OPTIMIZATION OF THE TECHNOLOGIES OF EXPLOITING SHEEP AND GOATS WITH THE PURPOSE OF MAKING THE EXPLOITATIONS MORE VALUABLE

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Abstract

The work aims to respond to the needs of the farmers to optimize their technologies to exploit sheep/goats, in order to increase the productive parameters of the farms, raising the economic efficiency and obtaining competitive products as those made by the farmers from the European Union's countries. It was elaborated a capacity of 150 heads sheep/goats - queen with a free system of maintenance, shelter to which installation for mechanizing the works in sheep/goats breeding and exploitation were installed, in order to raise work productivity, to decrease the costs of production, assuring certain optimal conditions of microclimate, environment protection and assuring the food safety and security of citizens. Before giving the fodders, they had been processed by chopping, grinding, mixing and preparing, operations which determine the raise of alimentary value and palatability of fibrous and gross fodders (fodders from the secondary production, obtained from the cereal crops), the made productive increasing rate was 20-25%, so the expenses beeing justified.

Key words: technologies, mechanization, fibrous fodders, grinding

INTRODUCTION

The optimization of the technologies of exploiting sheep/goats, in order to raise the productive parameters of the farms, raise the economic efficiency, by introducing and expanding the mechanization of works in sheep/goats breeding, especially during the stable period which generally, in Romania lasts for 160 days. During the stable period of sheep/goats is necessary to assure adequate shelters, with proper conditions of microclimate, which to allow the proper development of the animals, establishing certain adequate technological fluxes, assuring the rational valorisation of all the local fodder sources by the various categories of sheep/goats. By increasing the degree of mechanization of the works of preparing and distributing the fodders [1,2], water supplying, gathering the products, evacuation and valuating the dejections, it is also assured the decrease of the physical effort of those who breed exploit such animals. The basic food of sheep/goats is represented by hays and gross fodders, but they can present a reduced palatability due to its high content of cellulose and a low degree of digestibility and from this reason it is recommended that, before administering them, to be chopped, grinded, so that they could be easily mixed with concentrated fodders, mineral salts, pre-mixtures, juicy fodders or with molasses [3,5].

MATERIAL AND METHOD

The researches were made at ICDCOC Palas. The animals from the experimental and witness lots were observed individually and there were registered data regarding: the control of milk production and qualitative determinations of the milk. The control of the milk production was done on the basis of the Romanian method (Nica-Dermengi), which is based on the proportion between the daily milk production and the quantity from a single milking from the same day and it can

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be applied to the whole duration of lactation, monthly or every two months, starting from the first week from dropping (after colostrum period, if the lambs and kids are developed sufficiently, to be able to survive to be separated from their mothers (10 -12 hours).

The maintenance of the sheep/goats was done in the stable for 150-160 days and 205-215 days in the pasture. Foddering during stable period was made with ratios made on basis of fibrous fodders: 32.5% hay, 32.5% gross fodders, warehouse 20% and 15% corn cobs, all chopped, homogenised and moisture with light solution of salt, mixture that was given to the sheep and goats from the experimental lots, and in the first year of experiment at the same lots of animals the same fodders were given, but unprocessed; in the same way it was proceeded in the case of the lots of female sheep and goat youth that were kept for reproduction.

Sheep/goats grazed on the land parcels seeded with a mixture of 70-75% grain plants and 25-30% perennial leguminous, with high degree of consuming, of 94.12%, administering also, in this period, a mixture of 0.5-0.7 kg, consisting in chopped and concentrated hays.

For the qualitative determinations of milk there were used: Gerber method for the fat percentage; Kjeldahl method for the protein percentage; thermosetting method for the percentage of dry substance.

To calculate and systematise the data, usual statistic methods were used.

RESULTS AND DISCUSSIONS

To maintain the sheep/goats it was elaborated a model of shelter for small and medium exploitations with the capacity of 150 heads sheep/goats - queen, with a free system of maintenance, shelter to which installations for mechanizing the works in sheep/goats breeding and exploitation were installed, in order to raise work productivity, to decrease the costs of production, assuring certain optimal conditions of microclimate. The shelter is rectangular, with a total cubage of 770 m^3, with a shelter surface of 234 m^2, with natural airing (surface of evacuating the vice air of 1.6 m^2), with two doors of 2x2.20 m each and seven windows (60x90 cm) provided with a paddock (12x39 m). The solutions for mechanizing the works of maintenance: hammer mill [1,4], drinker with constant level and trough (capacity of the central basin - 75 litres, capacity of a trough - drinker 35 litres, the limits of adjusting the trough height at 30-60 cm), mobile installation of milking, cutting machine (productivity of 40-50 sheep per day), table of sorting wool covers, illuminating installation, mobile installation of washing the sheep. Before administering the de fodders, they had been processed by chopping, grinding, mixing and preparing, operations that determined the increase of the alimentary value and the palatability of the fibrous and gross fodders (fodders from the secondary production, obtained from the cereal crops), the productive increasing rate being 20-25%, so justifying the expenses made.

