Non-genetic factors affecting calving interval and weaning weight in a buffalo herd located in flooded savannas, Cojedes state, Venezuela

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ABSTRACT: The objective of the research work was to characterize a buffalo herd in flooded conditions in Cojedes state, Venezuela, being evaluated the calving distribution (CD), calving interval (CI) and weaning weight (WW). Birth and productive records from Hato La Soledad were used to determine monthly frequencies of calving (n=2106), calving interval (n=936) and weaning weight (n=1683). The statistical analysis included year (CY) and calving season (CS), sex of calf (SC), age of cow (AC) and interactions for CI, including additionally age to weaning for WW. Results showed significant differences (P≤0.05) in CD between years associated with year-on-year changes in climatic factors and progressive stabilization of the herd. CI averaged 473.9±3.0 days (X±S.E.), with a significant effect of calving month (P≤0.05). CI in the herd showed an elevated percentage (75.6%) of buffalo cows with CI lower than 400 days. The effect of age at calving was not significant doubt to the fact that the herd was young. WW averaged 130.4±1.9 kg with age to weaning of 238.7±3.2 days, with significant effect of year and calving month, and age to weaning, with a daily gain of 128 g. The results showed the productive and reproductive potential of the buffalo in tropical conditions.

INTRODUCTION - The buffalo breeding in Venezuela could potentially use 2.5 million of hectares of flooded areas, with forages of low quality, limiting the development of cattle. This fact and the increment of buffalo population directed to milk and meat production has highlighted the need to evaluate the factors affecting the performance of the herds, in order to improve the productive efficiency in these conditions. In Venezuela, research works in buffaloes are limited, being necessary to produce local information related with husbandry and production, in order to increase the knowledge about this species in our country. In this sense, an evaluation was done with the objective of generating basic information about productive and reproductive characteristics like as calving distribution, calving interval and weaning weight, in flooded conditions.

MATERIAL AND METHODS - Information from a commercial herd was used, located
in Hato La Soledad, Cojedes state, Venezuela, in conditions of flooded savannas. The herd had about 1000 cows, in 2700 ha, with an annual precipitation of 1583 mm, temperature of 26.1 °C and 76.4% in relative humidity. Birth and production records (n=2106) between 1997 and 2002 were used. The evaluated characteristics were calving distribution (CD), calving interval (CI) and weaning weight (WW).

Data were analyzed using least square methodology (Harvey, 1966), including calving year (CY), calving season (CS), sex of the calf (SC), age of cow (AC) as sources of variation for CI and WW. Additionally, age at weaning (AW) was included in WW analysis. Initially was used a complete model in the analysis of variance, eliminating non significant interactions (P>0.05) to obtain a reduced model. CD was evaluated using Chi square test to determine inter-annual homogeneity in distribution pattern.

**RESULTS AND CONCLUSIONS** - Results obtained in CD suggest a seasonal pattern in calving, concentrating them between July and November (73.2 %), and the highest value in September (Figure 1). This distribution agrees with the results obtained by Colmenares (1997) and Scannone (1997). Some variations were observed between 2000 and 2001, due to management problems associated with nutrition.

**Figure 1.** Calving distribution in a buffalo herd in conditions of flooded savannas.

CI showed a non-adjusted average (X±S.E.) of 473.9 ± 3.0 days, with a coefficient of variation of 16.3 % and adjusted average of 485.1 ± 3.9 days, similar to the values reported by Batista et al. (1981) and higher than Colmenares (1997) and Montiel (1999). It is important to highlight the significance of the effect of calving year (CY) and season (CS) and their interaction, with the highest difference (55.5 days) between 1999 and 2001, associated with husbandry, changes in the herd and culling of animals with reproductive problems. Besides, CS had a significant effect on CI, with lowest values in rainy season, as also reported by Mourad et al. (1989) and Bello (2003).

In WW was obtained an adjusted average of 243.5 ± 1.1 kg (X±S.E.), with a coefficient of variation of 13.5 %, with an age to weaning of 249.5 ± 0.7 days, values higher than reported by Ahmed and El-Shazly (1975) and Bello (2003). CY showed a highly significant effect, with a maximum difference between 2001 (higher) and 2000 (lower) of 27 kg (12 %). Changes through the years were associated with problems in the management of the herd, as also reported by Aman et al. (1984) and Bello (2003).

The effect of sex of calf was significant, with a difference of 12.8 kg (5.4 %) favouring to male calves, as obtained by Ramírez et al. (2001). The linear regression of age to weaning had a significant effect, indicating a daily gain of 0.815 kg/day, higher than reported value by Bello (2003) in similar conditions.
In general, our results are similar to those reported by other authors in similar conditions, indicating a strong seasonality in buffalo herds. Calving interval reflects reproductive or management problems, related with decisions in culling of unproductive animals. Additionally, the high value of WW is indicative of ability to use the resources available in flooded areas, thus confirming the potentiality of the species in these conditions.

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