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## THE GENETIC PARAMETERS FOR GROWTH TRAITS IN ABERDEEN ANGUS BREED USING RANDOM REGRESSION MODEL

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The aim of present study was the estimation of the genetic parameters for growth traits in Aberdeen Angus beef cattle breed with random regression model. The records were the body weight at birth, the weight at 200 days and the weight at 300 days. The pedigree consisted in 2102 cattle: 154 sires, 948 dams and 1000 cattle with records. The data were from Aberdeen Angus Association beef cattle. The heritability for the birth weight and body weight at 200 and 300 days was 0.288, 0.594, 0.596. The genetic correlations between body weight at 1, 200 and 300 days were positive. The genetic correlation between 200 and 300 days was high 0.486. By improvement of production traits increase the economic efficiency. Trough random regression coefficients, individual variation of genetic and permanent environmental effect in the same animal during growth can be explained. Using random regression model increases the accuracy of the selection by using more performances.

### • Introduction

- The breeding program of Aberdeen Angus breed had the objective to increase the growth traits. To genetic evaluation of these traits, it was necessary to choose the best model which account better the genetic and environmental variance. In Romania the random regression model did not use for growing traits in Aberdeen Angus breed.

### • Material and method

The records were the body weight at 1, 200 and 300 days. The pedigree consisted in 2102 cattle: 154 sires, 948 dams and 1000 cattle with records. The data were from 2021-2022 years. The data were from Aberdeen Angus Association for beef cattle.

The growth traits were analyzed using a random regression test-day model (Jamrozik & Schaeffer, 1997[ 8]):

$$y = X_1 b_1 + X_2 b_2 + Z_1 h + Z_2 a + Z_3 p + e$$

$y$  = body weight for each cow

$X_1$  = the incidence matrix which associated the performances at fixed effected

$X_2$  = the incidence matrix which associated the performances at fixed effect average growth curve

$Z_1$  = the incidence matrix which associated the performances at random effect of contemporary group cow

$Z_2$  = the incidence matrix which associated the performances (breeding values) at random effect of all animals

$Z_3$  = the incidence matrix which associated the performances at random effect (permanent environment effect)

$b_1, b_2, h, a, p$  = the vectors of considered effects

$e$  = residual error

### • Results and discussions

Table 1. The descriptive statistics for growth traits

Traits	Mean ± standard error	Standard deviation	Coefficient of variability (%)
Birth weight (kg)	29.341±0.136	4.30	14.68
Weight at 200 days (kg)	216.341±1.43	45.27	20.92
Weight at 300 days (kg)	274.020±1.634	51.68	18.86

Table 2. The heritability for growth traits

Traits	The heritability
Birth Weight	0.288
Weight at 200 days	0.594
Weight at 300 days	0.596

• Table 3. The genetic correlation between growth traits

	Birth weight	Weight at 200 days	Weight at 300 days
Birth weight	1.00	0.071	0.146
Weight at 200 days	0.071	1.00	0.486
Weight at 300 days	0.146	0.486	1.00

### • Conclusions

The heritability for weight at 200 days and weight at 300 days were high. The correlations between birth weight and weight at 300 days was medium and positive. The random regression model was adequate to estimate the genetic parameters for growth traits in Aberdeen Angus beef cattle breed.

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