

EVALUATION OF REPRODUCTIVE EFFICIENCY IN TRANSILVANIAN MERINOS SHEEP BASED ON REPRODUCTIVE INDEXES

EVALUAREA EFICIENȚEI ACTIVITĂȚII DE REPRODUCERE A OILOR MERINOS DE TRANSILVANIA PE BAZA INDICILOR DE REPRODUCERE

I. PADEANU¹, C. MIRCUI², S. VOIA¹, I. SAUER³, D. GAVOJDEAN¹, I.
FRĂȚILĂ¹, ARIANA VELCIOV¹,

¹ Faculty of Animal Sciences and Biotechnologies Timișoara, România
ioan_padeanu@yahoo.com

² Faculty of Veterinary Medicine, Timișoara, România

³ S.C.D.C.O.C. Caransebeș, România

The study was carried on 1425 ewes Transilvanian Merinos sheep in the farm belonging to SC Sinnagro SA, Timis country, regarding the reproduction during breeding season and in extra- season. The investigation revealed that these sheep held in good condition do express estrus (88%) during spring-summer (May-June) and are lambing during autumn (82%) with a lower prolificacy (109%). During fall, almost all sheep (98%) displayed estrus, lambing in a proportion of 94,8%, with a prolificacy of 127,1%. The statistical analysis emphasized that all reproductive indexes are higher ($p < 0.01$) subsequent to breeding during normal season, compared to the extra-season, excepting fertility. These findings suggest that Transilvanian Merinos sheep are suitable for generating autumn lambs, for which does exists a great demand abroad.

Keywords: reproduction, reproductive indexes, sheep, Transilvanian Merinos.

Introduction

Nowadays, the crucial objective of sheep breeding is representing the shift of production to European Union demands, for strengthening the Romania's position in international trade.

During the last 15 years, sheep meat production regained its true importance in our country. In order to increase the economical efficiency of family farms – representing 98% of the Romanian sheep owners, the farmers have to obtain as much as possible lambs from one hundred ewes. (Padeanu, 2001).

Reproductive indexes do reflect in the best way the biological and economical efficiency of reproduction in farm animals.

In this paper we intended to evaluate the reproductive activity in Transilvanian Merinos sheep, subsequent to extra-season or breeding season activity, as expressed by reproductive indexes.

Materials and Methods

The study was carried in the farm of SC Sinnagro SRL from Sannicolau Mare, Timis country, where the largest flock (3200 ewes) of Transilvanian Merinos ewes from Romania can be found. This farm is included in OCP system (Official Control of Production) ensuring every year a large number of lambs (1400-1600) for export during fall season and also reproduction rams for the farms of Merinos sheep. The reproductive activity was observed during breeding season and also in the extra-season, and subsequently the following reproductive indexes were calculated: sheep in estrus E% (ewes / breded ewes x 100), pregnancy rate G% (pregnant sheep / breded sheep x 100), index of abortions A% (aborted sheep / pregnant sheep x 100), lambd sheep F% (lambd sheep / ewes x 100), sterility index Sm% (infertile ewes / ewes x 100), prolificacy index Pf% (resulted lambs / lambd ewes x 100), fertility index (resulted lambs / ewes x 100). (Haresing, 1988, Mochnacs, 1978).

Results and Discussion

In order to characterize the reproductive potential of Merinos sheep in the western part of Romania, all reproductive indexes were analyzed during 2008 regarding entire flock of ewes (n = 1736), covering the entire period and respectively the two breeding seasons. The results obtained at programmed natural mating, for entire year, are presented in Table 1.

On the entire period (natural breeding and extra-season breeding), all the reproductive indexes (sheep in estrus -93.02%, fecundity index-96.59%, pregnancy rate-89.98%, abortion index-1.08%, lambd sheep-88.88% and natality-97.86%) ranged in the normal limits for Transilvanian Merinos, excepting prolificacy index (110.11%) which was below normal limit (115%).

Regarding the 193 infertile sheep which did not lambd during entire year, 21.7% were 8 years old, 29.5% were 7 years old, 16.6% - 5 and only 3.7% were 4 years old. These data reflect the fact that after 6 years old, infertility in sheep is rising tremendously and culling would represent the optimal decision. In table 2 are included the reproductive indexes obtained during extra-season mating.

In this respect, during extra-season, a large number of sheep displayed estrus (88%), confirming once more that Transilvanian Merinos sheep, housed in proper conditions do have a longer breeding season, displaying estrus and during spring-summer season (extra-season).

