Breeding objectives of Hungarian dairy sheep breeds

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SUMMARY – In the Hungarian sheep industry there are about 60,000 head of sheep milked in a total of one million ewes in 1999. A large part of the milked ewes are Merinos, while the others are partly purebred and partly crossbred milk type sheep as follows: Awassi, Lacaune, British Milksheep, Cigája, Trans-Sylvanian Raczka, (Merino x Pleven Blackhead) F_1 /Pleven F_1/, Pleven F_1 x Black East Friesian, (Merino x British Milksheep) F_1, (Merino x Lacaune) F_1, (Merino x Awassi) F_1. During the last years breeding and production data on these genotypes were collected continuously, and added to the information about the production systems (size of land, labour, feeds and forages, prices of lambs, milk, wool and cheese, as well as the prices of different feeds. Data used in the evaluation were collected in seven farms between 1997-1999. Since the three production systems (extensive, semi-intensive and intensive) are practised in the country, the evaluations were carried out according to the breed/genotype and the production system. Along with the average reproduction and production results, economic data were calculated referring to one single ewe, one labour unit, one Ha, and one unit of feed. Different calculations were made to find out the possible correlations between the studied traits.

Key words: Milk sheep genotypes, production traits, economic values, correlations.

RESUME – *"Objectifs d'amélioration chez les races ovines laitières en Hongrie". Le secteur de l'élevage de moutons comptait 9 millions de brebis en 1999, parmi elles 60 mille brebis traitées. La plus grande partie des brebis traitées appartient au mérinos, une partie du reste est de race pure et d'autres sont croisées en constituant des races de moutons de lait : Awassi, Lacaune, British milksheep, Cigája, Racka Gyimes (Mérinos x Pleven) F_1/Pleven F_1/, Pleven F_1 x Frison noir, (Mérinos x British milksheep) F_1, (Mérinos x Lacaune) F_1, (Mérinos x Awassi) F_1. Les éléments de production et d'élevage de ces génotypes (qui se composent des informations suivante sur les systèmes de production: capacité de travail; surface; quantité de fourrage et de fourrage concentré; prix du lait, des agneaux, du fromage, de la laine et de plusieurs fourrages) ont été réunis dans les années passées. Pour l'évaluation on a réuni les éléments de 7 fermes (de 1997 à 1999). Puisque les trois systèmes (extensif, semi-extensif, intensif) de production sont pratiqués en Hongrie, on a fait l'estimation selon la race/génotype et le système de production. On a calculé les chiffres économiques en projetant sur une brebis, sur un travailleur, sur un hectare et sur une unité fourragère (à côté des résultats moyens d'accroissement et de production). On a fait des calculs pour trouver les relations éventuelles parmi les caractères examinés.*

Mots-clés : *Génotype des moutons de lait, éléments de la production, valeur économique, correlations.*

Introduction

Sheep milk production in Hungary is not as common as it was three decades ago, when more than 60% of the ewes were milked. During the last 10 years the whole agriculture was reorganized, and the ownership of the lands and that of the animals completely changed. The political changes resulted in a huge reduction in the number of farm animals at the beginning of the 90s. In 1999 there were about one million ewes belonging to 21 breeds kept on less than 8500 farms. Nowadays, not more than 60 thousand ewes are milked, and most of these ewes are Merinos.

Concerning profitability, the sheep industry is not a very good activity in agriculture on an average level. The economy of the sector strongly depends on the number of lambs sold; wool gives only 2-5% of the total income. There are only two possibilities to improve profitability: to increase prolificacy (the number of lambs for market), or exploit the milk production ability of the ewes. Of course, some breeds give the chance to improve both at the same time.

In the present study we intend to evaluate the production level and the economic situation of the Hungarian dairy sheep farms.

Material and methods

There are about 150 sheep farms in Hungary, where the majority of the ewes are milked, but only ten percent of them are under performance control (milk recording) of the Hungarian Sheep Breeders' Association. Data were collected from 14 different farms, but the results of only seven farms could be utilized in the final analyses, because of inaccurate information. Breeding and production data of four years (1996-1999) were collected from the milk recording system of the Association and from the farms.

