

Prolactin use as Stress Indicator in Purebred and Crossbred Cattle in a Yucatán Farm (Mexico)

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The aim of this study was to evaluate the adaptability to the tropical climate of purebred and crossbred cattle reared in a ranch near Tizimín, Yucatán, Mexico, through the prolactin (PRL) serum levels comparison. The PRL has a well-documented role in milk production, and plays a role in stress correction, immune system and thermo-regulation. The trial involved 11 calves: six females and five males, three Brahman (B), three Chianina reared in America (CNA), three crossbred Chianina Italiana (CNI)xCNA and two crossbred Marchigiana (MRI)xCNA. Serum blood samples were collected twice a day at 6.00 am and at 1.00 pm, in the four Yucatán typical seasons: February (dry season start), May (dry season end), September (rainy season height), November (between rainy and dry season). In total, 22 samples for four seasons were collected. The hour collection choice was determined by relevant ambient temperature (AT) and relative humidity (RH) difference at 6.00 am (AT 21.9 °C; RH 81.5 %) and at 1.00 pm (AT 33.5 °C; 45.1 %). In February, at the trial start, the average age of these animals was 87.0 days, and at the end (November) 348 days. The PRL serum was determined in Italy by radioimmunoassay in the DIMEVET laboratory in Bologna. The data were analysed by a one-way general linear model considering, as factors, sex, breed, month, and collection hour, and their interactions. Differences between means were tested with the Tukey test. Correlation between PRL, AT, RH and age were calculated. A PRL level significant difference between sexes ($P < 0.0001$), breeds ($P < 0.017$) and months ($P < 0.002$) was found, but not between collection hours. Interactions sex x breed ($P < 0.022$), sex x month ($P < 0.009$) and breed x month ($P < 0.028$) resulted significant. As expected, females showed a double PRL level than males (54.2 ng/ml vs 20.5 ng/ml). Concerning breeds, CNA showed the highest PRL level (58.1 ng/ml) and MRI x CNA the lowest (16.7 ng/ml). The highest PRL level was found in May (99.2 ng/ml) and the lowest in November (20.2 ng/ml). No significant correlations between PRL and the other parameters (AT, RH and age) were found. In conclusion, the highly stressing conditions of May, at the dry season end, determined a significant PRL increase in both sexes. No clear genotype influence was found in this trial, probably due to the low subject number. Higher serum PRL in cattle suggests its use as a stress indicator in tropical climate.