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## Sheep and goat production systems in Hungary

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**SUMMARY** - The production conditions of sheep and goat farming in Hungary have basically changed in the last 6-8 years. There were changes not only in the property structure but also within the production system. The number of small ruminant farmers has significantly increased while the animal stock of Hungary has been broken down into small flocks. This new situation has influenced the use, the breeding, the keeping and the feeding of animals. For this reason and due to the market, the costs and yields have also changed and this might lead to a change in the production systems. In this paper we analyse the main characteristics of production systems and their effects on sheep and goat farming at present in Hungary.

**Key words:** Farm size, available land, breed, market demands, reproduction systems, farming type, costs and incomes.

**RESUME** - "Systèmes de production ovine et caprine en Hongrie". Les conditions de production de l'élevage ovine et caprin en Hongrie ont changé radicalement au cours des 6-8 dernières années. Il y a eu des changements non seulement dans les structures foncières mais aussi dans les composantes des systèmes de production. Le nombre d'éleveurs de moutons et de chèvres a augmenté significativement alors que les effectifs d'animaux en Hongrie se sont réduits de façon très sensible. Pour cette raison et à cause de l'évolution du marché, les coûts et les rendements ont aussi changé et cela pourrait conduire à des transformations des systèmes de production. Dans cet article, nous analysons les principales caractéristiques des systèmes de production et leurs effets sur l'évolution de l'élevage des petits ruminants actuellement en Hongrie.

**Mots-clés :** Taille des exploitations agricoles, disponibilité des terres, demande du marché, systèmes de reproduction, type d'élevage, recettes et dépenses, Hongrie.

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### Introduction

The production system applied is influenced by several factors. The most important factor is the farm size, the size of the land used, the species, the type of the enterprise, the market demand, the price and the revenue. These factors are only slightly modified by the employment, the use of land and the social security. However, labour has a significant effect on the system.

At the end of the 1980s large-scale farming was characteristic of the sheep sector in Hungary but in 1997 the majority of farms are small-scale private farms. In the goat farming sector, small-scale farming was predominant even in the last decades, however, there were also some large scale goat farms (cooperatives and state farms). At present goat breeding farms are private farms of small or large scale.

We would like to present here the main characteristics of the present sheep and goat farming systems.

### Materials and methods

In the evaluation of the sheep and goat breeding systems we applied the data of the survey of the Sheep Produce Council and the Agricultural Chamber of Hajdú-Bihar county. These included data on 1,300 sheep breeding farms in the country and 273 in the county of the period between 1994 and 1996. The questionnaires used in the survey -containing all the accessible information on the two

kinds of animals- have been prepared by the Institute for the two organizations. In the evaluation of goat farmers data we used the information obtained from the various associations. A small part of the processed data of the questionnaires received will be presented in the description of the characteristics of the production systems.

## Results

### Farm size

The survey of the Sheep Products' Council shows that by the end of 1996, 6,799 natural and legal entity were dealing with sheep farming in Hungary. 78.8% of the ewe stock was in the property of individual farmers; 21.2% did farming in cooperatives, in the forms of Ltd. companies and other small companies (Table 1). In the case of individual farmers the average number of ewe did not reach 100 (96.6), however, the size of farms varied considerably (1-5,000). In the case of the 107 cooperatives the average number of ewe was 959, at Ltd. companies 1,025, while at small companies there were 670 ewes. The average number referring to the whole stock was only 119 animals; for being profitable 2 or 3 times more animals would be required. In more than 4,950 farms less than 100 ewe were to be found (Jávor *et al.*, 1997a). Such a small-scales sheep farming is not at all or only slightly profitable.

In general, farms of more than 300 ewe are profitable. The data available on the goat stock are not sufficient. The average farm size was of several tens of animal; in most farms there were 10-15 nanny goats and their offsprings, although there were also farms of several hundreds of animals at the beginning of 1997. However there were not more than 5 farms like that, and were not more than 20 where there were more than 100 goats. The total number of animals was estimated to be between 50,000-70,000. Obtaining a correct number is impossible as the number of goats in sheep farms is unknown at present.

