Effects of the season and number of calving on buffaloes milk production

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ABSTRACT: The objective of this study was to evaluate the effects of the season and number of calving on average milk production and persistence of lactation. Fifty hundred and ninety one lactation of buffaloes, milked once a day and bred on pasture conditions were analyzed. The animals were allocated according season (off breeding season = Goff and breeding season = Gon) and number of calving (first = FC, second = SC and more than two calving = MC). Data was analyzed by ANOVA. Average milk production was higher on Gon than Goff, and the persistence of lactation was short on Gon than Goff. FC showed lower average milk production than SC and MC that did not differing about. The persistence of lactation was similar among FC, SC and MC. The results showed that on pasture condition, calving on off breeding season results in lower average milk production but in higher persistence of lactation. It is possible that, buffaloes during the off breeding season had higher disposability of pasture that guarantee higher persistence of lactation and buffaloes on breeding season calved with better corporal condition that guarantee higher average milk production. The lower average milk production of first calving buffaloes was according to the expected.

Key words: Breeding season, Milk production, Persistence of lactation, Buffaloes.

INTRODUCTION - Buffaloes bred in places away from the equatorial region present a reproductive behavior which is positively influenced by the decrease in light hours during the day (Zicarelli, 1990). This species may be considered to be seasonal polyestrus in short daylight periods, such as goats and sheep. Due to this characteristic, animals bred in south central Brazil present the majority of estrus manifestations during the autumn. These data were confirmed by Baruselli (1993) and confirmed results of trials performed abroad (Rao et al., 1973; Obi-Reddy et al., 1987).

The breeding season causes a considerable impairing in dairy buffaloes management, due to the concentration of milk production in determined parts of the year. Then, it was developed alternatives to the calving distribution throughout the year. According Barile et al. (1999), due to the increasing economic relevance of the dairy buffalo industry, interest is great both in improving the production level of animal and in shifting the mating industry in order to have milk production before spring, a period in which the mozzarella market demand is very high in Italy. In this country, many farmers with management techniques could distribute the calving along the year (Zicarelli, 1997). In Brazil, since 2001 very good results were obtained by some
protocols developed in order to avoid the effect of seasonality (Baruselli et al., 2002), allowing the appliance of fixed time artificial insemination (FTAI) even during the off breeding season (spring and summer). A significant benefit of using this techniques is that buffalo milk production can be homogeneous distributed throughout the year, without concentrating the calving and the production in determined periods of the year. However, the impact in shifting the mating season to spring and summer on milk production is unknown. Thus, the objective of this study was to evaluate the effects of the season (off breeding season: spring and summer; breeding season: autumn and winter) and number of calving (first calving, second calving and more than two calving) on the average milk production and persistence of lactation.

**MATERIAL AND METHODS** - Five hundred and ninety one lactation (from January of 1998 to November of 2006) of buffaloes, milked once a day and bred on pasture conditions with mineral and water ad libitum were analyzed. These animals, managed in a Vale do Ribeira farm – São Paulo state, were grouped according calving period (off breeding season = Goff and breeding season = Gon) and number of calving (first calving = FC, second calving = SC and more than two calving = MC). The data was analyzed by one way ANOVA and the minimum significance level considered was 5%.

**RESULTS AND CONCLUSIONS** - The year of lactation did not interfere on the results. Average milk production was higher in Gon than in Goff (P<0.05), but the persistence of lactation was shorter in Gon than in Goff (P<0.05; table 1).

| Parameters                  | Breeding season – Gon | Off breeding season - Goff |
|-----------------------------|-----------------------|----------------------------|
| Milk production media (litre) | 5.59 ± 0.10<sup>a</sup> | 5.29 ± 0.06<sup>b</sup> |
| Persistence of lactation (months) | 6.12 ± 0.11<sup>b</sup> | 6.65 ± 0.09<sup>a</sup> |

<sup>a, b</sup> different letter within the same line indicate difference in media.

The lower average milk production verified in animals that calved during the off breeding season (spring and summer) can be mainly explained with the depressive effects of high temperatures at the debut of lactation (Catillo *et al.* 2002). The same research on Italian buffaloes showed that the calving season affects only milk yield: particularly, a relevant difference (about 1 kg of milk/day) can be observed between summer and winter calvings, whereas the other two seasons are in intermediate position. Buffaloes with increase on corporal temperature has alteration of comportment, showing food ingest diminution, increase of water ingest and necessity of areas fresh and whet (McGovern and Bruce, 2000). Good ambient condition allows the animals to increase their food ingestion and productive efficiency. According to McGovern and Bruce (2000), the increase of food ingestion can improve the cow milk production. Another explanation is that on pasture conditions, during the autumn and winter, the animals haven’t sufficient forage to assure enough body fat throughout the gestation. Thus, it is possibly that calved buffalo on the spring and summer did not have
good corporal condition to guarantee their milk production during the negative energetic balance period. Notwithstanding, after this period, the animal increase their food ingestion, have ad libitum pasture and might produce milk for longer time than calved buffalo on the autumn and winter.

The number of calving affect the average milk production but not the persistence of lactation (Table 2). The lower average milk production of buffaloes at first calving was according to the expected. The animals of first calving need higher nutritional requirement to maintenance than the other group, and then, had lower energetic supplement to support their milk production.

| Parameters                       | First calving | Second calving | More than two calving |
|----------------------------------|---------------|----------------|-----------------------|
| Milk production media (litre)    | 5.05 ± 0.11b  | 5.32 ± 0.10ab  | 5.49 ± 0.07a          |
| Persistence of lactation (months)| 6.37 ± 0.18   | 6.40 ± 0.20     | 6.51 ± 0.09           |

a, b different letter within the same line indicate difference in media.

It is important mention that to the buffalo have satisfactory milk production during the off breeding season is necessary to assure good environmental conditions as temperature comfort. Than is possibly to the buffaloes increase the food ingestion and optimize the nutritional energy to milk production.

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