As much as 12 different genotypes are bred on those farms:

(i) Farm 1. Cigája (one of the best farms in Hungary).
(ii) Farm 2. Cigája.
(iii) Farm 3. British Milksheep (Merino x British Milksheep) F_1.
(iv) Farm 4. Merino (Merino x Pleven Blackhead) F_1 /Pleven F_1/, Pleven F_1 x Black East Friesian.
(v) Farm 5. Awassi F_1, Awassi F_1 x British Milksheep.
(vi) Farm 6. Lacaune, Lacaune crossbreds (mainly Lacaune x East Friesian).
(vii) Farm 7. Awassi (Merino x Awassi) F_1 /Awassi F_1/, Trans-Sylvanian Raczka.

Their flock sizes changed from year to year. Total number of ewes varied between 5,936 and 8,957 heads. Farms 3 and 6 belonged to two research institutions, where breeding, reproduction, biotechnical and nutrition experiments were carried out continuously. The first two and the 5th ones were private farms, the 4th one a new type of co-operative, and the last one a corporation.

Milk recording was performed for selection and technical advisory purposes. Milk yield was recorded individually for each year following the A4 method, while the composition was studied with two methods: 50-100 heads from each genotype/flock were sampled individually along with the recording work in every 4th week (which were operated in most of the flocks), and milk collection tanks were sampled in other cases. For a kind of flock control, milk tank samples were taken on every recording day concerning all of the flocks.

The whole lactation yield was not calculated, only the quantity of marketed milk was estimated by Fleischmann method (adapted and improved by Kukovics *et al*., 1988). For this reason the production of the milking days were in the base of analyses.

Reproductive results (lambing date, litter size, mortality of lambs, etc.) were recorded by the above-mentioned Association, other data were collected directly from the farms. The costs of various feeds could not be calculated separately, because of the differences in the farms' own cost recordings. Only the natural data of the supplementary feeds were given in the analyses. The farm managers, under our control calculated variable expenditures.

Sheep activity income was calculated taking into account the sales of milk, lambs, wool and manure, as well as breeding stock. The culled ewes and rams gave only the 3-4% of the total income, so in this evaluation they were not presented separately. The margins were calculated by deducting the variable expenses from the sheep activity income. All of the parameters (income, cost, and margin) were calculated in Euros.

There were milk, lamb, wool, manure and breeding stock sold from the farms, however three of them had separate dairy unit as well, but more milk were processed in them than their own milk production. The milk and the wool sold as raw material, the average selling weight of lambs were varied between 16-27 kg live weight.

The reproductive system was based on one mating season per year, but the lambs were sold during a longer period (from Eastern to the beginning of summer) in each flock. The ewes and ewe lambs mated in early-mid autumn. The milkings were started after the lambs weaned or sold. The milked ewes normally dried off in August, but in some cases (e.g. Awassi, Trans-Sylvanian Raczka) in

September or October. Hand milking was utilized on the first two farms, and mechanical on the other ones.

Having all data from the farms we had to realize two things: one or two years were not enough for the proper evaluation and neither the studied years nor the genotypes could be pooled together. So, the different genotypes/flocks were separately shown in the tables. Because of the farm and income/cost differences not all the studied genotypes and flocks could be used in the calculation of phenotypic correlation among the reproduction and milk yield data as well as the income, cost and profit concerning the years in question. Only the data of following flocks were included in these calculations: Cigája (Farm 2); British Milksheep F_1 (Farm 3); and all genotypes of Farm 4 and 5.

Results

The most important objectives of the studied flocks/genotypes were summarized in Tables 1-4. One could easily discover the differences among the farms, flocks and genotypes, as well as years.

According to the data analysed the milk production and the reproduction determined the values of sheep activity.

In the average daily milk yield, and the quantity of milk sold per ewe we observed 200-250-300% differences among the different genotypes. There were big differences also found among the years, which could reach the 20-25%. Merinos gave the lowest results in all cases.

The number of milking days was above the 100 days, except some cases. The ratio of milked ewes changed between wide range.

In reproduction there were 100-155% differences among the studied populations. The number of lambs sold was affected by breeding work: the level of replacement intensively changed from farm to farm, and from year to year. The increase of flock size reduced the income originated from selling lambs. Selling breeding stock also had a strong affect on profitability.