Table 1. Distribution of flock sizes in Hungarian sheep farms (1996)

No. of ewes	Private farms		Companies		Altogether	
	No. of farms	No. of ewes	No. of farms	No. of ewes	No. of farms	No. of ewes
1 - 10	1,294	8,503	0	0	1,294	8,503
11 - 50	2,540	69,691	5	179	2,545	69,870
51 - 100	1,100	87,322	7	541	1,107	87,863
101 - 200	870	132,571	16	2,505	886	135,076
201 - 300	400	101,375	19	4,828	419	106,203
301 - 400	173	60,644	15	5,408	188	66,052
401 - 500	107	49,400	15	6,823	122	56,223
501 - 1000	104	72,739	48	34,695	152	107,434
1001 - 2000	21	28,805	34	49,238	55	78,043
2001 - 3000	7	16,856	12	29,245	19	46,101
3001 - 4000	2	7,478	5	17,146	7	24,624
4001 - 5000	1	4,145	3	13,079	4	17,224
5000 -	0	0	1	8,047	1	8,047
Altogether	6,619	639,529	180	171,734	6,799	811,263

### Species

Surveys show that the majority of sheep stock was of Merino (Table 2). The survey performed in the most important sheep farming county has justified this distribution (Jávor *et al.*, 1996). 95% of this was of Merino. This distribution determined the production system. Merinos are mainly used for meat and wool production, and a small part is used for milk production (in the county survey the crossbred milking stock was not included).

Table 2. The breed structure (%)

Flock size	Merinos	Meat sheep	Milk-sheep	Cigája	Racka	Others
1 - 20	87.71	5.00	0.30	3.46	1.24	7.53
21 - 50	84.20	3.33	2.53	3.29	0.60	5.50
51 - 100	82.12	6.08	0.65	12.90	3.23	2.06
101 - 200	76.42	8.13	0.81	9.76	0.81	4.07
201 - 300	87.26	4.71	0.00	4.57	2.31	1.14
301 - 500	80.66	10.52	1.38	3.97	1.07	2.41
501 - 1000	64.63	10.53	4.21	15.37	0.00	5.26
1001 - 3000	90.42	9.17	0.00	0.00	0.00	0.42
3001 -	97.50	0.00	2.50	0.00	0.00	0.00

In the last years a significant part of the sheep stock has been rented and in the categories of 1,000-3,000 the proportion of ewe as a function of the stock has reached the 25%. The data of the county survey mentioned above show that the proportion of rented sheep has decreased in 1996; its proportion was 1.5-2.5% of the whole sheep sector.

Regarding goat farming the stock distribution by species structure was not so homogeneous. Several kinds of imported species were found in the stocks (Sanen, Alpin, Toggenburg), however the majority of the stock was of various coloured types of the native Hungarian species and the crossbred types of the imported species.

## Land use and feeding

The size of the land used influenced the number of animals kept on the area. The number of animals and the area used (rented and own) are directly proportionate. 42-48% of sheep farmers had own grazing fields while the others used rented lands. 76-82% of these farmers worked also in plant production. The majority of the farms were of mixed farming that is besides sheep farming they were also working in other fields of production (Table 3) (Kukovics and Jávör, 1995a).

