I-INTERNATIONAL MEETING OF ANIMAL SCIENCE IN SEMI-ARID REGIONS
Universidade Federal do Agreste de Pernambuco – UFAPE
July 03rd to 05th, 2024, Garanhuns-PE

Área do trabalho: Nutrição e Produção de Não-Ruminantes

Correlations between milk production and body development of donkey foals of the Nordestino ecotype

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Multivariate analysis is the statistical approach used to analyze data sets involving multiple variables simultaneously. When applied to quantitative variables, this technique becomes quite useful for understanding the interrelationships between different components. The study aimed to analyze the interrelationships between milk production and weight gain and body development of Nordestino ecotype donkey foals. For this purpose, 14 Nordestino ecotype donkey mares and their respective foals were used, with the mares being between 3 and 7 years old and having a mean body weight of 185 ± 30 kg. A completely randomized experimental design with repeated measures over time was used. The animals were divided into five groups based on their mean milk production, which consisted of 3.75, 4.58, 4.94, 5.43, and 7.16 kg per day. The mares remained in native pasture area throughout the gestation period, with water and mineral salt available *ad libitum*. At 11 months of gestation, the mares were transferred to maternity paddocks and, after giving birth, remained in an area of approximately 0.5 hectares without vegetation cover. From the 11th month of gestation, the daily dry matter intake was 2.5% of the body weight, consisting of 70% forage and 30% commercial concentrate specific for breeding equids. The forage consumed exclusively was Tifton 85 hay (*Cynodon* spp.). Daily milk production was determined by weighing the foals before and after suckling at 20, 40, 60, 80, 100, 120, 140, 160, and 180 days after birth. Daily milk production was determined by summing the amount of milk consumed by the foal over 24 hours, divided into 12 periods with two-hour intervals. In each of the 12 periods, the foals remained with their mothers but were prevented from suckling by using a leather pouch, which was removed at the end of each period for 15 minutes to allow suckling. To monitor the foals' development, the day following the weighing to determine milk production, body weight, chest circumference, withers height, and body length were measured. At the end of the study, the data were subjected to principal component analysis. As expected, higher milk production resulted in greater weight gain and body measurements in the foals. Additionally, it was observed that in the groups of mares with a mean milk production of 4.58 and 4.94 kg of milk, the foals showed a more significant gain in body length. In the two groups with the highest milk production (5.43 and 7.16 $kg.day^{-1}$), the foals' body gains were more evenly distributed between weight and the three linear measurements. It was concluded that in Nordestino ecotype donkeys, lower milk production in the first six months of lactation can result in more significant body length gain in foals, while higher milk production promotes more uniform gains in height, length, and depth of the foals.

Keywords: Body growth, Donkeys, Linear measurements.

Acknowledgements: Capes, UFAPE, GEQUAM.