There were big differences observed among the flocks in the offered concentrate feed, hay and silage, per ewe and per litre of milk, however, the nutrition of all farms was based on pasture.

Differences among variable expenses were more than 50% between the flocks. Similar results were observed in the case of milk income per ewe, and lambs selling income per ewe as well as ewe and ewe-lambs. In the milk and lamb prices we could observed 20-30% differences. The role of wool production was negligible.

The margins calculated for one ha, or one manpower unit (MPU) or one ewe plus ewe lamb showed large variability among the flocks and years. For this reason the profit per ewe also had big differences among the studied flocks and years.

Relationships between economic results and technical indexes

As the multiple regression did not show a clean picture concerning the effects we calculated the correlations between milk production, prolificacy as well as gross income, expenses and profit. And after it the relations between the income and profit and the cost and profit were calculated. The results are summarized in Tables 5-6.

Prolificacy was strongly correlated with profit, but had great effect on the cost; and only in one case on income as well. Milk production was also correlated with profit, but the effect was not so clean. In both cases year effects could be observed.

According to the results the gross income had weaker effect on the profit than that of the cost (Table 7).

Table 1. Breeding and production data of studied flocks in 1996

Farms	1	2	3	4			5	6		7	
Genotypes[†]	6	6	4	8	7	9	2	11	10	2	1
Total ewe number	320	251	140	1,680	660	1,046	380	112	65	1,118	164
Ewe lamb number	140	104	50				20	134	111	803	115
Replacement rate (%)	41.7	41.4	35.7				5.2	109.8	170.8	71.8	70.1
Yearling number	210	104	30					34	30		
Forage surface (ha)	321	50	30	1,044	410	650	151	69.2	36.8		
Manpower unit (MPU)	2	2	2	5	2	3	2	3	2		
Ewe number/MPU	160	125.5	70	33.6	205	349	190	40.67	32.5		
Mean lambing date	Feb-March	Dec-Feb	Feb-March	Feb-March	Feb-March	Feb-March	Feb-March	April	April	Feb-April	Feb-April
Fertility of ewes (%)	98	100	82.9	82.7		92.2	87	92.3	94.81	72	71
Ewe lamb fertility (%)	91	98	77					100	100	68	65
Lambing rate ewes (%)	191	151	195	130.7	131	155.6		156	141	100	110
Lambing rate yearlings (%)	160	124	148					141	133	100	100
Lamb mortality	5	5	13.5	7.34	8.14	10.06		21	21	8	8
Milked ewes/ewe no. (%)	81.2	100	65	67.8	68	74.9	46.05	95.08	95.38		
Number of milking days	160	190	105	160	140	165	125	87	80		
Daily yield (liter/ewe)	0.8	0.58	0.8	0.41	0.38	0.78	0.56	0.75	0.685		
Milk production/ewe	148	111	84.5	66.1	52.7	128.07	69.6	65.25	54.8		
Fat content (%)	7	5	5.3	7.78	8.34	6.43		6.41	6.4		
Protein content (%)			5.65					5.21	5.8		
Concentrate feed/milked ewe/year (kg)		90	177	108.5	96.7	126.8	30	200	200		
Concentrate feed /milked liter (kg)		0.81	2.09	1.64	1.83	0.99	0.43	3.06	3.64		
Hay/milk liter (kg)		5.76	7.36	4.93	6.29	2.93	4.6	5.363	6.386		
Silage/milk liter (kg)		11.53				0.35					
Variable expenses/ewe/year		64.34	119.8	30.68	30.86	40.66	34	37.62	37.62		
Milk sold (liter)	38,000	28,000	6,418	58,368	19,232	89,600	12,000	7,569	3,398		
Price of milk/liter	0.26	0.2	0.3	0.26	0.26	0.26	0.32	0.26	0.26		
Price of milk/ewe	30.9	22.3	13.75	9.43	7.74	22.41	10.1	16.13	13.59		
Price of milk/ewe + ewe lamb	18.64	15.77	11.33	9.43	7.74	22.41	10.1	12.77	9.3		

