JOURNAL OF AGRICULTURAL SCIENCE IN FINLAND
Maataloustieteellinen Aikakauskirja
Vol. 60: 546—548, 1988

Performance of crossbreds of Polish Merino dams with F_1 rams: Finnsheep × Polish Merino. B. Wool production 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 wool of 180 non-selected ewes with 25 % Finnsheep (F) genotype (F × PM × PM) and 51 purebred Polish Merino (PM) ewes as controls. The shearing took place at 23 months of age, after a year's growth of fleece. Greasy and clean wool production, length and diameter of fibres as well as wool character evaluated by subjective appraisal were recorded. Crossbred ewes had a slightly lower greasy wool production (F × PM × PM—4.0 kg, PM—4.3 kg), but a much higher rendement (60.2 and 51.2 % resp.) and a little higher clean wool yield — 2.38 versus 2.20 kg. Wool of the crossbreds was longer (11.4 vs 10.5 cm) and coarser (24.8 vs 23.9 μm), but had a poorer character 14.9 vs 16.0 points.

Index words: Finnsheep, Polish Merino, crossbreeding, wool production, fibre length, fibre diameter, greasy wool

Introduction

Mating Polish Merino (PM) ewes to Finnsheep (F) rams, in addition to the main objective of improved reproduction, affects also their wool production (1, 3). A series of trials have been initiated on the effects of two-stage commercial crossing of PM with F_1 rams: F × PM, and on the development of a new wool-prolific line of Merino-type sheep through introducing a limited proportion of F genotype to the PM. The investigations include also the analysis of wool production of ewes with 25 % F genotype.

Materials and methods

Wool of 180 crossbred ewes (F × PM × PM) and 51 purebred PM ewes was analysed. Non-selected ewes born in 1984 and 1985 were sheared at the age of 23 months, after 12-month growth of fleece. Housing and feeding conditions within the same year were identical in the both genetic groups. The ewes were fed according to the Institute of Zootechnics standard (2), with farm-produced roughage supplemented by commercially available concentrates.

The recorded data included: greasy and

clean wool yield, rendement, fibre length and diameter analysed in a laboratory on samples taken from the side, as well as wool character subjectively evaluated in the whole fleece on a 20-point scale, as a sum of the following traits: evenness of assortment (maximum score 5 points), stapling (max. 4), handle (max. 3), crimp (max. 5) and yolk (max. 3). On the basis of laboratory analysis of fibre diameter, the percentage of fleeces in assortments A and B (typical for the PM) was calculated.

The computations were carried out on the basis of arithmetic means and coefficient of variation as well as double factor variance analysis (breed and year) according to RUSZCZYC (4).

Results and discussion

Crossbred ewes produced less greasy wool than purebreds (table 1) — the difference was 0.3 kg, i.e. 7.5 % ($P \leqslant 0.05$). Their wool had, however, considerably higher rendement (by 9.0 %, $P \leqslant 0.01$) and, in effect, their clean wool yield was 0.18 kg (8.2 %, $P \leqslant 0.05$) higher than that of the purebreds. At the same time much variation was observed between the years of birth. Ewes born in 1985 had a much higher greasy wool production, while those born in 1984 had a higher rendement; in effect, clean fleece weight was similar for both years. The significant interaction breed × year of birth in rendement was due to the fact that in 1984 the difference in rendement between

Table 1. Wool performance of crossbred ewes (FnPM × PM) compared to purebred PM ewes.

