

# Non-genetic factors affecting calving interval and weaning weight in a buffalo herd located in well drained savannas, Guárico state, Venezuela

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**ABSTRACT:** The main focus of this research was to evaluate non-genetic factors affecting calving interval (CI) and weaning weight (WW) on a buffalo herd located in well drained savannas of Guárico state, Venezuela. The study involved records (1997-2001) related to monthly frequency of calving (n=486); calving interval (n=365) and weaning weight (n=376). Data analysis included year and calving season, calf sex, cow age and the interactions for CI. For WW, age at weaning was also included in the statistical analysis. Results revealed significant differences for calving distribution per year ( $P \leq 0.05$ ) associated with year-on-year climatic factor changes and progressive herd stabilization. CI averaged  $378 \pm 1.8$  ( $\bar{X} \pm S.E.$ ) days, with a coefficient of variation (CV) of 7.3% and a significant effect of calving month ( $P \leq 0.05$ ). CI frequency distribution for herd showed 75% cows lower than 400 days. Female age at calving was not significant (linear or quadratic) due it was a young herd, with less than 2.6% animals older than 11 years. WW averaged  $130.4 \pm 1.9$  kg and CV of 24.4%; age to weaning  $238.7 \pm 3.2$  days, with calving month and age to weaning showing significant effect, while the weight average daily gain was 128g per animal. These findings suggest buffalo's productive and reproductive potential under tropical conditions.

**Key words:** Calving interval, Weaning weight, Venezuela.

**INTRODUCTION** - Distribution of calving is an important indicator of reproductive seasonality, marking a mating season during the year (Colmenares, 1992). In Venezuela, the months with higher calvings are from July to December (Piedrahita, 1994; Colmenares, 1997; Tiape, 1999). It is important to study the calving seasonality in order to elaborate management plans during the year, concentrating activities in the rearing herd at the time with higher values of calving.

Additionally, calving interval is another reproductive characteristic with a valuable economic importance, being related with number of calves by lifetime. Diverse authors indicate averages in calving interval between 365 and 513 days (Ríos y Reggeti, 1990; Montiel, 1999).

In relation to productive aspects, weaning weight (WW) is a variable associated with growth of the calf and maternal ability of the cow, scarcely evaluated in Venezuela. The observed range of averages in WW is from 64.4 to 224.1 kg, depending of the age to weaning (Polikronov *et al.*, 1979; Ahmad *et al.*, 2002). Diverse non genetic factors can affect WW in buffaloes (e.g. calving year and month, sex of the calf, age of the cow, between others).

**MATERIAL AND METHODS** - The research work was done in Hato Barrancas, a farm located in Las Mercedes del Llano municipality, Guárico state, Venezuela, in well drained savanna conditions.

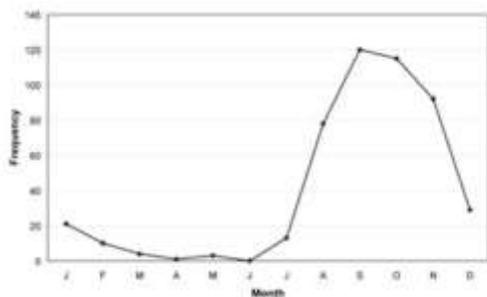
Precipitation is seasonal, with an annual average of 1.220 mm, with erratic and intense rains, from June to October. Temperature has an annual average of 26.3 °C, with a maximum of 32.5 °C and a minimum of 21.6 °C. Humidity has an annual average of 74 %. Soils are acid and well drained.

Records of births from 1997 to 2001 were used to establish the distribution of calving (n=486), calving interval (n=365) and weaning weight (n=376). In the case of distribution of calving was used the Chi square test to evaluate its homogeneity through the evaluated years.

Records of calving interval (CI) and weaning weight (WW) were analyzed using additive linear models by Least-squares (Harvey, 1966). The model included calving year and season, sex of the calf and age of the cow (linear and quadratic). For WW, age at weaning was also included in the statistical analysis. The test of Duncan was used to compare averages.

**RESULTS AND CONCLUSIONS** - The distribution of calving in the studied herd is shown in Figure 1. As it is shown, births were concentrated (83.3 %) during four months (August to November). The Chi square test found differences in the distribution of calving trough the evaluated years, due to inter annual changes in climatic aspects and stabilization of the herd.

Figure 1. Distribution of births trough the year in the evaluated herd.



The average of calving interval was  $372.8 \pm 1.8$  days ( $\bar{X} \pm S.E.$ ) and a C.V. of 7.3 %. The month of calving affected the calving interval ( $P < 0.05$ ) with higher values in buffalo cows with calving at the finish of calving season (December).

It was observed a high proportion of animals with calving interval lower than 400 days (75.6 %), similar to the results obtained by Colmenares (1997) with 76.7 %. The age of the buffalo cow did not affect the calving interval possibly because the herd was constituted by young animals.

The average of weaning weight was  $130.4 \pm 1.9$  kg ( $\bar{X} \pm S.E.$ ) and a C.V. of 24.4 %, with an average age at weaning of  $288.7 \pm 3.2$  days. Significant effects of calving year, calving month and age at weaning were found. It was found a very low daily gain of 329 g, indicating nutritional problems in the farm.

Results highlight the productive potential of this species in conditions of well drained savannas, particularly in terms of reproductive performances.

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