Table 1 (cont.). Breeding and production data of studied flocks in 1996

Farms	1	2	3	4			5	6	
Genotypes[†]	6	6	4	8	7	9	2	11	10
Sold lambs (number)	750	276	43	1,644	673	1,193	190	96	
Price of lamb/kg	1.92	1.92	2.1	1.82	1.79	1.86	1.2	2.04	
Price of lamb/number	38.4	31.7	50.4	24.92	23.88	25.85	27.6	40.88	
Price of lamb/ewe + ewe lamb	52.4	24.6	12.74	24.39	24.35	29.48	13.8	25.16	
Gross income	70.87	56.47	65.99	35.77	33.73	49.93	38.42	58.45	14.75
Gross income/ewe + ewe lamb	73.94	41.57	25.62	35.02	34.2	53.58	24.62	38.9	10.07
Gross income/ha	122.06	295.17	145.19	39.25	55.05	86.22	61.97	87.95	26.01
Gross income/MPU	19,591	7,379	2,178	8,195	5,285	18,680	4,679	2,022	478.5
Wool kg/ewe	4.9	3.8	4.2	3.15	4.68	3.73	3	3.14	2.46
Price of wool/kg	0.32	0.4	0.4	0.45	0.45	0.45	0.24	0.46	0.47
Wool income/ewe	1.57	1.52	1.68	1.42	2.11	1.67	0.72	1.44	1.16
Manure income/ewe		0.95	0.16						
Income/ewe		–22.77	–46.39	4.34	3.34	12.92	–9.38	1.28	–27.5
Income/sold animal for breeding			32.75						13.89
Total income			58.37						23.97

[†]1 = Awassi; 2 = (Merino x Awassi)F_1/Awassi F_1/; 3 = Awassi F_1 x British Milksheep; 4 = British Milksheep; 5 = (Merino x British Milksheep)F_1; 6 = Cigája; 7 = Merino; 8 = (Merino x Pleven Blackhead)F_1/Pleven F_1/; 9 = Pleven F_1 x Black East Friesian; 10 = Lacaune; 11 = Lacaune crossbreds; 12 = Trans-Sylvanian Raczka.

Table 2. Breeding and production data of studied flocks in 1997

Farms	1	2	3	4			5	6		7	
Genotypes[†]	6	6	4	8	7	9	3	11	10	2	1
Total ewe number	450	350	158	1,680	584	1,330	400	109	68	930	140
Ewe lamb number	120	124	36				37	127	119	803	90
Replacement rate (%)	26.66	35.43	22.78				9.25	116.5	175	71.8	64.3
Yearling number	130	110	42				54	18	19		50
Forage surface (ha)	321	50	30	884	372	848	151	61.8	44.2		
Manpower unit (MPU)	3	2	2	4	2	4	2	3	2		
Ewe number/MPU	150	175	79	346	186	332	200	36.3	34		
Mean lambing date	Feb-March	Dec-Feb	Feb-March	Feb-March	Feb-March	Feb-March	Feb-March	April	April		
Fertility of ewes (%)	92	100	78.5	73.8	81.24	95.4	98	44.29	48.78	72	72
Ewe lamb fertility (%)	94	90	76.7				80	100	100	68	64
Lambing rate ewes (%)	180	134	230	124.2	120.1	149.2	100	126	130	100	100
Lambing rate yearlings (%)	145	110	135				96	117	137	100	103
Lamb mortality	6	6	24	8.52	5.4	13.2	4	14.1	8	8	7.2
Milked ewes/ewe no. (%)	91.1	100	77.8	58.87	69.3	74.3	48.2	46.79	54.41		
Number of milking days	180	190	110	163	150	163	146	76	79		
Daily yield (liter/ewe)	0.89	0.49	0.64	0.335	0.25	0.6	0.64	0.87	0.981		