During the period of gestation (the last two months of gestation) the sheep from all lots were fed with the ratios that were provided during the grazing period 2.32 kg SU, 1.98 UNL, 247 g PDIN, 206 g PDIE, a consumption of 0.85 UNL/ kg SU, 106 g PDIN/Kg SU and 89 g PDIE/kg SU, and during stable period a ratio of 1,71 kg SU, 1.71 UNL, 169 g PDIN and 166 g PDIE, a consumption of 1.0 UNL/kg SU, 99 g PDIN/kg SU and of 97g PDIE/kg SU [6,7].

During the lactation period at sheep it was administered a fodder ratio based on fibrous fodders: 32.5% hay, 32.5% gross fodders, warehouse 20% and 15% corn cobs, all chopped, homogenised and moisture with light solution of salt, mixture that was given to the sheep and goats from the experimental lots, and in the first year of experiment at the same lots of animals the same fodders were given, but unprocessed; in stable period was provided a ratio of 3.63 kg SU, 2.36 UNL, 251.95 g PDIN and 261.06 g PDIE, making a consumption of 0.65 UNL/kg SU, 69.41 g PDIN/kg SU and 71.92 g PDIE /kg SU.

For the goats in the period of gestation (the last two months of gestation) it was used in stable period a fodder ratio with a content of 1.81 kg SU, 1.54UNL, 154 g PDIN and 155 g PDIE, making a consumption of 0,85 UNL/kg SU, 85.08 g PDIN/kg SU and 85.63

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g PDIE /kg SU. For the goats being in the period of lactation, in the stable period, it was provided a ratio of 2.50 kg SU, 1.81UNL, 163 g PDIN and 185 g PDIE, with a consumption of 0.72 UNL/kg SU, 65.20 g PDIN/kg SU and 74.0 g PDIE /kg SU, and in the grazing period a ratio of 2.23 kg SU, 1.87UNL, 241 g PDIN and 197g PDIE, with a consumption of 0.83 UNL/kg SU, 108.07 g PDIN/kg SU and 88.34 g PDIE /kg SU.

It was determined the average total production of milk at sheep and goats through twice-a-month control, after the Nica-Dermengi method (tables 1 and 2). It was also determined the average production of milked milk and the duration of lactation.

Table 1 Average milk production and duration of lactation at sheep

Sheep breed/ administered ratio	n	Total average production of milk (liters)	Average production of milked milk (liters)	Duration of lactation (days)
		X ± s_x V%	X ± s_x V%	
Palas Merino– processed fodders	150	109.51 ± 1.28 14.31	49.61 ± 1.87 46.16	115.91
Palas Merino- unprocessed fodders	150	84.11± 2.41 35.09	25.05 ± 1.01 49.38	96.42
Milk Breed of Palas- processed fodders	150	218.43 ± 3.81 21.36	81.56 ± 1.81 27.17	206.63
Milk Breed of Palas - unprocessed fodders	150	181.16± 2.34 15.81	72.83 ± 1.92 32.28	186.73

Table 2 Average milk production and duration of lactation at goats

Breed of goats/given ratio	n	Total average production of milk (liters)	Average production of milked milk (liters)	Duration of lactation (days)
		X ± s_x V%	X ± s_x V%	
Carpathian/ processed fodders	49	238.01±3.71 10.91	147.42±3.71 17.61	211.44
Carpathian / unprocessed fodders	49	204.49±4.31 14.75	128.47±2.81 15.31	184.65

At the sheep of Palas Merino breed from the lot fed with processed fodders the total production of milk was of 109.51±1.28 liters, with an average production of milked milk of 49.61±1.87 liters, in a lactation which lasted for 115.91 days; at the sheep from the same lot, in the previous year, fed in the stable period with the same ratio, but with unprocessed fodders, the total milk production was of 84.11±2.41 liters, with an average production of milked milk of 25.05±1.01 liters, in a lactation which lasted for 96.42 days. The total milk production at the sheep of Palas Merino to which chopped and processed fodders had been administered was bigger with 30%.

At the sheep of Milk Breed–Palas, from the lot fed with processed fodders, the total production was of 218.43±3.81 liters, with an average production of milked milk of 81.56 ± 1.81 liters, in a lactation of 206.63 days; at the same lot, in the previous year fed in the stable period cu with the same ratio, but with unprocessed fodders, the total milk production was of 181.16±2.34 liters, with an average production of milked milk of 72.83±1.92 liters, in a lactation of 186.73 days.

