

IMPROVING THE MILK PRODUCTION AT THE BREEDS AND POPULATIONS OF SHEEP FROM VARIOUS GEO- CLIMATIC ZONES

A. Ida^{1*}, P.G. Vicovan¹, R. Radu¹,
Adriana Vicovan¹, N. Cutova¹, Ana Enciu¹

¹ *The Institute of Research – Development for Sheep and Goat Breeding Palas-Constanța, Romania*

Abstract

The increasing demand for milk and diary products on internal and international markets determines the finding of certain solutions to increase such productions. An important solution is to obtain hybrids between local breeds from various geo- climatic areas and important specialized breeds. This paperwork presents the obtained results from crossbreeding of some effectives of local sheep from breeds like Milk Breed-Palas, Prolific Line-Palas, Țigaie, Țurcană, breed with rams from breeds specialized for milk production, Lacaune and Awassi. There were evaluated and compared under the aspect of total milk production and milked milk, the F₁ hybrid sheep from the 5 obtained genotypes (lots of prim pars) with the local breeds (lots of prim pars). Four out of 5 obtained hybrids made at the first lactation a quantity of total and milked milk, significantly bigger than the local breeds. The obtained F1 hybrids, with productions which were superior to the local breeds will be the first links for certain new populations (lines, breeds) specialized for milk.

Key words: improvement, milk, sheep

INTRODUCTION

The improvement and exploitation of sheep for the milk production on international and international level gains a bigger and bigger importance in the context of the high demand on the market for this product. The higher and higher interest for this production makes that, in European countries as France, Spain, Italy, the activity of improvement to face a higher development.

The activity of improving the sheep for milk production from France and Spain can also offer solutions for improving the local sheep breeds.

In our country, researches regarding the use of hybridizing with the purpose of improving the local breeds for milk were developed by A. Ionescu (1979) and P.G. Vicovan (2003).

The purpose of works is to make certain sheep populations with big milk productions adapted to the specific breeding conditions from our country by testing the capacity to be

combined the sheep of local breeds with breeds specialized for milk.

MATERIAL AND METHODS

The work has been developed on the sheep effectives from the partner research units, effectives of different breeds which were bred different geo-climatic areas.

The research units being involved in the research activities on geo-climatic areas were the following:

- Institute of Research-Development for Sheep and Goat Breeding Palas-Constanța
- Station of Research-Development for Sheep and Goat Breeding Secuieni-Bacău
- Station of Research-Development for Sheep and Goat Breeding Bilciurești
- Station of Research-Development for Sheep and Goat Breeding Caransebeș

The experimental sheep effectives organized on breeds and partners for the developed works are presented in table 1.

The F₁ hybrid sheep (lots of prim pars) were evaluated under the aspect of total milk production and milked milk, comparatively to the local breeds (lots of prim pars). This

*Corresponding author: aurelianida@yahoo.com

The manuscript was received: 15.03.2012

Accepted for publication: 06.05.2012

evaluation was made on the basis of the milking capacity of the hybrid sheep and of those from local breeds (of the total increasing rate of the lambs during the milking period and of the total consumption of milk used to make a kilogram of weight increasing rate). The obtained data were used to establish the

total milk production of the hybrid sheep at the first lactation period comparatively to the maternal local breeds. The total quantity of milked milk was established on the basis of the data obtained at 4 monthly controls effected according the methodology established by MADR-ANARZ.

Table 1 The experimental effectiveness of sheep on breeds and partners

Specification	Unit			
	ICDCOC Palas-Constanța (n)	SCDCOC Secuiei-Bacău (n)	SCDCOC Bîlcurești (n)	SCDCOC Caransebeș (n)
Prim par sheep- experimental lots				
F1 Milk Breed-Palas x Lacaune	32	-	-	-
Milk Breed -Palas	37	-	-	-
F1 Prolific Line-Palas x Lacaune	47	-	-	-
Prolific Line -Palas	28	-	-	-
F1 Țigaie x Awassi	-	44	-	-
Țigaie Breed	-	38	-	-
Țigaie x Lacaune	-	-	47	-
Țigaie Breed	-	-	44	-
F1 Țurcană x Lacaune	-	-	-	42
Țurcană breed	-	-	-	35

The obtained data were statistically processed, testing also the differences between the half-breed sheep and the local breeds by Fisher test for the analyzed characters.

