

Performance of crossbreds of Polish Merino dams with F₁ rams: Finnsheep × Polish Merino. C. Preliminary results of reproductive performance of ewes

M. OSIKOWSKI, B. BORYS and M. A. OSIKOWSKI

*Institute of Zootechnics, Experiment Station Kołuda Wielka,
88-160 Janikowo, Poland*

Abstract. The investigations were carried out on the basis of the first three reproductive cycles of ewes born in the same year. The experimental flock consisted of 100 ewes — progeny of Polish Merino (PM) dams and F₁ rams: Finnsheep (F) × PM; there were also 32 purebred PM used as controls. The crossbred ewes, with 25 % of F genotype, had a much better reproductive performance (117 % vs. 96 % in the PM), mainly due to a much higher prolificacy (152.2 vs. 133.6 %) and improved fertility (by 3.1 %) and the percentage of lambs weaned (higher in the crossbreds by 3.4 %).

Index words: Finnsheep, Polish Merino, crossbreeding, fertility, prolificacy, stillbirths, weaning-%

Introduction

The Polish Merino (PM), as well as other sheep breeds and types in Poland, has a relatively low prolificacy of about 130 % (3). At present, studies are carried out to improve its prolificacy, both through breeding and selection methods (4) and through commercial crossbreeding with prolific breeds (2, 7). At the same time an attempt was made to develop a wool-prolific line which would produce merinotype wool, through introducing a limited proportion of F genotype to the PM. In the present study, an analysis of reproductive performance of ewes with 25 % F genotype

(progeny of PM dams with F₁ rams F × PM) is presented.

Materials and methods

The experimental flock consisted initially of 100 crossbred ewes (F × PM × PM), and the control group of 32 purebred PM ewes. The first mating took place in June/July 1985 (reproductive cycle I, at the age of about 18 months); the second one (cycle II) in June/July 1986, and the third one (cycle III) in February/March 1987. Starting with cycle II both groups of ewes entered the system of 3 matings in 2 years (i.e. every 8th months).

The crossbred ewes were mated to meat rams: in cycles I and II, Polish Blackheaded (PB), Ile de France (IF) and Berrichon du Cher (B), and in the third cycle only to Berrichon rams. Purebred PM ewes were mated to PM rams. In cycles I and II no selection was carried out, but before the cycle III culling was performed, mainly due to infertility, udder diseases and low wool yield. The ewes and their progeny were fed farm-produced feed-stuffs, supplemented by concentrate and mineral mixtures according to the standards of the Institute of Zootechnics (6).

Lambs were weaned in cycle I at 100 days, and in cycles II and III at 56 days. Body weight of ewes before mating, fertility and prolificacy, percent of stillborn and weaned lambs were recorded and the number of lambs weaned per 100 ewes mated was calculated. The results were analysed by arithmetic means of the above parameters; for ewe body weights statistical significance was variance analysed according to Ruszczyk (8).

Results and discussion

No differences were observed in body weight of ewes of the tested groups at 18 months, before the first mating (table 1), which indicates that the ewes were in the same stage of development at the moment when they began reproduction. There were, however, considerable differences in ewe body weight before the second and third mating; in both cases the crossbreds were heavier — by 6.9 and 8.7 %, respectively ($P \leq 0.01$). Further research is needed to explain these differences, but taking into account the better reproductive performance of the crossbreds (higher percentage of lambs weaned) it can be supposed that their vitality and feed conversion were better than of the purebred PM.

In all the three reproductive cycles taken together, the crossbred ewes performed better — on the average by 3.1 %. There was, however, much variation between the cycles: in cycles I and II the crossbreds had a better performance — by 2.6 and 11.2 % respectively,

while in cycle II it was the purebred PM which had 4.5 % higher reproductive performance.

The effect of 25 % F genotype on prolificacy was positive. The crossbreds were more prolific than the purebreds in all three reproductive cycles (on the average by 22.6 %). It should be noted, however, that while in the cycles I and II the difference was not very considerable (16.5 and 15.6 % respectively), in cycle III the crossbreds were superior to purebreds by 35.6 %. On the whole the results seem to confirm the assumption that this system of crossbreeding with the F would increase ewe prolificacy by 20—25 % in comparison to purebreds, i.e. less than half of the superiority achieved when PM ewes are mated directly to F rams (7). This is confirmed by authors from other countries who compared the effect of different percentage of F genotype on prolificacy of crossbred ewes (1, 5). The considerable differences in fertility and prolificacy observed between the tested groups in the 3rd cycle (mating February/March) may indicate that reproductive ability of the crossbreds is less seasonal than that of purebred PM.