Table 1

Reproductive indexes during entire period (one year)

Ewes 1736	Symbol	100 %
Sheep in estrus (1736/1615)	E %	93,02
Fecundity during entire breeding season (1615/1560 pregnancies)	Fm %	96,59
Abortions (17 abortions/ 1560 pregnancies)	A %	1,08
Pregnancy rate (1560 pregnancies/ 1736 ewes)	G %	89,98
Lambled sheep (1543 lambled sheep/ 1736)	F %	88,88
Sterility (193 sterile sheep/ 1736 ewes)	Sm %	11,12
Prolificacy (1699 lambs/ 1543 lambled sheep)	Pf %	110,11
Natality (1699/1736)	N %	97,86

Table 2

Reproductive indexes during extra-season

Ewes 1425	Symbol	100 %
Sheep in estrus (1254/1425)	E %	88
Fecundity (1178/1254)	Fm %	93,94
Pregnancy rate (1178/1425)	G %	82,66
Abortions (10 / 1178)	A %	0,80
Lambled sheep (1168/1425)	F %	81,96
Sterility (257/1425)	Sm %	18,03
Prolificacy (1273/1168)	Pf %	108,98
Natality (1273/1425)	N %	89,33

Fecundity index during entire breeding season (20th of March- 1st of June) displays a high value (93.94%) similar to that obtained in autumn period.

The obtained pregnancy rate (82.66%) is considered (above the limit of 80%) to be very good subsequent to extra-season breeding, and abortion index has acceptable value (around 1%).

The lambled sheep index, as a consequence of superior indexes of sheep in estrus, fecundity and abortions, is remarkable (81.96%) for lambings during fall.

Prolificacy (108.98%) is satisfactory, but under potential of Transilvanian Merinos (115-130%).

Natality index resulted after extra-season mating (89.33%) is high.

The results from this study reveals that under proper housing and feeding conditions can be obtained during autumn, subsequent extra-season mating, 90 lambs in 100 sheep, exactly when the lambs offer is poor, the demands on extern market and the price are very high.

Padeanu, 1999, reported similar results generated on Transilvanian Merinos sheep, in SDE (University's teaching unit) as follows: natality -79.9% and

prolificacy 108.08%, subsequent to mating during March, at the beginning of extra-season.

A similar research was conducted by Tanase, 1991 (cit. Padeanu, 1999), on Transilvanian Merinos sheep, in IAS Cotnari. Diet was supplemented with concentrates (0.5 kg of grey pea + 0.3 kg of combined concentrates) and teasing rams were introduced between ewes. As a results, during 1st and 30th of March displayed estrus 72.4% from sheep in very good condition (representing 31% from total number), 64.8% from sheep in good condition (57.5%) and only 45.4% from those with an average condition (11.4%).

The reproductive indexes registered in the present study during normal breeding season are contained in table 3.

Table 3

Reproductive indexes obtained subsequent to autumn season mating

Ewes 311	Symbol	100 %
Sheep in estrus (305/311)	E %	98,07
Fecundity (295/305)	Fm %	96,72
Abortions	A %	0
Pregnancy rate (295/311)	G %	94,85
Lambd sheep (295/311)	F %	94,85
Sterility (16/311)	Sm %	5,14
Prolificacy (375/295)	Pf %	127,11
Natality (375/311)	N %	120,57

From totally 1736 sheep, the large majority were mated during spring and lambd in fall, and after culling (mainly infertile sheep – 257), remained 311 ewes, from which 161 lambd during spring and 150 young sheep which were not in proper body condition (weight under 40 kg). These 311 ewes represented the sheep flock for breeding during autumn (normal breeding season).

Comparing the reproductive indexes it appears that during normal breeding season, superior results can be obtained, compared to extra-season breeding. Statistics were calculated using Pearson test (chi square - χ^2).

Regarding the data in table 4 it can be concluded that subsequent autumn mating (the normal season), all the reproductive indexes (sheep in estrus +10.07%, pregnancy rate +12.19%, lambd sheep +12.89%, prolificacy +18.13%, natality +31.24%) are significantly higher ($p < 0.01$) compared to those registered in extra-season, excepting fecundity index which registered more or less similar values (93.94% in extra-season and 96.72% in normal season), the difference of 2.78% being not significant ($p > 0.05$).

Table 4

Statistical significance of reproductive indexes registered in naturally breeding season and extra-season breeding

Reproductive index	Breeding season		N-E difference	Statistical significance
	Extra (E)	Normal (N)		
Sheep in estrus	88,00	98,07	+ 10,07	**
Fecundity	93,94	96,72	+ 2,78	NS
Pregnancy rate	82,66	94,85	+ 12,19	**
Abortions	0,80	0	- 0,80	-
Lambled sheep	81,96	94,85	+ 12,89	**
Sterility	18,03	5,14	- 12,89	**
Prolificacy	108,98	127,11	+ 18,13	***
Natality	89,33	120,57	+ 31,24	***

Note: * p<0,05, ** p<0,01, *** p<0,001

Conclusions

- After extra-season mating (E - May to June), 82% from sheep lambled during fall season (N - October to November), resulting a natality of 90 lambs from 100 sheep.

- The analyzed reproductive indexes (sheep in estrus, pregnancy rate, abortions, lambled sheep, sterility, prolificacy and natality), excepting fecundity, are significantly ($p<0.01$) higher subsequent to breeding in normal season (N), compared to those registered following extra-season mating (E).

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