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Factors Influencing the Occurrence of Abnormal Lactation Curves in Iranian Buffaloes

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Abstract

Rearing practices of buffaloes in Iran are under the rural system and in open areas. The total milk yield in 240, 270, or 305 days bases is often being used in genetic evaluation of buffaloes. High peak yields in normal lactation curves are correlated with high total milk yield. An ideal lactation curve has a high peak yield with moderate persistency. However, some curves do not have distinguished peak. Furthermore, another proportion of the curves are concave in shape. These curves, mostly characterised by the absence of the lactation peak, are called atypical lactation curves (ALCs), and are the subject of the present study. Logistic regression was used to assess the influences of some non-genetic factors on the occurrence of ALCs in Iranian buffaloes. The data set consisted of 24679 lactation records from 11478 buffaloes that calved during the years 1996 to 2012. As a reasonable statistical criterion, odds and odds ratio were used to evaluate the probable differences between the various levels of the factors. Genetic analysis of the ALC trait was also carried out using Bayesian approach to estimate heritability and repeatability parameters. The results revealed that almost 44 percent of the lactation curves were atypical. All factors, but ecotype factor had significant effects on the occurrence of ALCs. The frequency of ALCs increased until the 3rd parity and decreased afterward, therefore the highest and the lowest values of the trait were observed in the 3rd and 10th parities, respectively. Unlike the parity effect, ageing of the buffaloes caused the odds values to be continually increasing. The incidence of the ALCs for buffaloes calved out of season (July to December) was more likely (almost 15%) than those calved in season (January to June). The structure of the data also affected the trait significantly ($p < 0.05$), such that the lactations with 4 recorded test-days were 1.75 times more likely to have atypical curves than those with 8 recorded test-days. Heritability and repeatability of the occurrence of ALCs were estimated very low and were 0.020 and 0.036, respectively.

Keywords: Atypical lactation curves, Iranian buffaloes, logistic regression, threshold trait