The total milk production at the sheep of Milk Breed–Palas l to which chopped and processed fodders had been administered was bigger with 20%.

At the goats of Carpathian breed from the lot fed with processed fodders the total production of milk was of 238.01±3.71 liters, the average production of milked milk of 147.42±3.71liters, in a lactation which lasted for 211.44 days, and at the goats from the same lot, in the previous year, fed in the stable period with the same ratio, but with unprocessed fodders, the total milk

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production was of 204.49±4.31 liters, the average production of milked milk of 128.47±2.81 liters, in a lactation which lasted for 184.65 days. The total milk production at the goats of Carpathian breed o which chopped and processed fodders had been administered was bigger with 16%.

It was determined the chemical composition of the milk from sheep and goats (tables 3 and 4), being noted bigger values of the dry substance, of the fat and of the protein at the lots of sheep and goats to which processed fodders had been administered.

Table 3 Chemical composition of sheep milk

Sheep breed/ administered ratio	n	Dry substance %		Fat %		Protein %	
		X ± s_x	V%	X ± s_x	V%	X ± s_x	V%
Palas Merino – processed fodders	150	16.79± 0.22	16.04	6.5 ± 0.11	20.72	6.2± 0.11	21.72
Palas Merino - unprocessed fodders	150	16.51±0.13	9.64	6.3± 0.08	15.55	6.1 ± 0.09	18.07
Milk Breed Palas- processed fodders	150	16.74± 0.15	10.97	6.4 ± 0.09	14.22	6.1 ± 0.11	22.08
Milk Breed Palas - unprocessed fodders	150	16.41± 0.11	8.20	6.3± 0.11	21.38	6.1 ± 0.08	16.06

Table 4 Chemical composition of sheep milk

Goat breed/ administered ratio	n	Dry substance %		Fat %		Protein %	
		X ± s_x	V%	X ± s_x	V%	X ± s_x	V%
Carpathian / processed fodders	49	13.38 ± 0.12	6.27	3.92 ± 0.09	16.07	3.67 ± 0.09	9.44
Carpathian / unprocessed fodders	49	13.25 ± 0.15	7.92	3.43 ± 0.08	16.32	3.41 ± 0.07	14.36

At the male sheep youth, in the stable period, the lambs from the experimental lot had been foddered at discretion, with an unique mixture, in which the proportion of fodders in the ratio's structure was 60% fibrous fodders and 40% concentrated fodders, and the lambs from the witness lot received the same fodder ratio, but the fodders were given unprocessed (the hay was not chopped and the concentrate was given separately). The fodder ratio given to the female sheep youth was of 1.49 kg SU, 1.5 UNL, 209 g PDIN and 166 g PDIE, with a consumption of: 1.01 UNC/kg SU, 140.27 g PDIN/kg SU and 111.41 g PDIE /kg SU. As a result of differentiated foddering regarding the processed and unprocessed administration of fodders to the female sheep youth lots the parameters presented in table 5 were obtained.

Table 5 Evolution of the body weight of the female sheep youth in stable

Breed/Lot	n	Average body weight at weaning (kg)		Average body weight at the age of 7 months (kg)		Weight increase kg)		Daily increasing rate (g)	
		X ± s_x	V%	X ± s_x	V%	X ± s^x	V%	X ± s_x	V%
Palas Merino - experimental lot	49	13.82±0.56	28.36	44.71±1.58	24.73	30.89±1.19	26.96	199.29±7.29	25.60
Palas Merino - witness lot	49	13.87±0.47	23.72	41.35± 1.68	28.44	27.48±1.18	30.05	183.20±7.58	28.96
Milk Breed Palas experimental lot	36	13.39±0.48	21.51	41.76±0.39	5.60	28.37±0.93	19.66	183.03±5.94	19.47
Milk Breed Palas witness lot	36	13.44±0.48	21.42	38.71±2.08	32.23	25.27±1.08	25.64	168.46± 4.58	15.31

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From the table it can be noted that, even in the beginning of the experiment the youth sheep female lots had close average body weights (13.87-13.39 kg), in the end of the experiment, at the age of 7 months differences of weight occur at the experimental lots besides the witness lots. At the lambs of Merinos de Palas breed at the experimental lot the weight was of 44.71±1.58 kg, and at the witness lot of 41.35±1.68 kg, at the lambs of Milk Breed of Palas the weight was of 41.76±0.39 kg at the experimental lot, and the weight at the witness lot was of 38.71±2.08 kg. The differences of weight were: bigger with 8.12% at the lambs of Merinos de Palas breed and with 7.87% at the lambs of Milk Breed of Palas.

As a result of differentiated foddering regarding processed and unprocessed fodders feeding of the female youth goats the parameters presented in table 6 were obtained.