RESULTS AND DISCUSSIONS

Establishing the total milk production of sheep

The total milk productions of the F₁ hybrid sheep and of the sheep from local breeds are presented in table 2.

Table 2 The total milk productions of the F₁ hybrid sheep, comparatively to the local breeds

Nr.	Genotype	Total production (liters/head)	Duration of lactation (days)	Differences between F ₁ sheep and local breeds		
		X ± sx		± liters /head	± %	Signification
1.	F ₁ Lacaune x Milk Breed	237.05±11.8601	241	-4.74	-2.0	p > 0.05
2.	Milk Breed-Palas	241.79±16.7522	254			
3.	F ₁ Lacaune x Prolific Line	176.43± 8.9779	239	+29.5	+20.1	p < 0.05
4.	Prolific Line -Palas	146.78± 9.9929	246			
5.	F ₁ Awassi x Țigaie	218.00± 4.7548	245	+85.6	+ 64.6	p < 0.001
6.	Țigaie Breed	132.43± 2.4786	244			
7.	F ₁ Lacaune x Țigaie	136.12± 3.8165	247	+51.99	+ 59.7	p < 0.001
8.	Țigaie Breed	87.13± 1.5049	233			
9.	F ₁ Lacaune x Țurcană	152.74± 3.6374	230	+35.82	+ 30.6	p < 0.001
10.	Țurcană Breed	116.92± 2.1695	230			

The comparative analysis of the F₁ hybrid sheep and of the local sheep, revealed the fact that there are significant and very significant differences between the total milk productions, at the first lactation. The exception from this

rule are the F₁ hybrid sheep (Lacaune x Milk Breed-Palas), studied at I.C.D.C.O.C. Palas-Constanța, at whose milk production was smaller with 2% besides the production of the sheep from Milk Breed-Palas.

The obtained results regarding the total milk production reveals the fact that the rams from the specialized breeds which were used in crossbreeding had a general improving effect upon the local breeds and determined superior productions of milk.

Establishing the average daily milk production of sheep

In table 3 the average daily productions of milk of the F₁ hybrid sheep and of the sheep from local breeds are presented for comparison.

Table 3 The average daily milk productions at the F₁ hybrid sheep, comparatively to the local breeds

Nr.	Genotype	Average daily production of milk (liters/head)	Differences between the F ₁ sheep and local breeds		
		X ± sx	± liters/head	± %	Signification
1.	F ₁ Lacaune x Milk Breed	0.98±0.0444	+ 0.03	3.2	p > 0.05
2.	Milk Breed-Palas	0.95±0.0610			
3.	F ₁ Lacaune x Prolific Line	0.740±0.0369	+ 0.143	+ 24.0	p < 0.05
4.	Prolific Line -Palas	0.597±0.0387			
5.	F ₁ Awassi x Țigaie	0.89±0.0185	+ 0.35	+ 64.8	p < 0.001
6.	Țigaie Breed	0.54±0.0102			
7.	F ₁ Lacaune x Țigaie	0.551±0.156	+ 0.179	+ 48.1	p < 0.001
8.	Țigaie Breed	0.372±0.0078			
9.	F ₁ Lacaune x Țurcană	0.66±0.0158	+ 0.15	+ 29.4	p < 0.001
10.	Țurcană Breed	0.51±0.0094			

The calculus of the average daily production of milk revealed the fact that four out of the five F₁ hybrids had an average daily production of milk which was superior comparatively to the sheep from local breeds, registering significant differences between them.

Establishing the average production of milked milk of the sheep

In table 4 the productions of milked milk of the F₁ hybrid sheep and of the local sheep are presented.

The difference between the total productions of milked milk at the prim pars sheep from Milk Breed-Palas and the F₁ hybrid sheep Lacaune x Milk Breed, revealed the fact that even the Milk Breed-Palas made a quantity of milked milk bigger with 7.1% besides the hybrid sheep of Lacaune x Milk Breed, the registered differences were not significant.

The F₁ hybrid sheep (Lacaune x Prolific Line-Palas) made a production of milk bigger with 19.2% besides the Prolific Line -Palas.

The quantity of milked milk of the F₁ hybrid sheep (Awassi x Țigaie) at the first lactation was of 162.44±4.9408 liters in a milking period of 154 days. This production was bigger with 103% besides the production of Țigaie breed (80.0±1.6634 liters), the registered differences being very significant.

The F₁ hybrid sheep (Lacaune x Țigaie) had an average production of milked milk bigger with 89.9% (very significant differences) besides Țigaie breed.

