# GENETIC ASPECTS OF PRODUCTIVE AND REPRODUCTIVE TRAITS IN A MURRAH BUFFALOES HERD IN SÃO PAULO, BRAZIL

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## SUMMARY

There were studied the genetic trends of some productive and reproductive traits in a herd of Murrah Buffaloes raised in São Paulo, Brazil. Breeding value was estimated by the maximum likelihood method, using an animal model and some fixed effects. Estimated heritability values were 0.25; 0.01; 0.10 and 0.40 for milk production, lactation length, calving interval an age at first calving, respectively. Mean predicted breeding values for cows, dams and sires for each calving year were presented.

Keywords: Heritability, repeatability, breeding value, buffaloes.

## INTRODUCTION

According to HILL, (1972 a,b) for a best evaluation of genetic change in a herd it should be done selection experiments in a constant environment, divergent selection, replication of the same genetic material in successive generations and analysis of field records.

Because of the high keeping costs of farm animals with low reproductive rate and long generation interval, as occur with the buffaloes, genetic trends are generally studied on the basis of field data or in simulation studies.

Some experimental results (TIWANA & DHILLON 1985; ACHARYA 1991 and RAMOS 1994) show that selection is effective in obtaining genetic gains on economic traits. The present work aimed to estimate the genetic trends of some productive and reproductive traits using field data from a herd of Murrah buffaloes reared in Brazil.

## MATERIAL AND METHODS

There were used 1020, 1086, 1437 and 545 records of milk production (MP), lactation length (LL), calving interval (CI) an age at first calving (AFC), respectively. Data were obtained from a farm near the city of Sarapuí, S.P. (23°39'South, 47°49'West, local climate was classified as Cwa according to Köeppen's classification).

The a nimals maintained on *Brachiaria decumbens*,(Stapf) and *Panicum maximum*, (Jacq, cv.Tanzania) pastures, receiving mineral supplement. During the dry season (April, Through September) they were also fed with sugar cane, cereals plus urea and silage. They were milked twice a day.

Breeding values of sires and dams were estimated by restricted maximum likelihood method, by means of MTDFREML computer program (BOLDMAN *et al.*, 1993), with models that included the fixed effects of the year-season, order of calving and the random effects of individuals,

permanent environment, and error. Inbreeding effects were considered as a covariate. Permanent environmental effect were not considered for the age a first calving.
Estimates of heritability an repeatability for these data sets were used for prediction of breeding values. Mean breeding value of cows, sires and grand dams were calculated for each calving year. Cow's mean breeding value was also calculated for each cow's birth year.

**RESULTS AND DISCUSSION**

Heritability estimates were 0.25; 0.01; 0.10 and 0.40 for MP, LL, CI and AFC, respectively. Repeatability coefficients for MP, LL and CI were 0.42; 0.63 and 0.67.
Heritability values for the four traits were moderated comparing to those obtained by MARQUES(1991). The same happened with repeatability value of MP. On the other hand, repeatability values obtained for LL and CI were too high, when compared to those found in literature. These would be explained by the strict breeding practices used in farm, reducing individual differences with respective to the traits under study.
Mean breeding value of cows, sires and dams, calculated for each calving year are presented in figures 1, 2 and 3.

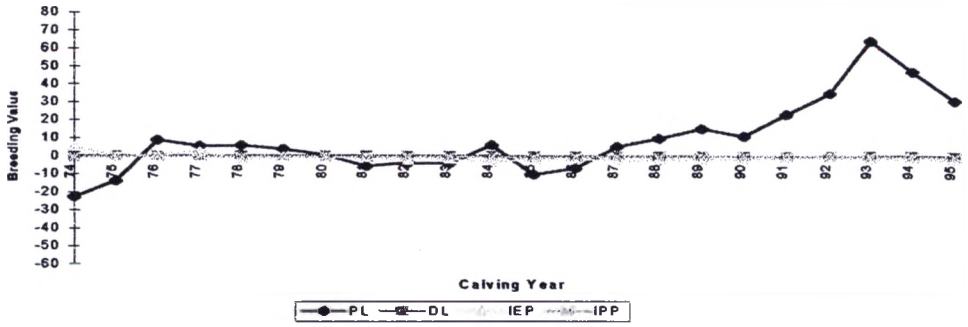


**Figure 1.** Breeding value of cows according to the calving year.

It could be observed in figures 1 and 2 that MP breeding value estimated for the years 1974 to 1995 increased constantly, indicating that an effective selection, based on productive performance, had been carriend out. Animals with very poor performance were possibly culled off at the end of the first lactation. Little variation was observed for LL, CI and AFC, during the same period. This might be due to the small genetic variability among individuals with respcetive to these traits. It also suggests that the means of these traits in this herd are close to the ideal values.

