattle (Brown Swiss) was conducted in the Eskişehir Sugar Factory of Turkish Sugar Company with the objectives of providing high producing breeding stock to the sugar beet producers. Unfortunately the recorded data between 1945-1979 were used for a Ph.D. dissertation which aimed to estimate the breeding values of the bulls which were sired in 40's, 50's and 60's (Akar, 1981).

Recently Italian government funded "Turkish - ANAFI Dairy Cattle Improvement Project" was initiated in nine provinces in Western Turkey for a period of 7 years. Almost 40% of the total cattle population of these provinces is dairy breeds (mostly Holstein Friesian). The main objective of this project was to establish a suitable information system for the dairy cattle farms based on producer collected data and also establish a breeders organisation and gradually hand over the activities totally to the producers. Another dairy cattle improvement project funded by GTZ is carrying out recording in the Aegean and Marmara regions. The main objective is to accustom the producers to organise themselves and finally become breeding stock dairy farmers. Unfortunately these projects have very short lives because the nonent the foreign funding is terminated the project stops. This is mainly due to the farmers' and the government's inability to establish the infrastructure for the continuity of these efforts. Furthermore the farmers are generally indifferent because there are no solid benefits or incentives for them to continue.

State farms have very accurate recording in their dairy units. All the cattle are identified both with tags and tattoo. They have very accurate pedigree cards which also includes date of AI, calving date as well as monthly milk recordings. The whole data is utilised for individual performances as well as herd average performances. Presently the State Farms are the most dependable breeding stock providers locally. They are the most important breeding stock disseminators. Their stock is also better than the imported pregnant heifers with respect to adaptability and the meagre feeding and management conditions provided by the farmers in general.

Table 4 gives the mean farm sizes and their distribution in the country. It is clear that almost 83% of the farms possess less than 9 cattle of all ages. Only 0.12% of the farms have more than 50 cattle of all ages

Table 4. Cattle farm sizes in Turkey.

Number of animals	Number of farms	Percentage
1-4	1 681 714	59.68
5-9	797 846	23.30
10-19	281 076	9.97
20-49	54 634	1.93
50-99	2 976	0.11
>100	211	0.01
Total	2 818 457	100.00

Source: State Institute of Statistics 1987.

It is extremely difficult to record domestic cattle in Turkey. In 1972 only 9% of the cattle population was exotic dairy breeds and their crosses. Presently of the 11 789 000 cattle present in Turkey 14.4% are pure exotic dairy cattle, 40.5% are cross-breeds and the remaining 45.1% are the local breeds (SIS, 1995). This shows that dairy farming is increasing and the demand for exotic breeds and their crosses is extremely high. Hence an efficient animal recording is urgently needed for the improvement of these dairy cattle and their crosses.

Among the local breeds only the Kilis (very similar to Shami breed) variety of the South-eastern Anatolia Red Cattle is a promising genotype and it can be utilised in breeding programs but it is defective in milking because it has to be hand milked.

Of the 34 million sheep in Turkey almost 85% are fat-tailed and the remaining 14% are semi-fat tailed or thin tailed (Table 5).

Table 5. Sheep breeds of Turkey.

Breed	Proportion	Milk prod.	Live wt	Prolificity
Fat tailed				
Akkaraman	43.2	50	45	1.05
Morkaraman	24.4	60	45	1.05
Daglýc	12.3	40	40	1.02
Awassi	2.3	150	45	1.10
Thin tailed				
Kývýrcýk	7.7	70	40	1.15
Karayaka	3.5	40	35	1.05
Cross-breeds	3.0
Others	3.7

Source: FAO Animal Production and Health Paper No. 60.

Turkey wasted a lot of time and resource for Merino crossbreeding between 1930-60 for developing Anatolian Merino. Unfortunately these efforts did not bring expected benefits because milk production decreased, mortality increased, uniformity in coat colour was very adversely affected due to the occurrence of coloured patches. Furthermore significance of fineness in wool decreased and nowadays carpet wool is in higher demand and Merino cross-bred wool is not suitable for carpet industry. Had the same intensive allocation of resources were diverted to pure breeding and selection of the local breeds, a great improvement would have been achieved because of the existing great variation in these breeds.

Recording is very limited in most of these breeds and State Farms provide breeding stock to farmers in the case of Awassi, Chios, Akkaraman and Tahirova (1/4 Kýmýrcýk 3/4 Ost-Frizland). The only progeny tested nucleus breeding is employed on Ceylanpınar Awassi population under the supervision of the University of Çukurova (Gürsoy *et al.*, 1997).