Table 2 (cont.). Breeding and production data of studied flocks in 1997

Farms	1	2	3	4			5	6		7	
Genotypes[†]	6	6	4	8	7	9	2	11	10	2	1
Milk production/ewe	160	94	70.8	54.67	37.4	98.4	93.3	66.12	77.47	74.2	208.3
Fat content (%)	7.4	5.4	7.7	7.07	7.61	6.49		6.47	6.52	7.42	5.99
Protein content (%)			6.1	6.60	7.51	6.31		5.35	5.7	5.98	5.35
Concentrate feed/milked ewe/year (kg)		90	164	133	143.7	150.4	40	200	200		
Concentrate feed/milked liter (kg)		0.96	2.31	2.43	3.84	1.52	0.428	3.02	2.58		
Hay/milk liter (kg)		6.808	7.61	5.45	8.02	3.58	3.75	5.293	4.517		
Silage/milk liter (kg)		13.62									
Variable expenses/ewe/year		70.56	103.6	32.03	34.83	42.07	38	42.8	42.8		
Milk sold (liter)	65,000	33,000	7,805	35,369	12,797	85,060	18,000	3,372	2,867		
Price of milk/liter	0.44	0.29	0.38	0.41	0.41	0.406	0.32	0.44	0.44		
Price of milk/ewe	63.55	27.15	18.77	10.45	9.04	26	14.4	13.61	18.55		
Price of milk/ewe + ewe lamb	49.31	20.66	14.82	10.45	9.04	26	12.69	11.68	14.5		
Sold lambs (number)	840	346	207	1,157	559	1,375	180	53			
Price of lamb/kg	2.24	2.08	2.4	1.59	1.91	1.89	1.6	1.91			
Price of lamb/number	38.08	35.36	60	26.51	29.68	27.96	30.4	38.16			
Price of lamb/ewe + ewe lamb	55.15	26.6	62.1	22.12	28.41	28.91	12.05	15.92			
Gross income	103.39	64.52	80.93	38.65	40.81	55.73	45.7	53.34	19.75		
Gross income/ewe + ewe lamb	127.87	48.79	78.67	34.27	39.54	56.68	25.53	28.99	15.43		
Gross income/ha	191.21	448.91	629.4	53.72	62.08	88.90	76.77	59.5	30.39		
Gross income/MPU	20,459	11,223	7,867	11,873	11,574	18,847	5,796	1,225	671		
Wool kg/ewe	4.4	3.9	4.5	3.25	4.03	3.4	3	3.14	2.46		
Price of wool/kg	0.4	0.48	0.44	0.52	0.52	0.52	0.3	0.5	0.5		
Wool income/ewe	1.76	1.87	1.98	1.69	2.09	1.77	0.9	1.57	1.2		
Manure income/ewe		0.14	0.18								
Income/ewe		–21.77	–25	2.24	4.71	14.61	–12.47	13.81	–27.3		
Income/sold animal for breeding			36.16						14.71		
Total income			114.8						30.15		

[†]1 = Awassi; 2 = (Merino x Awassi)F_1/Awassi F_1/; 3 = Awassi F_1 x British Milksheep; 4 = British Milksheep; 5 = (Merino x British Milksheep)F_1; 6 = Cigája; 7 = Merino; 8 = (Merino x Pleven Blackhead)F_1/Pleven F_1/; 9 = Pleven F_1 x Black East Friesian; 10 = Lacaune; 11 = Lacaune crossbreds; 12 = Trans-Sylvanian Raczka.