Trait	Statistical parameters	Breed		Year of birth		Interaction breed × year of birth
		F × PM × PM	PM × PM	1984	1985	
No. of ewes	n	180	51	129	102	
Greasy wool (kg)	$\bar{x}$	4.0[a]	4.3[a]	3.8[A]	4.5[A]	—
	V%	20.3	20.8	19.5	17.0	
Clean wool (kg)	$\bar{x}$	2.38[a]	2.20[a]	2.34	2.34	—
	V%	19.8	20.5	21.4	18.8	
Rendement (%)	$\bar{x}$	60.2[A]	51.2[A]	62.6	52.7	×
	V%	14.6	13.7	13.2	13.6	
Fibre length (cm)	$\bar{x}$	11.4[A]	10.5[A]	11.0	11.2	×
	V%	19.1	17.0	21.0	17.1	
Fibre diameter (µm)	x	24.8[A]	23.9[A]	24.4[A]	24.9[A]	—
	V%	8.3	8.8	8.6	8.7	
Wool character score						
— evenness of assortment	$\bar{x}$	4.0[a]	4.2[a]	4.2[a]	3.9[A]	—
	V%	21.1	15.8	19.6	20.7	
— stapling	$\bar{x}$	2.9[a]	3.2[a]	3.0	3.0	—
	V%	36.2	28.0	34.4	34.8	
— handle	$\bar{x}$	2.0[A]	2.5[A]	2.2	2.0	—
	V%	41.7	26.7	38.4	40.4	
— crimp	$\bar{x}$	3.4	3.5	3.6	3.3	—
	V%	28.4	25.1	25.6	30.0	
— yolk	$\bar{x}$	2.6	2.6	2.7	2.6	—
	V%	21.6	18.5	21.6	19.8	
Total score	$\bar{x}$	14.9	16.0	15.6	14.7	—
	V%	23.4	17.4	21.7	22.1	
% of ewes with fleeces in assortments A and B	%	82.8	92.2	84.3	87.3	

aa—$P \leqslant 0.05$
AA—$P \leqslant 0.01$
x—interaction significant at $P \leqslant 0.05$

crossbreds and purebreds was much greater than in 1985 (10.6 vs. 5.8 %).

Crossing with F considerably increased fibre length and diameter. Wool of the crossbred ewes was 12.2 % longer and 3.8 % coarser than that of the purebreds (table 1); both differences significant at $P \leqslant 0.01$. Differences between ewes born in 1984 and 1985 were much smaller, although significant for fibre diameter. The interaction in fibre length was significant, because it varied between the genetic groups much more in 1984 than in 1985 (1.9 vs. 0.4 cm). The increase in fibre diameter found in the crossbreds is also associated with a smaller percentage of wool in assortments typical for the PM — by 9.4 % lower than in the purebreds (table 1).

Results of subjective appraisal of wool character indicate a slight negative effect of crossbreeding with F (table 1). Fleeces of the PM had higher scores for evenness of assortment, stapling and handle — by 6.3, 9.9 and 26.1 % respectively (signif.). Scores for crimp and yolk were similar in the both groups. The total score of PM fleeces was 7.2 % higher ($P \leqslant 0.05$) than that of the crossbreds. There was no difference between ewes born in different years in wool character, except for evenness of assortment which was 8.0 % higher ($P \leqslant 0.01$) in ewes born in 1984.

The variation within the crossbred groups for such traits as greasy and clean wool yield, rendement and fibre diameter was not greater than the variation within the purebred PM groups. In fibre length and wool character, however, there was more variation within the crossbred groups.

In general, the differences in wool performance of ewes with 25 % F genotype, in comparison to purebred PM, were not very great and, as was expected, much smaller than those observed in F_1 ewes $F \times PM$ (3).

Conclusion

The analysis of wool performance of crossbred ewes ($F \times PM \times PM$) did not show any considerable difference in wool yield (greasy wool production a little lower than in purebreds, clean yield a little higher), but the differences in wool quality and character were more pronounced: greater rendement, fibre length and diameter but lower character score. In sum, relatively small reduction in the percentage of fleeces classified in assortments typical for purebred PM was observed — 9.4 %.

References

1. Maijala, K., 1979. Experiences of Finnsheep and its crosses as dams for fat lambs. Symposium on Intensive Sheep Production. Helsinki, 2—9.
2. Normy żywienia zwierząt gospodarskich, 1982. PWRiL Warszawa.
3. Osikowski, M., Borys, B. & Korman, K., 1981. Dwustopniowe krzyżowanie towarowe owiec merynosowych z trykami ras plennych i mięsnych. Sprawozdanie z realizacji tematu PR-4, 4712.3. IZ Kraków, ZZD Kołuda Wielka.
4. Ruszczyc, Z., 1978. Metodyka doświadczeń zootechnicznych. PWRiL Warszawa.