Table 3. Land used according to different flock size

Flock size (heads)	Private property (ha)		Rented land (ha)		Arable land (ha)		Pasture (ha)	
	x	s	x	s	x	s	x	s
1 - 20	5.2	7.5	2.9	12.7	3.9	7.7	1.1	3.9
21 - 50	6.8	9.5	2.4	6.7	5.6	13.4	5.4	28.3
51 - 100	15.6	19.1	10.1	21.9	9.9	13.9	10.5	18.0
101 - 200	16.4	24.8	24.2	101.3	19.5	77.0	13.7	26.2
201 - 300	36.7	33.6	101.9	370.6	26.3	70.5	44.5	67.6
301 - 500	31.3	51.6	254.9	831.3	33.5	63.3	65.4	77.6
501 - 1000	376.1	1,349.3	111.5	182.8	345.5	1,159.8	108.1	146.2
1001 - 3000	1,437.0	2,572.7	921.1	1,671.4	1,290.3	1,817.4	287.4	311.4
3001 -	2,150.0	3,040.6	4,000.0	2,828.4	2,000.0	2,828.4	2,250.0	1,060.7

The area available determined the feed resources. In general in small-scale farms feed was purchased (roughage and fodder), while in large-scale farmers feed was ensured by own production. 67% of sheep farmers could make use of stubble fields and only 59% were able to make use of other by products. This has significantly increased the feeding costs and -especially in late summer and mid-autumn- has significantly modified the production systems. 44-47% of the farms purchased the cereal fodder (mainly pelleted mixed fodder); the rest ensured feeding by own production. 70% of the

farms produced roughage by themselves and 50% of the farms purchased it. Only 20-25% of the farms used fermented fodder (senage, silage). The material required for fermented fodder was produced by 50% of the farms the rest purchased it.

The area used by goat farms and the types of feeding were basically similar to sheep farming discussed above. Grazing type of feeding was determinant, only a few farms were semi-intensive or intensive.

### Type of enterprise

Based on the results of the surveys sheep farming can also be categorized by the type of enterprise. 685 of sheep farmers are small-scale farmers, 11% entrepreneurs, 9.5% economic organizations (cooperatives, Ltd. companies, other small companies). 1.5% are full time and 10% are part-time sheep farmers. By categorizing this way is mainly important regarding incomes and expenses.

The significant part of goat farmers are small-scale farmers, and most of them do farming in part-time and moreover this is mainly the responsibility of the wives or children.

### Market demand

Almost all the lambs produced in the Hungarian sheep industry is exported to Italy. This market requires a perpetual supply, nevertheless there are special seasons (Easter, Christmas, Ferragusto) which cover two-third of the total sales. For example, in 1996 -calculating on a quarterly basis (in the first-second-third-fourth quarters of the year) 264 - 234 - 206 - 206 thousand live lambs (altogether 910 thousand heads) were exported to Italy. In addition to this 6 - 5.5 - 13 - 15.5 thousand slaughtered lambs were exported to Italy (Jávor *et al.*, 1997b). Our export market mainly demands lambs with a live weight between 16 and 27 kg, nevertheless the weight of lambs exported ranged from 13 to 40 kg. Taking into consideration that the majority of the farms' income is generated from selling lamb, the farms concentrate on producing lambs within the above mentioned weight range. In most cases lambs of 16-24 kg are sold, so meat production per ewe is lower than it could be expected. The suckling lambs (16-20 kg) and the weaned lambs (20-24) sold consume small amount of feed, therefore the expenses and the revenues are low. In many cases it was less worth keeping the lambs until they reach 25-30 kg, since the excess did not result in proportionally higher revenues.

The permanent demand influences the utilized lambing period as well as the applied lambing system (Tables 4 and 5). The small-size sheep farms traditionally operate with a lambing period for Easter sale, and with the increase of the stock the lambings are divided among the three lambing periods. With the increase in the sheep stock, the proportion of the sheep farms using traditional lambings have greatly decreased and the proportion of farms using frequented and divided lambing system are increasing (Kukovics and Jávor, 1995a,b).

