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Definition of the breeding objective of the Greek dairy prolific ewes

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SUMMARY – In Greece, the breeding objective is defined as the improvement of milk production with lamb as a by-product. Milk is usually processed to cheese. The lambs are slaughtered after a suckling period of 42 days at an average live weight of 14 kg. The total revenues of the farm and the relative importance of milk and meat vary among the different production systems and breeds. Data from the Agricultural Research Station of Chalkidiki were analysed, where the income is derived from the sales of milk and slaughtered lambs, from male and female lambs and rams with high genetic merit to other farmers for reproduction purposes. Moreover, data available from private farms were taken into account. Milk recording is carried out in 45 farms counting 5400 head. However, there is no recording on milk composition, somatic cells, economic indexes, health and functional traits. The results of the present study show that the milk sold contributes about 40% of the total income, while lambs sales for meat are lower than 10% and sales from reproduction animals are about 50%. Regarding private farms, the contribution of milk and meat sales to the total income is 70% and 30%, respectively, depending on the production level of the farm.

Key words: Breeding objective, genetic evaluation, prolific sheep, Chios breed.

RESUME – "Définition des objectifs de sélection des prolifiques brebis laitières grecques". L'objectif de sélection en Grèce est l'amélioration de la production de lait et l'agneau au sevrage comme un produit secondaire. Le lait est utilisé pour la production du fromage. Les agneaux sont abattus après 42 jours d'allaitement, au poids vif d'environ 14 kg. Les revenus totaux et l'importance relative du lait et du mouton varient selon les systèmes de production et les différentes races. Les données de la Station de la Recherche Agronomique de Chalkidiki sont analysées. Les revenus sont dérivés à partir des ventes du lait, de mouton et des animaux reproducteurs. En plus, les données disponibles de fermes privées sont considérées. Cinq mille quatre cent animaux dans 45 fermes sont contrôlés. La composition du lait, les cellules somatiques, les indices économiques et les caractères fonctionnels ne sont pas contrôlés. Les résultats de cette étude ont indiqué que le lait contribue aux revenus totaux à 40%, le mouton à un pourcentage de près de 10% et les animaux reproducteurs à 50%. En ce qui concerne les fermes privées le lait et le mouton contribuent aux revenus totaux à 70% et 30%, respectivement.

Mots-clés : Objectif de sélection, évaluation génétique, ovins prolifiques, race Chios.

Introduction

Breeding goal definition is the first step in designing genetic improvement strategies. The breeding goal specifies the traits to be improved. In order to do that, the production system has to be characterized. In a next step, a structure for collecting information should be implemented and the animals with the highest breeding values should be identified. Finally, the establishment of an well-organized scheme is necessary for the dissemination of the superior genes through the population, using the animals of high genetic merit.

Economic, social and ecological differences give rise to different breeding objectives. A diversification of breeding goals according to local production environments will support genetic improvement towards locally adapted breeds and also will help the conservation of the diversity of genetic resources.

In Greece, generally the farmers aim at the increase of the commercial milk production and having the lamb as a by-product that contributes to the income derived from the farm. Milk is usually processed to feta and several types of high quality hard cheeses and yogurt. The lambs are

slaughtered after a suckling period of 42 days at an average weight of 14 kg (Georgoudis, 1999). However, the total revenues of the farm and the relative importance of milk and meat vary among the different production systems and breeds.

Among the Greek prolific dairy sheep, Chios breed is a well-known breed for its high milk yield and prolificacy. In this study, the available data from the breed were analysed in order to reach the breeding objective.

Description of the production system

The Chios sheep is spread in Central Macedonia, mainly in Chalkidiki and the region near Thessaloniki. The breed counts about 7000 purebred animals and more than 100,000 upgraded, as it is extensively used for the upgrading of the local populations. The average flock size is about 50-100 heads. Chios breed is early maturing and can be bred at 8-9 months of age (Hatziminaoglu *et al.*, 1996).