Mating of the crossbred ewes to meat rams caused large diversity in their fertility and prolificacy in the three reproductive cycles (table 1). It is, however, difficult to draw conclusions about any clear influence of the meat breeds on reproductive traits of ewes from the results obtained from the three cycles.

The differences in percent of stillborn lambs do not indicate any significant effect of crossbreeding with F. In both genetic groups this percentage was much higher in cycle III, which could have been caused by shortening the »open» period from 7 months (between cycles I and II) to 3 months (between cycles II and III), due to the introduction of the system of three matings in two years.

The percentage of lambs weaned in cycles I and II was similar in both groups, while the results of cycle III were significantly affected by a series of sudden lamb deaths caused by a bacterial infection of the respiratory and digestive tract. On the whole the differences

Table 1. Reproductive performance of F×PM×PM ewes in comparison to purebred PM ewes.

Trait	Ewe breed Ram breed Reprod.cycle	F×PM×PM				PM
		PB	IF	B	PB + IF + B Total	PM
No. of ewes	I	36	29	35	100	32
	II	27	27	28	82	25
	III	—	—	65	65	23
Body weight before mating (kg)	I	49,1	51,5	50,6	50,3	50,6
	II	56,9	57,2	57,6	57,3 ^A	53,6 ^B
	III	—	—	53,9	53,9 ^A	49,6 ^B
Fertility (%)	I	88,9	96,6	94,3	93,0	90,6
	II	96,2	88,9	89,3	91,5	96,0
	III	—	—	93,8	93,8	82,6
Average	I, II i III	92,5	92,7	92,5	92,8	89,7
Prolificacy (%)	I	150,0	153,6	130,3	144,1	127,6
	II	161,0	141,7	168,0	157,3	141,7
	III	—	—	167,2	167,2	131,6
Average	I, II i III	155,7	147,6	155,2	156,2	133,6
% of stillborn lambs	I	4,2	2,3	0,0	2,2	0,0
	II	4,8	0,0	0,0	1,7	0,0
	III	—	—	6,9	6,9	8,0
Average	I, II i III	4,5	1,1	2,3	3,6	2,7
% of lambs weaned ¹	I	91,3	78,6	88,4	86,3	83,8
	II	85,0	91,2	80,9	85,3	88,2
	III	—	—	80,0	80,0	69,6
Average	I, II i III	88,1	84,9	83,1	83,9	80,5
No. of lambs weaned per 100 ewes mated ¹	I	117	114	109	113	97
	II	126	115	121	121	120
	III	—	—	117	117	70
Average	I, II i III	121	114	116	117	96

¹ lambs were weaned in the first cycle after 100 days and in the second and third cycle — after 56 days.

in the percentage of lambs weaned can be disregarded.

The reproductive index of the crossbred ewes was much better than that of the purebreds in cycles I and III (by 16 and 47 % respectively), while in cycle II the two groups of ewes had nearly the same index values. The mean superiority of the crossbred ewes in all three reproductive cycles was 21 %.

There was no effect of mating to rams of different meat breeds on the percentage of stillborn and weaned lambs and on the

reproductive index of the crossbred ewes.

Conclusion

The analysis of reproductive traits of F×PM×PM ewes has shown that crossbreds with 25 % F genotype have a better reproductive performance than purebred PM (by 21 % on average), which is mainly due to higher prolificacy (by 22.6 %) together with slightly improved fertility (by 3.1 %) and lamb weaning rate (by 3.4 %).

References

1. DROŻDŹ, A., 1988. *Owczarstwo* 1, 5—7.
2. GUT, A., KOZAL, E. & GRAJCAK, L. 1986. *Zeszyty Problemowe Postępów Nauk Rolniczych*, z. 303, 39—45.
3. KIERUBIŃSKA, Z. 1987. *Owczarstwo* 9, 3—8.
4. KRUPIŃSKI, J. & RZEPECKI, R. 1987. *Prace hodowlane Instytutu Zootechniki i ich wpływ na rozwój owczarstwa krajowego. Materiały konferencyjne Gdańsk, październik*, 28—29.
5. MAIJALA, K. 1979. Experiences of Finnsheep and its crosses as dams for fat lambs. *Symp. Intensive Sheep Prod.*, Helsinki, 2—9.
6. *Normy żywienia zwierząt gospodarskich*, 1982. PWRiL Warszawa.
7. OSIKOWSKI, B. & BORYS, B. 1986. *Przegląd Hodowla*ny 6, 8—13.
8. RUSZCZYC, Z. 1978. *Metodyka doświadczeń zootechnicznych*, PWRiL Warszawa.