

II behavioral type - equally expressed food and defence responses; III behavioral type - timid, with predominance of the defence response. Holstein cows from I (n=3) and III (n=3) behavioral types at I lactation were transported to the Missouri climatic laboratory (20 miles) and exposed to heat (35 C) for 7 hours (from 9.30 to 16.30). Blood and milk cortisol, epinephrine, norepinephrine, growth hormone and prolactin were measured before transportation (7.30 h) and during exposure to heat (9.30 h, 12.30 h, 13.30 h, 15.30 h and 16.30 h). Physical and emotional responses raised by the transport and the novelty in the climatic laboratory resulted in a significant elevation in plasma and milk cortisol levels immediately after placement of the cows in the climatic laboratory (9.30 h). The third type of cows tended to have higher cortisol level. Heat exposure caused a significant decline in plasma and milk cortisol levels. The enumerated environmental stressors resulted in plasma norepinephrine elevation in III type of cows. In contrast norepinephrine in I type of cows remained unchanged. Plasma norepinephrine level in III type of cows declined significantly under heat but tended to be higher compared to that in I type of cows. Milk norepinephrine levels during heat exposure were under sensitivity of the method. Basal plasma epinephrine levels were higher ($P < 0.05$) in III type of cows. Plasma epinephrine levels under heat were under sensitivity of the method. The emotional arousal caused a significant rise ($P < 0.01$) in plasma prolactin levels, which remained high under heat in both behavioral types of cows, but prolactin levels tended to be higher in III type of cows. Milk prolactin levels, in both types of cows, were not influenced by the stressors. Plasma and milk growth hormone levels were not significantly influenced by the stressor treatment. The presented results suggest that the specific response to heat stimuli has overwhelmed non-specific "psychological" response in order to reduce the level of calorogenic hormones and to counteract heat-induced inhibition of the immune response. Besides, these results show that plasma cortisol, epinephrine and norepinephrine are related to the behavioral type.

Key words: behavioral type, plasma and milk cortisol, epinephrine and norepinephrine

P-35 Insulin-like growth factor binding proteins (IGFBPs) in camels: Revelation by Western ligand blotting and partial purification of insulin-like growth factor binding protein-3 (IGFBP-3)

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It's well known that Insulin-like growth factor binding proteins (IGFBPs) are important in somatotrope axis in mammals. They modulate bioactivity of Insulin-like growth factor-I/II. In this study, we identified IGFBPs in blood of camel by Western ligand blotting and we investigated a procedure to purify IGFBP-3 from this species. Three distinct bands are observed. By analogy to that known in mammals, they are identified as insulin-like growth factor binding proteins-3 (IGFBP-3: 40-46 kDa), insulin-like growth factor binding proteins-2 (IGFBP-2: 32 kDa) and insulin-like growth factor binding proteins-1 (IGFBP-1: 28 kDa). IGFBP-3 precipitates in 40-60% by ammonium sulfate saturation of serum. Acidification of 40-60% fraction at pH 3.0 is necessary to dissociate IGFBP-3 from tertiary complex (IGFBP-3, acid labile subunit and IGF-I/II). IGFBP-3 is partially purified by anionic ions exchange chromatography at pH 8.5. It forms a clear doublet band.

Key words: IGFBPs, camel, purification, IGFBP-3

P-36 Circannual productive and reproductive characteristics and testosterone levels in rams of tropical hair sheep breeds in Mexico

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Growth and reproductive development were monitored during approximately one year in nine yearling rams (12 months of age) and nine 6-month old ramlambs of the Saint Croix (SC), Blackbelly (BB) and Pelibuey (PB) breeds, three ramlambs for each breed and age, under confinement. The study was conducted at Ganadera Mirasol, Güémez, Tamps., located at 24° 03' LN and 98° 59' LO, the climate is ACw, semicalid, subhumid, with mean annual temperature and rainfall of 23.8 °C and 800