The average productive life of the ewe is about 5 years and of the ram about 4 years. Milk yield is about 230 kg per ewe in average, in a milking period of 193 days. The average litter size is 1.8 lambs, while 1.7 lambs are weaned at a live weight of 14.5 kg. Milk recording is carried out in 45 farms counting 5400 heads (77% of the total population). In addition, 20 farms with 2700 animals (13% of the upgraded animals) are under milk control. However, there is no recording on milk composition, somatic cells, economic indexes, health and functional traits. The responsible organizations for the milk recording are the Ministry of Agriculture with the Genetic Improvement Centres and the Chios Breeders' Association. A specific plan for the dissemination of improved genetic material has not been initiated yet (Ministry of Agriculture, unpublished data).

Data from the Agricultural Research Station of Chalkidiki, where a nucleus of the breed is raised since 1977 were used in this study. Moreover, information collected from some private farms has been taken into account. The total number of ewes kept in the Station is 500 heads, where 25% of them are ewe lambs. Ewes are checked for oestrus by teaser-rams and are individually mated. To avoid inbreeding, the rams are used for one reproductive period in the flock and afterwards are sold to other farmers. Two hundred ten lambs are born every 100 lambings and after 42 days 190 lambs, are weaned. Milk production following the suckling period is about 210 kg in 190 days. The best lambs are kept as replacements and potential breeders. Females are used for reproduction, when they reach the age of 6 months and the 60% of the weight of the adult female. The initial number of selected males corresponds to the 20-25% of the females which are kept as replacements. The replacement rate is 25% and about 35% of the lambs weaned are sold to farmers as reproduction animals. The remaining lambs are slaughtered at an average live weight of 14.5 kg (Gabriilidis *et al.*, 1988).

Description of the breeding objective

The genetic parameters of commercial milk yield, litter size and weaning weight have been investigated in previous studies. The heritability of milk yield was estimated at 0.23, of litter size at 0.16 and an equal heritability for weaning weight. However, extremely low genetic correlation (0.03) between commercial milk yield and litter size was estimated (Ligda, *et al.*, 1998; Ligda, 1999). As the three traits contribute to the total income of the farmer, these should be taken into account in deriving the breeding goal of the breed.

From the data available from the Agricultural Station, the total input can be described using the following equation:

$$\begin{aligned} \text{Income} = & \text{No. of ewes milked} * \text{kg milk} * \text{price of milk per kg} \\ & + \text{No. of lambs slaughtered} * \text{kg weight} * \text{price per kg} \\ & + \text{No. of lambs sold for reproduction} * \text{kg weight} * \text{price per kg} \\ & + \text{No. of rams} * \text{kg weight} * \text{price per kg} \\ & + \text{No. of ewes culled} * \text{price per ewe} \end{aligned}$$

Taking into account the average product prices (Table 1) and the above-mentioned relevant technical parameters, the relative contributions of the different sources of income were calculated.

Table 1. Average product prices[†]

Milk (Euros/kg)	0.8
Lambs slaughtered (Euros/kg)	2.7
Breeding animals	
Rams (Euros/ram)	270
Lambs (Euros/lamb)	135
Culled ewes (Euros/ewe)	15

[†]1 Euro = 330 GRD.

The results show that the sales from milk contribute to the total income by 40%, the sales from lambs slaughtered are lower than the 10% and the sales from reproduction animals are about the 50%.

In Table 2, a description of the revenues, cost and profit of some flocks of the Chios sheep in Central Macedonia is presented. As it is indicated in the table, the labour costs are estimated about 15% and the feed costs about 50% of the total cost. Variable costs represent the 27% of the total cost. The profit per ewe is estimated about 35 Euros, when the subsidies are also included. Without taken into account the subsidies, the profit is decreased to 19 Euros.