Table 3. Breeding and production data of studied flocks in 1998

Farms	1	2	3	4			5	6		7		
Genotypes[†]	6	6	4	8	7	9	2	11	10	12	2	1
Total ewe number	480	437	112	1,283	629	1,430	390	150	112	2,760	1,091	83
Ewe lamb number	160	100	20				30	89	106		220	30
Replacement rate (%)	33.3	22.88	17.8				7.69	64.49	94.64		20.1	36.1
Yearling number	105	92	30				24	89	70			45
Forage surface (ha)	321	50	30	808	396	900	151	59	47.5	280		
Manpower unit (MPU)	4	2	2	4	2	4	3	3	2	19		
Ewe number/MPU	120	213	56	321	198	357	195	45	56			
Mean lambing date	Feb-March	Dec-Feb	Feb-March	Feb-March	Feb-March	Feb-March	Feb-March	Feb-Aug	Feb-March		Feb-Apr	Feb-Apr
Fertility of ewes (%)	95	100	91	85.8	87.12	94.2	90	82	91.24		70	70
Ewe lamb fertility (%)	92	94	100				84	100	100		68	66
Lambing rate ewes (%)	188	146	206	136.2	133.2	141.2	100	144	134		100	104
Lambing rate yearlings (%)	144	132	179				95	137	127		100	106
Lamb mortality	5	5	15	7.6	3.65	11.04	5	16.4	33		5	7.8
Milked ewes/ewe no. (%)	93.75	100	93.75	72.88	78.7	81.82	59.5	100	92.86			95.18
Number of milking days	170	190	103	156	157	167	161	102	110			173
Daily yield (liter/ewe)	0.92	0.45	0.863	0.438	0.37	0.714	0.763	0.897	0.884			1.30
Milk production/ewe	158	86	88.9	68.38	58.25	119.18	122.8	91.45	97.2		97.0	225.3
Fat content (%)	7	5.7	6.5	7.09	8.11	6.64		6.34	6.41		7.10	6.51
Protein content (%)			6.4					5.3	6		5.42	5.23
Concentrate feed/milked ewe/year (kg)		90	216	148	177.6	154.9	60	200	200			160
Concentrate feed/milked liter (kg)		1.05	2.429	2.16	3.04	1.29	0.49	2.18	2.05			
Hay/milk liter (kg)		7.44	4.758	3.4	3.763	1.76	3.664	3.827	3.6			1.69
Silage/milk liter (kg)		14.88	2.643	1.476	1.729	1.6	1.75	1.421	1.337			3.28
Variable expenses/ewe/year		87.51	140.6	50.17	43.79	52.54	38	47.56	47.56		65.92	73.15
Milk sold (liter)	71,000	38,000	7,841	62,674	23,474	150,361	28,500	13,718	10,109			
Price of milk/liter	0.51	0.44	0.44	0.45	0.45	0.443	0.52	0.5	0.5		0.48	
Price of milk/ewe	75.14	38.26	30.85	21.93	16.97	42.71	38	45.7	45.12		74.29	
Price of milk/ewe + ewe lamb	61.65	31.6	24.29	21.93	16.97	42.71	35.8	28.69	27.77		48.17	

Table 3 (cont.). Breeding and production data of studied flocks in 1998

Farms	1	2	3	4			5	6		7		
Genotypes[†]	6	6	4	8	7	9	2	11	10	12	2	1
Sold lambs (number)	920	540	131		710	1,561	290	109				
Price of lamb/kg	2.4	3	2.4	2.13	2.07	2.02	2.08	1.75				
Price of lamb/number	38.4	52.5	64.8	28.23	32.28	39.36	44.72	39.04				
Price of lamb/ewe + ewe lamb	60.39	53.59	59.78	30.48	36.43	31.68	24.84	15.98				
Gross income	115.8	564.9	98.02	52	51.77	83.44	84.26	86.85	45.63		74.29	
Gross income/ewe + ewe lamb	123.9	86.59	85.51	54.25	55.99	65.69	62.09	32.9	28.75			
Gross income/ha	225.8	916.1	404.8	86.14	88.93	104.37	170.2	185.4	110.8			
Gross income/MPU	18,119	22,903	6,073	17,402	17,608	23,483	8,569	3,665	2,116			
Wool kg/ewe	4.7	3.8	4.5	3.54	4.95	3.6	3.5	3.2	2.46			
Price of wool/kg	0.48	0.4	0.36	0.52	0.12	0.38	0.44	0.66	0.21			
Wool income/ewe	2.26	1.52	1.63	1.84	2.57	1.37	1.54	2.11	0.51			
Manure income/ewe		0.13	0.74									
Income/ewe		–0.92	–55.15	4.08	12.2	13.15	24.09	14.66	–18.8			
Income/sold animal for breeding			7.04						7.14			
Total income			92.55						35.89			

[†]1 = Awassi; 2 = (Merino x Awassi)F_1/Awassi F_1/; 3 = Awassi F_1 x British Milksheep; 4 = British Milksheep; 5 = (Merino x British Milksheep)F_1; 6 = Cigája; 7 = Merino; 8 = (Merino x Pleven Blackhead)F_1/Pleven F_1/; 9 = Pleven F_1 x Black East Friesian; 10 = Lacaune; 11 = Lacaune crossbreds; 12 = Trans-Sylvanian Raczka.

