UNIVERSITY OF LIFE SCIENCES
"KING MIHAI I" FROM Timisoara

Multidisciplinary Conference on Sustainable Development

30-31 May 2024

ESTIMATION THE GENETIC PARAMETERS FOR AGE AT THE FIRST CALVING AND CALVING INTERVAL IN ROMANIAN SPOTTED, SIMMENTAL

Mircea Cătălin Rotar*[1], Rodica Ștefania Pelmuș*[1], Mihail Alexandru Gras[1], Cristina Van[1]

[1] National Research-Development Institute for Animal Biology and Nutrition, Calea București No. 1, 077015, Balotești, Romania

Abstract

The objective of this study was to estimate the genetic parameters for reproductive traits in Romanian Spotted, Simmental type cattle breed using animal model. The data of reproduction traits were from Romanian Breeding Association Romanian Spotted, Simmental type. The age at the first calving was 889.82±2.79 days and first calving interval was 391.55±2.08. The heritability value for age at the first calving was 0.25 and for calving interval was 0.14. The breeding values of cows with records for age at first calving were between -77.52 and 62.60 and for first calving interval between -31.149 and 44.55. Improvement the reproduction traits increase the profitability of farms.

Introduction

The reproduction traits are very important for profitability of farms. Romanian Spotted, Simmental type has dual-purpose, milk and meat.

In the breeding program of Romanian Spotted, Simmental type the main objectives are the productions traits and reproduction traits.

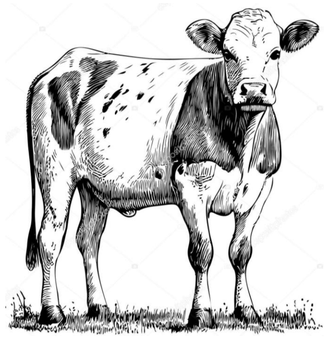
The aim of this study was to estimate the genetic parameters for age at the first calving and the first calving interval for Romanian Breeding Association Romanian Spotted, Simmental type breed with animal model.

• Material and method

The pedigree consisted of 1938 animals:
698 cows,
185 bulls and
1064 cows with performance

$$\begin{pmatrix} X'X & X'Z \\ Z'Z & Z'Z + A^{-1}K \end{pmatrix} \begin{pmatrix} \tilde{b} \\ \hat{a} \end{pmatrix} = \begin{pmatrix} X'Y \\ Z'Y \end{pmatrix}$$

$$h^2 = \frac{\sigma_a^2}{\sigma_a^2 + \sigma_e^2}$$



Where σ^2_a= the additive genetic variance, σ^2_e= residual variance. The relative breeding value is: BV% = relative breeding value, BV_{abs}= absolute breeding value, σ_{BVabs}= standard deviation of absolute breeding values

$$BV\% = 100 + 12 * \left(\frac{BV_{abs} - Average\ BV_{abs}}{\sigma_{BVabs}} \right)$$

• Results and discussions

Table 1. The age at first calving and first calving interval in Romanian Spotted, Simmental type breed

Trait	Mean and standard error
Age at first calving	889.82±2.79
First calving interval	391.55±2.08

Table 3. The heritability for age at first calving and first calving interval for Romanian Spotted, Simmental type breed

Trait	Heritability
Age at first calving	0.25
First calving interval	0.14

Table 2. The variances for age at first calving and calving interval

Trait	Additive variance (V_a)	Residual variance (V_e)	Phenotypic variance (V_f)
Age at first calving	2072.5	6209.4	8281.9
First calving interval	662.17	3972.23	4634.41

Table 4. The absolute and relative breeding value for the best cows for age at first calving

Number	EBV	R-EBV
1	-77.523	136.819
2	-71.327	133.767
3	-70.315	133.268
4	-70.175	133.200
5	-69.605	132.919
6	-68.896	132.569
7	-68.529	132.389
8	-67.917	132.087
9	-67.107	131.688
10	-66.795	131.534

Table 5. The absolute and relative breeding value for the best cows for first calving interval

Number	EBV	R-EBV
1	-31.149	135.297
2	-20.193	122.267
3	-18.167	119.858
4	-17.936	119.577
5	-17.734	119.343
6	-17.694	119.295
7	-17.581	119.161
8	-16.954	118.415
9	-16.402	117.759
10	-16.175	117.489

Conclusions

The heritability for age at first calving and first calving interval were low in Romanian Spotted, Simmental type breed. For improvement the reproduction traits it is necessary the selection of the best cows and a good management of farms.

Acknowledgement: This work was supported by funds from the National Research Projects 8.1.2 granted by the Romanian Ministry of Agriculture and Rural Development and the Perform project 8 PFE/2021, funds from Ministry of Research, Innovation and Digitalization and Romanian Breeding Association Romanian Spotted, Simmental type.