Table 2. Description of the revenues, cost and profit of the Chios breed (from Kitsopanidis, 1999)

I. Gross revenues/ewe	
1. Milk (%)	69.6
2. Lambs (slaughtered) (%)	30.1
3. Wool	0.3
Total (Euros/ewe)	237
II. Cost/ewe	
1. Labour (%)	14.6
2. Feed (%)	46.6
3. Other	38.8
Total (Euros/ewe)	218
III. Partition of cost	
1. Fixed (%)	72.9
2. Variable (%)	27.1
IV. Profit (Euros/ewe)	
1. Profit	19
2. Profit plus subsidies	35

Discussion

From the results presented, the contribution of the milk is the 40% of the total income, where the income derived from the slaughtered lambs is lower than the 10%. The remaining 50% is covered by the sales of reproduction animals. The fact that one of the main production directions of the Station is to produce and distribute animals of high genetic merit to other farmers explains the lower contribution of milk and meat sales to the total income. As it was pointed out, the results from the commercial

farms, where the live animals sold for reproduction to other farmers are limited to a small number, show that the contribution of milk and meat sales to the total revenues is 70% and 30%, respectively.

These ratios may vary according to the production level of the farm. Some technical and economic data concerning few breeds in Central Macedonia, are presented in Table 3. (Kitsopanidis, 1999).

Table 3. Comparison of the revenues, cost and profit of certain sheep breeds raised in Greece (from Kitsopanidis, 1999)

	Karagouniko	Skopelos	Frisarta	Chios	Lesvos	Mountain breed of Epirus	Serres	Sfakia
Gross revenues/ewe								
1. Milk (%)	68.7	67.4	72.5	69.6	73.0	67.9	57.3	65.9
2. Lambs (%)	31.0	32.3	27.3	0.1	26.6	31.7	42.2	33.8
3. Wool (%)	0.3	0.3	0.2	0.3	0.4	0.4	0.5	0.3
Total (Euros/ewe)	195	220	270	237	115	127	136	140
Cost/ewe								
1. Labour (%)	16.1	14.6	13.0	14.6	20.0	17.6	16.3	15.4
2. Feed (%)	47.1	44.9	48.6	46.6	51.6	51.9	43.9	57.1
3. Other (%)								
Total (Euros/ewe)	169	186	244	218	114	129	140	148
Profit (Euros/ewe)	26	34	26	19	1	-2	-4	-8

The redefinition of the breeding objective after extensive studies of the production and marketing system should be considered. In addition, it is important that traits as the milk composition, somatic cells count or udder characteristics should be recorded. As the cost of recording per ewe is estimated at 18 Euros, it is important to explore the possibilities of the introduction of simplified methods of recording to reduce the labour and the overall organization effort involved (Baltas, personal communication).

References

- Gabriilidis, G., Zervas, N., Hatziminaoglu, J., Georgoudis, A. and Boyazoglu, J. (1988). *The Chios sheep. Data collected at the Station during 1977-1986*. Special Bulletin, Ministry of Agriculture, Agric. Res. Station of Chalikidiki, Greece, p. 25.
- Georgoudis, A. (1999). Small Ruminants Breeding Programmes in Greece: A Case Study for the Workshop on Animal Breeding Strategies. In: *Workshop on Developing Breeding Strategies for Lower Input animal Production Environments*, Bella, Italy.
- Hatziminaoglu, J., Georgoudis, A., Zervas, N. and Boyazoglu, J. (1996). Prolific breeds of Greece. In: *Prolific Sheep*, Fahmy, M.H. (ed.), pp. 73-92.
- Kitsopanidis, G. (1999). Comparative technical and economic analysis of important sheep breeds raised in Greece. In: *15th Annual Meeting of the Hellenic Society of Animal Production*, 3-5 November, Chania, Greece.
- Ligda, Ch. (1999). *Genetic evaluation of the Chios sheep breed with a multitrait animal model*. PhD Thesis, Aristotle University of Thessaloniki (in Greek with English summary).
- Ligda, Ch., Gabriilidis, G., Papadopoulos, Th. and Georgoudis, A. (1998) Genetic evaluation of Chios sheep using a multitrait animal model. In: *49th Annual Meeting of the European Association of Animal Production*. 24-27 August, Warsaw.