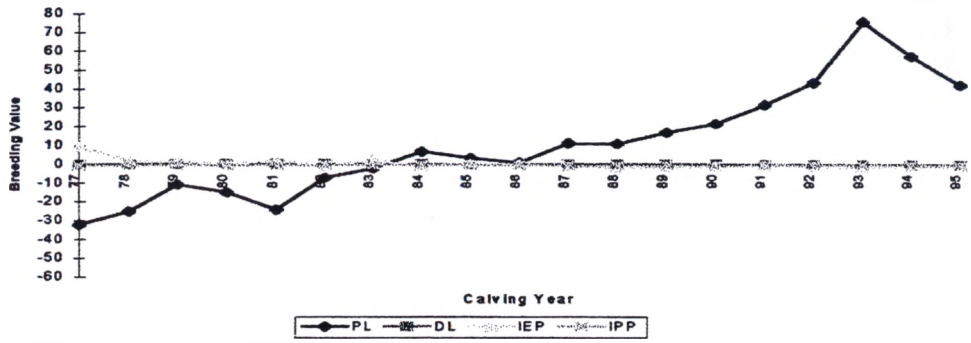


**Figure 2.** Breeding Value of the grand-dams according of the calving year.

Breeding values of sires showed little variation (Figure 3) and are close to the overall mean. How ever , a negative trend was observed over all years. This strongly suggests that there were some difficulties on sire selection for MP and that more wide-range tests for genetic evaluation of sires are needed. As already happened, little variation was observed LL, CI in the traits and AFC from 1978 on wards witch, what could be due to the same reasons presented before.

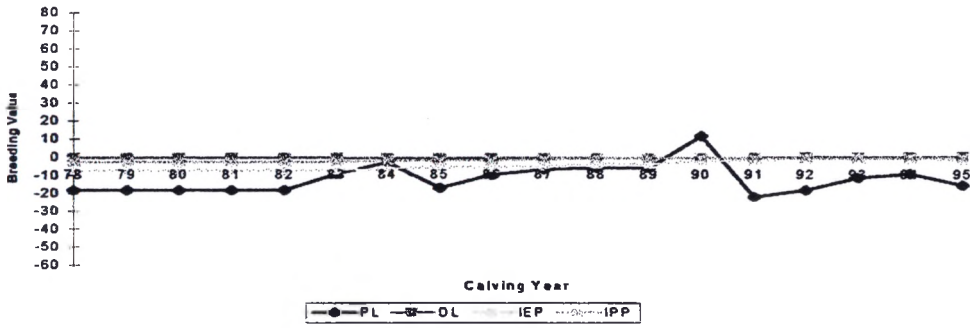


**Figure 3.** Breeding value of sire by progeny's calving year.

The overall means of MP, LL, CI and AFC were: 1496.20 ± 605.72 kg; 271.02 ± 37.32 days, 385.00± 53.45 days and 39.05 ± 6.50 months, respectively. The means of contemporary groups are shown in the Figures 4, 5, 6 and 7, respectively.

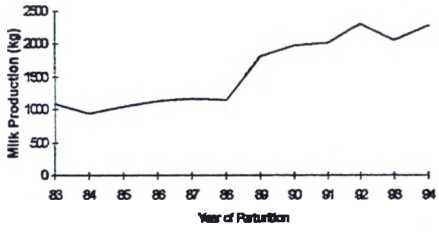


**Figure 4.** Estimated means of milk production according to the year of parturition.

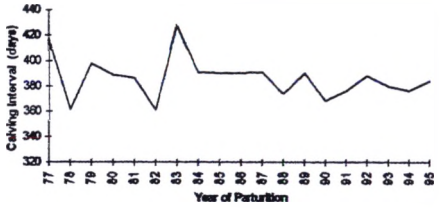


**Figure 6.** Estimated means of calving interval according to the year of parturition.

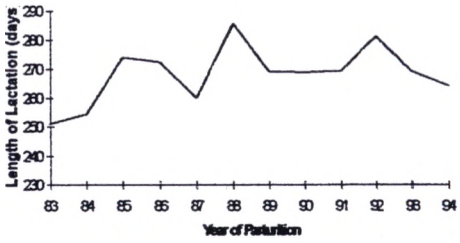


**Figure 5.** Estimated means of lactation length according to the year of parturition.

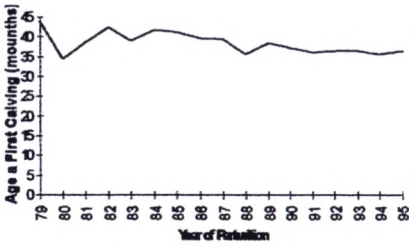


**Figure 7.** Estimated means for the age at first calving according to the year of parturition.

Milk production presented high increase after 1988, probably because during that year the farmers reduced the number of cows in their herds, keeping only the best ones for milk production.

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