4. Awassi improvement project

Awassi breed makes up 2-3 % of the total sheep production in Turkey and is well known for its high milking ability and growth performance. It is the major breed in the whole Arabian peninsula. It has proven to have a higher milk production and growth performance than the Iraqi, Syrian and Jordanian strains (Al-Rawi *et al.*, 1994; Bahhady *et al.*, 1994).

Since 1987 Awassi population (30 000 ewes) in Ceylanpınar State Farm (size 170 000 hectares) is being carefully screened each year for exceptionally high milk producers (approximately 500 ewes) and placed in the pre-nucleus flock. This flock is individually identified and milk recorded the next year and those eligible enter the nucleus flock. Nucleus flock provides the test rams, rams for the nucleus flock from the planned mating (AI) of top producing ewes with the progeny tested rams. The surplus pedigreed rams are used in the multiplier and production flocks.

Table 6. Data collected from the Awassi improvement project.

Mating (AI)	Lambing	Growth	Milking
Weights	Lambing Date	30th day wt.	ICAR- A-4
Semen charact.	Birth wt.*	Weaning wt.	Traditional
Date of AI	Sex of lamb	Mid-fattening wt.	
Sire No.	Type of birth	Final wt.	
Ewe No.		6th month wt.	
		12th month wt.	

*Ceased since 1997 (previously determined values are used if needed).

University of Cukurova is monitoring the data collection and evaluation. The State Farm is providing the animals, essential inputs such as feed, labour, facilities and other consumables. All the data (Table 6) is loaded to two computers one in Ceylanpýnar and the other in the Cukurova University. Since 1992 three groups of tested rams have been used for planned matings with the top producing ewes of the nucleus flock in order to meet both the ram needs of the farm and also the test rams for the progeny testing scheme. In Ceylanpinar Awassi population milked yield per ewe increased from 70 kg to 152 kg within 7 years. Part of the increase may be attributed to the ongoing progeny tested selection and the outcrossing with the Israeli Awassi rams introduced to the population in 1977 and 1991 (Gürsoy *et al.*, 1997).

Table 7. Mean milked yield and the dissemination of breeding stock.

	1990	1991	1992	1993	1994	1995	1996	1997
Ewes milked (000)	23.3	17.9	15.5	12.1	14.4	13.0	12.5	13.0
Milked yield/ewe	66.9	81.3	90.1	133.6	118.3	136.0	141.5	152.3
Males dissem.	1026	524	391	384	239	2 512	177	NA
Females dissem.	5 285	1 940	3 134	3 498	7 502	2 260	2 499	NA

As mentioned earlier the small holder producers do not have the consciousness, social, cultural and economic infrastructure as well as the incentives to record by themselves or establish breeders associations or unions and perform the task together for the genetic improvement of their animals. Therefore government bodies such as the MARA, Universities, Agricultural Research Centres must participate and carry the task until they themselves are prepared to overtake the responsibility. Hence the following steps sounds proper for the small holder farms:

- Organise each province within itself.
- Establish X Breeders Association and register the innovators from each village as members.
- Let them screen their own flocks and identify the exceptional animals at the peak of the season and register only the exceptional animals.
- Establish or identify a centre for the management of the exceptional animals (pre-nucleus).
- Record the animals if possible with the labour of the producers themselves and meanwhile train them for animal recording.
- Use innovative producers' livestock for on farm progeny testing.
- Show them the superiority of the nucleus animals and let the farmers do their own comparisons.

5. Recording proposal for small holder farms

- Organise scientific and social events for bringing together the farmers participating and let them feel they are different from those who do not participate.
- The government should give incentives and/or side benefits (subsidies) for the participating farmers through the Breeders Association.
- Organise some of the farmers to be nucleus breeders and catalyse the sale of the breeding stock of those farmers.

Provision of cheap inputs, low interest credits, markets and other essentials will definitely bring success and in a short time let them start overtaking some of the responsibilities and eventually hand it over. Furthermore the government institutions MARA, universities and the Agricultural Research Centres should always be close to them as co-ordinators, moderators or catalysts.

6. What to record?

Depending on the breeding objectives of the breed in question a minimum set of data may be recorded with a moderate loss of accuracy in the precision of the breeding values. As far as milk is concerned recording may be further simplified without appreciable loss in precision (Bariellet, 1993). Table 8 suggests a minimum set of data for the genetic improvement of milk and growth merits.

Table 8. Minimum data required for the genetic selection for milk yield and growth performance.

Milk	Growth
- Sire and dam identification	Date, sex and type of birth
- Date of parturition	Weaning weight (60 days)
- Monthly morning and evening milk recording after weaning (for 90 or 120 day estimation)	Final weight (if fattened 6th month wt.) 12th month wt.(mature wt)

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