Table 4. Breeding and production data of studied flocks in 1999

Farms	1	2	3		4			5		6		7		
Genotypes[†]	6	6	4	5	8	7	9	2	3	11	10	12	2	1
Total ewe number	700	507	90	96	711	666	1,785	394	20	136	120	2,287	900	69
Ewe lamb number	210	110	6					12	35	64	67	495	222	18
Replacement rate (%)	30	21.7	6.67					3.05	175	47.06	55.83	21.64	24.66	26.08
Yearling number	125	93	14					26	20	22	33		58	15
Forage surface (ha)	321	50	30	30	473	443	1,188	144	7.3	56.3	49.7	333		
Manpower unit (MPU)	5	2	1	1	2	2	5	3	1	3	2	26		
Ewe number/MPU	140	253	90	96	355.5	221	357	197	20	45.3	60			
Mean lambing date	Feb-March	Dec-Feb	Feb-March	Feb-March	Feb-March	Feb-March	Feb-March	Feb-March	Feb-March	Feb-Apr	Feb-Apr	April	Feb-Apr	Feb-Apr
Fertility of ewes (%)	97	100	87.2		82.2	95.2	94.75	95	90	82.5	84.14	55	70	73
Ewe lamb fertility (%)	94	89	75.2	93.4				84	105	100	100		68	65
Lambing rate ewes (%)	185	151	255		125.2	127.5	147.25	100		155	144	110	100	106
Lambing rate yearlings (%)	147	136	197	170				97		145	145		100	108
Lamb mortality	8	7	23	18	9.11	7.6	10.32	4		13.7	12	11	8	8.2
Milked ewes/ewe no. (%)	82.56	100	85.56	81.25	64.56	66.07	74.73	54.57		76.47	73.33			46.38
Number of milking days	188	190	102	103	151	130	170	154	146	94	99			180
Daily yield (liter/ewe)	0.86	0.42	1.025	0.718	0.417	0.358	0.69	0.77	0.913	1.146	1.211			
Milk production/ewe	162	80	104.5	74.0	62.95	46.56	117.25	118.6	133.3	107.7	119.9			170.9
Fat content (%)	7.00	5.60	6.1	6.74	7.25	7.51	6.59	6.8	7.01	6.31	6.43			7.0
Protein content (%)			5.8	5.97				5.3	5.5	5.2	5.8			4.9
Concentrate feed/milked ewe/year (kg)		90	189	170	129.5	166	149	105	105	200	200			170
Concentrate feed/milked liter (kg)		1.13	2.33	2.97	2.05	3.55	1.27	0.885	0.787	1.85	1.66			0.99
Hay/milk liter (kg)		8	2.09	2.94	4.04	5.143	2.52	3.794	3.375	3.25	2.92			2.34
Silage/milk liter (kg)		16	2.3	3.24				1.812	1.612	1.206	1.083			4.56
Variable expenses/ewe/year		104.5	97.1	91	56.02	48.7	53.38	42	42	52.48	52.48			83.36
Milk sold (liter)	92,000	41,000	8,044	5,772	23,064	17,380	126,223	25,500	2,400	11,205	13,120			54.69
Price of milk/liter	0.55	0.5	0.5	0.5	0.484	0.484	0.484	0.336	0.536	0.54	0.54			0.53
Price of milk/ewe	72.02	40.43	44.58	31.31	15.71	12.7	34.21	34.69	64.32	44.49	47.47			41.84
Price of milk/ewe + ewe lamb	58.49	34.16	38.67	31.31	15.71	12.7	34.21	32.54	64.32	38.29	37.23			41.84