Table 6 Evolution of the body weight of the female youth goats in stable

Breed/lot	n	Average body weight at weaning (kg)	Average body weight at the age of 7,5 months (kg)	Weight increase (kg)	Daily increasing rate (g)
		X ± s_x V%	X ± s_x V%	X ± s_x V%	X ± s_x V%
Carpathian breed – experimental lot	25	12.56±0.52 20.70	33.61± 1.37 20.38	21.05±0.88 20.90	135.80±5.67 20.87
Carpathian breed – witness lot	25	12.78±0.57 22.30	29.17± 1.29 22.11	16.39±0.74 22.57	105.74±4.71 22.27

From the table it can be noted similar body weights in the beginning of the experiment at the two lots of female youth goats (12.56-12.78 kg), at the age of 7.5 months it is emphasised a difference of the body weight. At the kids of Carpathian breed the weight was of 33.61±1.37 kg at the experimental lot, and the weight at the witness lot was of 29.17±1.29 kg. The weight of kids was bigger with 15.22% at the experimental lot besides witness lot.

We made an economic analysis of the sheep exploitation (with a shelter of 150 heads of mother sheep/goats), aiming the economic efficiency in sheep exploitations. Depending on the way in which the prices move on the market the economic result made by the exploitation depends on, related to the expenses done for the make of the specific products. The objective of the strategy of breeding sheep consists in promoting the production on the market, being essential to sell at good prices for the producer, assuring a net profit, bigger and bigger, which to permit the continuation of activity and a decent living.

On the basis of the optimization of technological sequences, introduction of mechanization of the main activities developed for service the sheep, improvement of management and marketing of exploitations, that have as main objective sheep breeding and exploitation, the premises of positive economic results in this field are obtained.

In the case of feeding with chopped and processed fodders, by increasing the fodders' palatability and their degree of digestibility, the productions of exploitation were bigger, obtaining bigger benefits.

CONCLUSIONS

1. It was elaborated a model of shelter for small and medium exploitations, a shelter with capacity of 150 heads sheep/goats queen with free maintenance system.

2. Palas Merino sheep from the lot fed with processed fodders had a total milk production of 109.51±1.28 litres, a production of milked milk of 49.61±1.87 litres, in a lactation of 115.91 days; at sheep from the same lot, fed in stable with the same ratio, but with unprocessed fodders, the total production of milk was of 84.11±2.41 litres, with an average production of milked milk of 25.05±1.01 litres, in a lactation of 96.42 days. The total milk production at the Palas Merino sheep to which unprocessed fodders were given it was bigger with 30%.

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3. At the sheep of Milk Breed – Palas, from the lot fed with processed fodders, the total production was of 218.43±3.81 litres, with a production of milked milk of 81.56±1.81 litres in a lactation of 206.63 days; at the same lot fed in stable period with the same ratio, but with unprocessed fodders, the total production was 181.16±2.34 litres, the production of milked milk of 72.83±1.92 litres, in a lactation of 186.73 days. The total production of milk at the sheep of Milk Breed - Palas to which chopped and processed fodders were given was bigger with 20%.

4. The goats of Carpathian breed had the total production of milk at the lot to which chopped and processed fodders were given of 238.01±3.71 litres, the production of milked milk of 147.42±3.71 litres, in a lactation of 211,44 days, and at the goats from the same lot, but fed in the previous year with the same fodder ratio, but with unprocessed fodders the total milk production was of 204.49±4.31 litres, production of milked milk 128.47±2.81 litres, in a lactation of 184.65 days. The total milk production at the goats of Carpathian breed fed with unprocessed fodders was bigger with 16%.

5. It was determined the chemical composition of the sheep and goats milk (tables 3 and 4), noting bigger values of the dry substance, of the fat and of the protein at the sheep and goats fed with processed fodders.

6. The lambs of Palas Merino from the experimental lot had the weight of 44.71± 1.58 kg, those from the witness lot 41.35± 1.68 kg; at the lambs of Milk Breed Palas the weight was of 41.76±0.39 kg at the experimental lot, the weight at the witness lot of 38.71± 2.08 kg; although in the beginning of the experiment the female youth sheep lots had similar average body weights, in the end of the experiment, at the age of 7 months, the difference of weight at the experimental lots besides those from the witness lots is bigger with 8.12% at the lambs of Palas Merino breed and with 7.87% at the lambs of Milk Breed Palas.

7. The kids of Carpathian breed had the weight of 33.61±1.37 kg at the experimental, lot and at the witness lot of 29.17±1,29 kg; even the kids had similar average body weights in the beginning of the experiment at the age of 7.5 months it is emphasised a difference of the body weight bigger with 15.22% at the experimental lot besides the witness lot.

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