Table 4. The utilized lambing seasons (%)

Flock size	December-February	May-June	October-December	Other
1 - 20	73.59	3.04	16.31	6.43
21 - 50	70.91	6.37	20.85	6.95
51 - 100	48.39	10.00	30.85	11.26
101 - 200	50.54	11.95	24.05	13.68
201 - 300	45.94	12.03	25.94	16.09
301 - 500	47.67	15.33	28.83	8.17
501 - 1000	33.25	22.75	25.50	18.00
1001 - 3000	50.58	9.58	34.42	5.42
3001 -	50.00	17.50	32.50	0.00

Table 5. Lambing systems used (%)

Flock size	Lambing		
	Annual	Annual but divided	Frequent
1 - 20	76.97	9.52	13.49
21 - 50	58.86	20.57	20.57
51 - 100	42.34	24.32	33.33
101 - 200	36.56	27.96	35.48
201 - 300	23.53	32.35	44.12
301 - 500	13.33	26.67	60.00
501 - 1000	10.53	26.32	63.16
1001 - 3000	8.33	33.33	58.34
3001 -	0.00	50.00	50.00

Only a low proportion of the domestic sheep stock has been milked in the past few years. The number of sheep that have been milked is about 60-70 thousand heads, most of which are Merino, however an increasing number of pure-bred milking and cross-bred stocks have also been milked. The cheese processed from milk sold for: kashkaval and cream cheeses have been exported to 26 countries. Considering the fact that compared to the demand the amount of sheep milk available for processing is small, the major objective is to increase the amount, although the nutrition value of the sheep milk was of high importance when determining the price.

The market demand for goats did not have a great influence on goat producers. Most of them have produced kids to be sold at Easter, after Easter the amount of meat for sale sharply decrease. The market demand is not permanent, though in the spring and summer months there was moderate interest for goat kids meat at a substantially lower price. Despite the demand only a small number of kids were sold at the end of the year. The goat farmers are involved in kidding once a year and milking afterwards, keeping meat goats will be the opportunity of the future. Large-scale cheese-making plants have not been established. Several small producers make home-made cheeses and cottage-cheese type products from their own milk. Cooperatives at a micro-regional and regional levels started to be established in 1997. The influence of these cooperatives on the production system will expectedly be observed from the next year on.

10,000–12,000 kids weighing from 8 to 18 kg of the disintegrated stock have been exported per year, mostly to Italy together with the sheep shipments. Due to the work of the local cooperatives and breeding associations, this number can increase.

## Expenses and revenues

Perhaps only determining the number of stock consumes more energy than accurately determining the expenses. The reason for this is that in most cases the producers did not include the counter-value of their own work in their calculations, even if they did so a very low counter-value was calculated. Regarding sheep farmers the expenses for calculations are acceptable, but similar figures from the goat farmers were not accessible for us as such registration had not existed.

The result of the above mentioned county survey revealed that the farm size (the number of ewes) fundamentally influences the expenses per ewe (Table 6), and internal division of expenses is modified by the type of the enterprise (Table 7) (Jávor *et al.*, 1996). It seemed that the increased number of sheep increase expenses, but wage and other expenses increased parallel with the growing number of sheep. Besides, the expenses could be determined more accurately. As for the various types of enterprises the biggest differences could be observed regarding the wage, feeding and the so-called other expenses. The charges of the capital employed were not included in these figures.

Table 6. Costs as a function of the stock size

Number of ewe	<20	20-50	50-100	100-300	300-500	500-1000	>1000
Cost per ewe (HUF)	2,310	3,897	4,445	4,154	4,318	6,665	6,976
Total number of ewe (pc)	59	1,454	3,654	13,034	10,756	10,915	19,580

Table 7. Percentage distribution of costs by type of enterprise

Cost	Small-scale farmer (%)	Independent farmers (%)	Economic unit companies (%)	Full time (%)	Part-time-farming (%)
Labour	8.2	13.1	30.6	22.2	7.1
Veterinary	4.4	2.7	1.9	4.6	5.5
Fodder	52.9	44.8	42.1	41.5	30.8
Energy	9.5	7.4	3.8	1.2	6.7
Shearing	3.0	2.3	1.3	0.7	3.1
Services	9.8	5.0	4.4	1.0	5.2
Premises rental fee	1.5	9.4	1.4	0.0	0.5
Other cost	10.6	15.3	14.5	28.8	41.2
Total	100	100	100	100	100

Considering other elements of the production system, the expenses and the income varied substantially (Table 8).