Table 4 (cont.). Breeding and production data of studied flocks in 1999

Farms	1	2	3		4			5		6		7		
Genotypes[†]	6	6	4	5	8	7	9	2	3	11	10	12	2	1
Sold lambs (number)	1,100	507	143		685	644	1,871	215	12	92				
Price of lamb/kg	2.2	2.56	2.2	2.2	2.06	2.044	2.176	2.24	2.16	1.81				
Price of lamb/number	37.4	43.52	66	66	33.51	37.04	31.24	28.62	50.76	36.56				
Price of lamb/ewe + ewe lamb	49.86	47.87	90.75	82.5	32.29	35.82	32.75	14.55	30.45	21.29				
Gross income	110.3	84.71	111.6	98.46	50.38	51.05	66.48	64.16	96.34	81.71	47.95	0.26		41.84
Gross income/ewe + ewe lamb	111.7	82.78	130.4	113.5	49.15	49.83	68	47.99	96.04	60.17	37.64			
Gross income/ha	287.8	993.4	452.1	363.2	73.89	74.91	102.2	139.5	263.1	156.9	174.5			
Gross income/MPU	18,437	24,835	13,561	10,890	17,476	16,593	24,277	6,719	1,921	3,169	2,879			
Wool kg/ewe	4.5	4	4.7	5	4.14	4.67	3.69	3.54	4.2	3.31	2.4	2.6		
Price of wool/kg	0.2	0.16	0.19	0.19	0.28	0.28	0.28	0.24	0.3	0.2	0.2	0.1		
Wool income/ewe	0.9	0.56	0.9	0.95	1.16	1.31	1.33	0.85	1.26	0.66	0.48	0.26		
Manure income/ewe		0.2	0.2	0.2										
Income/ewe		–8.17	33.29	22.54	–6.87	1.13	9.62	5.99	54.04	7.69	–14.8			
Income/sold animal for breeding			37.05							66.67				
Total income			167.4							103.9				

[†]1 = Awassi; 2 = (Merino x Awassi)F_1/Awassi F_1/; 3 = Awassi F_1 x British Milksheep; 4 = British Milksheep; 5 = (Merino x British Milksheep)F_1; 6 = Cigája; 7 = Merino; 8 = (Merino x Pleven Blackhead)F_1/Pleven F_1/; 9 = Pleven F_1 x Black East Friesian; 10 = Lacaune; 11 = Lacaune crossbreds; 12 = Trans-Sylvanian Raczka.

Table 5. Phenotypic correlation between prolificacy and economy traits

	Gross income	Costs	Profit
Years altogether	0.41	0.40	0.06
1996	0.36	–0.26	0.53+
1997	0.74**	–0.11	0.74**
1998	0.32	0.64*	–0.86***
1999	0.34	0.66*	–0.33

+P<10.00; *P<5.00; **P<1.00; ***P<0.10.

Table 6. Phenotypic correlation between milk production and economy traits

	Gross income	Costs	Profit
Years altogether	0.33	0.07	0.33
1996	0.83***	0.67*	–0.04
1997	0.31	0.54+	–0.32
1998	0.24	–0.13	0.58*
1999	0.21	–0.37	0.58*

+P<10.00; *P<5.00; **P<1.00; ***P<0.10.

Table 7. Phenotypic correlation between gross income and profit, as well as between costs and profit

	Gross income/profit	Costs/profit
Years altogether	0.50+	–0.30
1996	0.36	–0.71**
1997	0.33	–0.67*
1998	–0.46	–0.81**
1999	0.51+	–0.43

+P<10.00; *P<5.00; **P<1.00; ***P<0.10.

Discussion

Looking at the results we had to establish that there would not be much future for the multipurpose Merino sheep. It appeared that the studied variety of Cigája breed could improve milk yield and reproduction traits. The British Milksheep should be exploited in improving the prolificacy and could play a big role in indirect crossing for increasing prolificacy. Lacaune breed could have its own role in the Hungarian milk sheep sector. The prolificacy of the Awassi and Awassi crossbreds should be improved. The Black East Friesian also had a strong effect on milk production, but its effect on prolificacy was smaller than expected.

Having all the results it seemed that profitability was depending on the ratio of selling, but it was strongly modified by the actual average price, in which there were 20-30% differences in the studied years.

Conclusions

In the present study 14 flocks belonging to 12 genotypes were studied. The farms varied in size, level of production and feeding technology. Apart from the differences, the level of milk production and the prolificacy were equally important in improving profitability.

In Hungary, the number of farms choosing specialization were slowly increasing. After the reconstructing of agriculture the farming methods and the feeding systems should be improved and along with the breed most of the things need to be changed.

The best size for the ideal farm is yet to be determined. The monetary abilities determine farm size at present, there is no other effect. It could hardly be imagined that a flock with 100 ewes would rationally be able to function, but a flock with more than 1000 milking sheep might cause some limitations for the breeders.

References

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