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## Estimation the genetic parameters for calving score using an animal model, in Aberdeen Angus breed

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**Abstract:** The objective of this study was to estimate the breeding value and heritability for calving score using an animal model for population from Aberdeen Angus breed. Data consisted of records of 1297 calves of Aberdeen Angus breed from Aberdeen Angus Association Romania. The mean for calving score was  $1.007 \pm 0.002$ . The breeding values for calving score for calves were between -0.013 and 0.075. The heritability for calving score was low 0.08 in Aberdeen Angus breed. The animal model was adequate due it is simpler than threshold model for calculate the genetic parameters for calving score.

### • Introduction

In the breeding program of Aberdeen Angus breed from Aberdeen Angus Association Romania are monitored the traits as reproductive precocity and development of reproductive parameters such as fecundity, fertility, vitality and viability. Calving ease is an important economic trait. The calving difficulty influences the costs by veterinary costs, the reproductive efficiency decreases by the calf losses. For genetic evaluation of cattle for calving ease the linear models are more suitable (Tomka, 2018). The aim of this study was to estimate the breeding values and heritability for calving score in Aberdeen Angus breed using an animal model.

### • Material and method

The data from 1297 Aberdeen Angus calves born in the years 2021 and 2022 were used in this study. The pedigree covered 2905 animals: 1297 calves, 314 bulls and 1294 dams from Aberdeen Angus Association Romania. In our study were two categories of calving: 1-is unassisted calving, 2 - is assistance required. The model used is animal model (Grosu et al., 2013) described as follows:

- The model be written as:

$$y_{ijk} = S_i + H_j + a_k + e_{ijk}$$

- $y_{ijk}$  = is an observed score (a number from 1 to m) on calf k, of sex i, in herd j
- $S_i$  = is a sex of calf effect
- $H_j$  = herd effect
- $a_k$  = is a calf additive genetic effect
- $e$  = is a residual error effect
- The model included the fixed effects: the sex and the herd. The sex has two levels: female and male. The levels of effect herd were 292. The fraction of animals in the first category ( $0.992 = 1287/1297$  (from category one-unassisted calving) and in the second category  $0.007 = 10/1297$ .
- From all calves, 813 calves were females and 484 were males.

### • Results and discussions

Table1. The breeding value of the 10 best Aberdeen Angus calves for calving score

No.	Breeding values for the best calves
1	-0.013
2	-0.013
3	-0.013
4	-0.013
5	-0.012
6	-0.012
7	-0.010
8	-0.008
9	-0.007
10	-0.006

Table 2. The heritability of Aberdeen Angus population for calving score

Trait	$h^2$
Calving score	0.08

### • Conclusions

- The heritability of calving score was low in Aberdeen Angus breed. The animal model was easy to use to estimate genetic parameters for calving score. In the selection of cows, the breeding value is important for choice the best animals. The genetic parameters are important in the breeding program of the Aberdeen Angus breed.

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