Table 8. Revenue and costs as a function of the various characteristics of farming

	Income/% distribution of ewe and income (HUF)				Total HUF (100%)	Total costs/ewe (HUF)
	From wool (%)	From meat (%)	From milk (%)	From manure (%)		
Sheep farming of meat and milk	6	71	23	0	6154	7498
Sheep farming of meat and wool	6	93	0	1	6285	5455
Enterprises of sheep farming only	5	94	0	1	5433	4003
Enterprises of other agricultural activities	6	89	4	0	6611	5344
Enterprises of other non-agricultural activities	6	91	3	1	5283	7747
Feeding fodder of own production	5	93	0	2	5848	4852
Feeding own and purchased fodder	6	90	4	0	6227	5955
Feeding purchased fodder only	7	88	4	1	7078	6139
Grazing stubble fields	6	90	3	0	6668	5823
Not grazing stubble fields	5	91	3	1	5038	5917
Feeding by-products	6	89	4	1	6565	6544
Not feeding by-products	6	93	0	1	5894	4104
Rented grazing fields	6	86	7	1	6541	6769
Own grazing field	5	95	0	0	7082	5005
Mixed grazing field	7	91	1	1	5592	5417
100% inspected stock by vet	6	87	7	0	4815	7656
Inspected partly by vet	7	88	4	0	5626	6830
Non inspected by vet	5	91	3	0	6610	5080

The table based on the analyses of the above mentioned county survey contained the income and the aggregated expenses. When preparing the calculations (1995) the average procurement prices were the following: wool 71 HUF/kg; lamb 376 HUF/kg; milk 56 HUF/kg; manure 163 HUF/ton. (Partly as a result of the inflation the prices have considerably risen). The average prices in 1997 are in the above order 125; 425; 105 and 210 HUF. (The expenses -in accordance with the inflation- have risen faster). In the given county only Merino type sheep were milked, therefore the milk production (income) should be assessed considering this fact. The charges of the capital employed were not included in these figures, either.

With the increased number of stock the demand for human resources has also risen. In small farms sheep farming took place on a family basis, in larger farms employees were also needed. The number of the employees have been gradually growing and consequently the expenses of production is increasing.

## Conclusion

The production systems of sheep and goat farming in Hungary have developed based on the following factors:

(i) Number of ewes and female goats: The majority of the ewes were in small flocks on private farms. The profitability, in general, could be reach with at least 300 ewes in production. The average size of nanny goats was much smaller (10-15 heads), most of the goat breeders/keepers were only part-time farmers.

(ii) The breed used: However, it was known that the production level of Merinos was lower than expected these breed group was dominating in the national flock. Farms having 100-200 or 500-1,000 heads had better breed distribution than the others. In goats, the native Hungarian breeds were dominating, but several other breeds available on those farms where the production level was higher.

(iii) The size of land for utilization and the available feed: Most of the farms were mixed producers (cropping and breeding). The smaller part of farmers had their own grazing land, the others used rented pastures. As the land size was growing the rates of feed self production was increasing.

(iv) Market demand: The dominating product was the live lambs exported to Italian market. This market was demanding mainly light weight lambs and kids, mostly concentrating on there periods, however, the exportation could be continuous during the year. Along with the increasing flock size the rates of frequent and divided lambing systems were increased and the percentage of annual lambing system was reduced.

(v) Income and expenses: The production costs per ewe per year were increasing along with the flock size. Part of them were understandable (e.g., the small farms did not pay any tax), but the others not. The fodder cost was the dominating one, but the so called other cost had an increasing ratio. The meat was the dominating resource of income, but the profitability was modified by the other traits of production systems.

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