Accepted Manuscript

Genetic analysis of age at first calving, accumulated productivity, stayability and mature weight of Nellore females

P.I. Schmidt, G.S. Campos, R.B. Lôbo, F.R.P. Souza, C.C. Brauner, A.A. Boligon

PII: S0093-691X(17)30576-9

DOI: 10.1016/j.theriogenology.2017.11.035

Reference: THE 14367

To appear in: *Theriogenology*

Received Date: 2 July 2017

Revised Date: 24 November 2017

Accepted Date: 26 November 2017

Please cite this article as: Schmidt PI, Campos GS, Lôbo RB, Souza FRP, Brauner CC, Boligon AA, Genetic analysis of age at first calving, accumulated productivity, stayability and mature weight of Nellore females, *Theriogenology* (2017), doi: 10.1016/j.theriogenology.2017.11.035.

REVISED

Genetic analysis of age at first calving, accumulated productivity, stayability and mature weight of Nellore females

P. I. Schmidt[a], G. S. Campos[a], R. B. Lôbo[b], F. R. P. Souza[c], C. C. Brauner[a], A. A. Boligon[a,#,*]

[a]Animal Science Department, Federal University of Pelotas, 96010-900 Pelotas, Brazil
[b]National Association of Breeders and Researchers, 14020-230, Ribeirão Preto, Brazil
[c] Ecology, Zoology and Genetics Department, Federal University of Pelotas, 96010-900, Pelotas, Brazil
[#]National Council of Technological and Scientific Development (CNPq), 71605-001, Brasília, Brazil
*Corresponding author: arioneboligon@yahoo.com.br

Abstract: The female reproductive performance, productivity and size are strongly associated with production efficiency of herds raised in a tropical environment. The age at first calving (AFC), accumulated productivity (AP), stayability (STAY) and mature weight (MW) could be used as indicators of these traits. In this study, the genetic parameters and correlations between AFC, AP, STAY and MW measured in Nellore females were estimated, in order to provide support for the beef cattle evaluation programs. In addition, the genetic changes for these traits were obtained. The (co)variance components were estimated by Gibbs sampling by four-trait multivariate analysis, using a threshold animal model for STAY and linear animal model for the other traits (AFC, AP and MW). Heritability of AFC, AP and STAY showed low values, with posterior means of 0.13±0.02, 0.14±0.01 and 0.19±0.03, respectively. On the other hand, for MW were estimated mean heritability of 0.44±0.03 and repeatability of 0.77±0.03, demonstrating the importance of genetic and permanent environmental effects for the expression of beef cows' size. The AFC showed null genetic correlation with AP (-0.06±0.12) and MW (0.01±0.09) and low and negative with STAY (-0.15±0.11). The AP showed high genetic correlation with STAY (0.86±0.03) and weak with MW (0.23±0.09). Positive and moderate genetic association was estimated between STAY and MW (0.66±0.05). Annual direct genetic trends of 0.19 kg, 0.30 units and 0.10 kg were estimated for AP, STAY and MW, respectively, and were significant (P<0.05) for STAY and MW. For AFC, negative and favorable annual genetic