GENETICA POLONICA
Vol. 12, 1971, No. 4

PHENOTYPIC AND GENETIC CORRELATIONS OF SOME TRAITS IN ROMNEY MARSH SHEEP[1]

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Investigations have been carried out on Romney Marsh (Kent) sheep, a breed of great importance in the improvement of Polish long-wool sheep.

The main purpose of these experiments is to establish the selection index for Polish Kents. As yet, this breed has been genetically analysed in Poland, and only partially abroad. Heritability and correlation between traits in the other breeds, especially in Merino sheep, were the subject of many investigations. Most important works were carried out by Manson and Dasset (1958), Morley (1955), Shelton (1959), Trygve Gjedren (1960), Brown and Turner (1968) and other authors. In Poland, tests on Merino sheep were initiated by Kamiński, Knothe and Staliński (1960) and continued by Staliński and Knothe (1960, 1961), Nawara (1960), Radomska (1965).

MATERIALS AND METHODS

Present investigations were carried out in three Kent pedigree flocks (Waplewo, Lubiana, Babkowice) and respective ewes born in 1963 - 1967. Data were collected from about 540 ewes.

The level of tested traits was high and very high (e.g. III shear fleece weight — 5.77 kg $\pm$0.92, body weight at 12 months 62.6 kg $\pm$7.25). Heritability coefficients for all of the examinated traits were calculated by the analysis of variance between half-sisters; coefficients of phenotypic correlation, by co-variance eliminating the variation between flocks and years, and variation between half-sisters.

Results concerning nine of the examined traits are given in this report in Tables 1 and 2.

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[1] Report delivered at Symposium III of the Polish Genetics Society. The paper is to be published *in extenso* in Genetica Polonica.

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Table 1. Heritability coefficients of examinated traits

Trait	Degrees of freedom				h^2
	total	flocks	years	sires	
1. Weaning body weight kg	541	2	12	50	0.612
2. 10 months body weight kg	343	2	7	34	0.015
3. 12 months body weight kg	472	2	10	42	0.142
4. Fleece I weight kg	541	2	12	50	0.002
5. Fleece II weight kg	541	2	12	50	0.324
6. Fleece III weight kg	541	2	12	50	0.367
7. Body points	541	2	12	50	impossible to calculate
8. Wool points	539	2	12	50	0.516
9. Technological fleece evaluation	414	2	10	45	0.062

Table 2. Phenotypic and genetic correlations

Between traits	n	r_p	r_g
1. Weaning body weight—12 months body weight	473	0.231	uncalculated
2. Body weight 10 months—12 months	344	0.929	,,
3. Fleece weight, shear I—shear II	542	0.040	,,
4. Fleece weight, shear I—shear III	542	0.018	,,
5. Fleece weight, shear II—shear III	542	0.022	0.650
6. 12 months body weight—body points	473	0.398	uncalculated
7. 12 months body weight—fleece III	473	0.149	1.000
8. Fleece III weight—wool weight points	540	0.084	uncalculated
9. Fleece III weight—technological fleece evaluation	415	0.034	,,

DISCUSSION

Evaluated heritability coefficients are similar to the h^2 calculated for Waplewo flock by Radomska (1970) on the basis of data of earlier years, yet they differ rather significantly from unpublished Nawara's results in respect of Polish Merino sheep. h^2 of body weight in Merino at the age of 10 days was much lower, yet higher at the age of 10 months. Similar results were obtained in respect of shear II fleece weight.

Heritability coefficients evaluated in this study indicate the possibility of basing mass selection on wool production at shear II. Calculated coefficients of phenotypic correlation are much similar to reported data. They indicate a very high correlation between body weight at the age of 10 and 12 months, suggesting the possibility of an earlier ending of the control of body measurements of Kents.

Genetic correlation has not been calculated in respect of most of the examined traits. For example the result of calculations are higher than ± 1.0.

The situation well characterizes the difficulties as regards calculations of genetic parameters, arising from the Polish breeding conditions e.g. low numbers of sheep in flocks (usually about 300 ewes per flock).

The small number of flocks in Polish Kents (ten pedigree flocks, some of them without full documentation) fails to provide grounds for a calculation of genetic correlation.

One of the few calculated coefficients,viz. the high and correct coefficient of genetic correlation between fleece weight at shear II and III, indicates the opportunity for hastening selection of ewes on the basis of wool production.

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