

ESTIMATION OF GENETIC PARAMETERS AND BREEDING VALUE FOR GROWTH RATE ON ESTONIAN RED BULLS

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SUMMARY

Contemporary Comparison and Best Linear Unbiased Predictor (BLUP) methods were used to evaluate 620 performance-tested Estonian Red young bulls for daily gain at the central testing station. The phenotypic standard deviation was 96 g per day and the heritability was estimated to be 0.43. In order to evaluate bulls across the years, the model took into account genetic trends due to sires and dams. The annual genetic trend among Estonian Red bulls tested was estimated to be 2.4 ± 0.4 g per day.

INTRODUCTION

Selection program for Estonian cattle breeds are designed as a two step procedure. Performance testing of the bulls from birth to 12 months takes place to allow estimation of the breeding value of growth rate. Those selected in the first step are subsequently progeny tested for milk traits. In this paper we aim to outline the estimation of breeding value of growth rate of Estonian Red bulls by Contemporary Comparison Method and Mixed Model procedure.

MATERIALS AND METHODS

Records on growth rate of young bulls at the test station of Estonian Red Cattle were analyzed by Contemporary Comparison Method and BLUP (by Henningsson, 1985). There were 620 bulls born between 1980 and 1992. To estimate genetic parameters and genetic progress in daily gain, the Mixed Model was used. The model contained the effects of year-season, genetic group of sires and dams, sire within group and individual bull within sire. Each year was split up into two seasons: December-May and June-november.

RESULTS

An average phenotypic variance of daily gain was found to be 6200 (g/day)^2 for the test period of 60-365 of age. The variance ratio was 20.4. Estimates of sire and dam group differences show that Estonian Red sires and dams have improved in genetic level. Average breeding value of different year batches of bulls, their average phenotypic value, expressed as deviations from year 1980 showed positive trends. The linear regression coefficients of average breeding value and phenotypic value on years were 2.4 ± 0.4 g/day and 10.2 ± 4.3 g/day, respectively.

DISCUSSION

Estimates of breeding values for daily gain were calculated using the average growth rate of contemporary groups to adjust for seasonal influences on daily gain (Henningsson, 1985). Anyway, the contemporary groups did not adjust satisfactorily for seasonal effects, due to small number of bulls and sires tested within a period. The genetic level of the contemporary groups fluctuate, which affect the estimates of breeding values of the young bulls. A Mixed Model procedure provides estimates that can be used to make comparisons across years and generations.

REFERENCES

HENNINGSSON, T. (1985) Performance Testing for Beef Production Traits in Swedish Dual Purpose and Beef Cattle. Report 64.