The F₁ hybrids (Lacaune x Țurcană) had a production of milked milk of 94.50±1.4628 liters, a production bigger with 37% besides Țurcană breed, at which the quantity of milked milk was of 69.0±0.9613.

The quantity of milked milk of the F₁ hybrid sheep (at four from the five hybrids) at the first lactation was superior to that of sheep from maternal local breeds and, consequently there are significant and very significant differences between them.

Table 4 The production of milked milk at the F₁ hybrid sheep comparatively to the local breeds

Nr.	Genotype	Total production of milked milk (l/head)	Period of milking (days)	Differences between F ₁ sheep and local breeds		
		X ± sx		± l/head	± %	Signification
1.	F ₁ Lacaune x Milk Breed	166.90±13.3284	167.58	- 12.8	- 7.1	p > 0.05
2.	Milk Breed-Palas	179.70±16.5197	180.61			
3.	F ₁ Lacaune x Prolific Line	104.50±9.3939	165.83	+16.84	+19.2	p < 0.05
4.	Prolific Line -Palas	87.66±8.4828	172.60			
5.	F ₁ Awassi x Țigaie	162.44±4.9408	154	+82.44	+103.0	p < 0.001
6.	Țigaie Breed	80.0±1.6634	155			
7.	F ₁ Lacaune x Țigaie	78.08±3.5231	177	+36.97	+ 89.9	p < 0.001
8.	Țigaie Breed	41.11±0.3422	163			
9.	F ₁ Lacaune x Țurcană	94.50±1.4628	150	+ 25.5	+ 37	p < 0.001
10.	Țurcană Breed	69.00±0.9613	246			

Establishing the average daily production of milked milk of the sheep

In table 5 the average daily productions of milked milk of the F₁ hybrid sheep and of

the sheep from the local breeds are presented comparatively.

Table 5 The average daily production of milked milk at the F₁ hybrid sheep, comparatively to the local breeds

Nr.	Genotype	Average daily production of milked milk (l/head/day)	Differences between F ₁ sheep and local breeds		
		X ± sx	± l/head	± %	Signification
1.	F ₁ Lacaune x Milk Breed-Palas	0.98±0.0757	- 0.01	- 1.0	p > 0.05
2.	Milk Breed-Palas	0.99±0.0838			
3.	F ₁ Lacaune x Prolific Line	0.629±0.0531	+ 0.121	+ 23.8	p < 0.05
4.	Prolific Line -Palas	0.508±0.0489			
5.	F ₁ Awassi x Țigaie	1.06±0.0297	+ 0.54	+ 104.0	p < 0.001
6.	Țigaie Breed	0.52±0.0110			
7.	F ₁ Lacaune x Țigaie	0.441±0.0200	+ 0.188	+ 74.3	p < 0.001
8.	Țigaie Breed	0.253±0.0022			
9.	F ₁ Lacaune x Țurcană	0.63±0.0099	+ 0.17	+ 37.0	p < 0.001
10.	Țurcană Breed	0.46±0.0064			

The average daily quantity of milked milk from the F₁ hybrid sheep was generally superior to the maternal local breeds, the differences being significant and very significant.

An overall view on the milk production obtained at the F₁ hybrid sheep between Lacaune breed and Țigaie, Țurcană breeds, Prolific population-Palas and those between Awassi breed and Țigaie shows that all hybrid sheep made total production of milk

and merchandise significantly bigger besides the maternal breeds.

The obtained results emphasized that through crossbreeding between Lacaune and local breeds (Țigaie and Țurcană) the imported breed has an improving effect upon milk production, thus crossing represent a method to enhance the milk production for these breeds.

For the 2 genotypes studied at I.C.D.C.O.C. Palas-Constanta (F₁ Lacaune x

Milk Breed and Milk Breed-Palas), the daily average quantity of milked milk was similar, differences between them being non-significant statistically.

CONCLUSIONS

The Lacaune and Awassi breeds used at crossbreeding had an improving effect on the milk production, 4 from the 5 genotypes obtained made at the first lactation total quantity of milk significantly bigger than the maternal breeds.

The general conclusion is that by crossbreeding with milk breeds the production of the hybrid sheep F_1 increases significantly since the first generation of hybrids, comparatively to the local breeds of sheep. The method of improvement by crossbreeding is rapid and efficient comparatively to the

method of improving the milk production by breeding in pure breed.

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