

## INFLUENCE OF BIOLOGICAL FACTORS ON PERSISTENCY OF LACTATION IN NILI - RAVI BUFFALOES

Khalid Zafar Gondal, Nazir A. Chaudhry, and Rashid A. Chaudhry

The study was undertaken to ascertain the effect of age, season of calving, calving interval and lactation period on the persistency of lactation in Nili-Ravi buffaloes. The persistency was the lowest (0.8033) in the 1st lactation and the highest (0.9498) in the 2nd lactation. Spring calvers were higher in persistency (0.927) than those calving in any other season. The buffaloes with calving interval between 501-550 days showed the highest persistency (0.9202). The lactation period of 351-400 days resulted in higher persistency value (0.9196). The combined effect of all the four factors on persistency of lactation was also found to be significant.

### INTRODUCTION

Persistency of lactation is one of the main factors controlling the total milk yield in dairy animals, and is influenced by various genetic and environmental factors. Age has a significant effect on persistency of lactation in buffaloes (Asker and Bedeir, 1961 and Raizada *et al.* 1971). Similar findings have been reported by Cianci and Montemurro (1963) and Gill *et al.* (1970) in cows. Deeking (1965) and Wood (1968) reported a significant effect of season of calving on persistency of lactation. A significant effect of calving interval on persistency of lactation in cows buffaloes has been reported by Mahadevan (1951) and Asker and Bedeir (1961). A correlation between persistency of lactation and lactation period has been reported by Blau (1961) and Cianci (1963) in cows and by Dave and Taylor (1971) in buffaloes.

No work has been done in Pakistan as regards the persistency of lactation in buffaloes. It was, therefore, planned to study the influence of the relevant factors on the lactation performance of buffaloes, to find out their contribution towards persistency.

### MATERIALS AND METHODS

The lactation records of the Nili-Ravi buffaloes herd maintained by the Department of Livestock Management, University of Agriculture, Faisalabad

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\* Department of Livestock Management, University of Agriculture, Faisalabad.

from 1961-1975, were used in the study. The production of first 300 days was considered for analysis. The lactations less than 300 days or affected by diseases etc, were not included. Seventy two lactations of forty two buffaloes were available, which fulfilled these requirements. The persistency values were calculated by the formula derived by Ludwick and Petersen (1943).

The influence of age on persistency of lactation was studied in terms of lactation number and the records from first to seventh lactation were included. To study the effect of season of calving, the lactations were arranged according to the month of calving into four seasons (i) Spring season (March to May); (ii) Summer season (June to August), (iii) Autumn season (September to November) and (iv) Winter season (December to February). The calving intervals and lactation periods varied from 400 to 650 days and 300 to 500 days respectively. They were classified into five groups for calving interval and four groups for lactation period with a difference of 50 days. The data of the persistency values so arranged, were subjected to statistical analysis to study the effect of each of the said factors on persistency of lactation. To study the effect of all the four factors combined together, a multiple regression analysis was carried out by the use of Doolittle technique given by Steel and Torrie (1960).

## RESULTS

The average persistency index of first lactation was lowest (0.8033) and highest (0.9498) in second lactation. Analysis of variance revealed that age in the terms of lactation number had a significant ( $P < 0.01$ ) effect on persistency of lactation. Although the group of buffaloes calving during spring season (March to May) showed the highest (0.927) persistency than those calving during any other season yet the analysis of variance gave a non-significant result.

The buffaloes with calving interval between 501—550 days showed the highest average persistency values (0.9202). The statistical analysis revealed that calving interval significantly ( $P < 0.05$ ) affected the persistency of lactation. The highest average persistency (0.9196) was observed in the group of buffaloes with lactation period of 351 - 400 days. The length of lactation period had a significant ( $P < 0.05$ ) effect on persistency of lactation.

The effect of environmental factors when studied individually was not adequate, therefore whole of the data was pooled together and a multiple regression analysis was carried out (Table 1).

Table I. *Regression Analysis for Lumped Data.*

Source of variation	D.F.	S.S.	M.S.	F. Ratio
Regression co-efficient for four factors	4	0.045944	0.011486	6.873728**
Age in terms of lactation number	1	0.014773	—	8.841**
Season of calving	1	0.012138	—	7.264**
Calving interval	1	0.009016	—	5.396*
Lactation period	1	0.010017	—	5.995*
Residual	67	0.111979	0.001671	
Total :	71	0.157923		

\*\* = Significant ( $P < 0.01$ ).\* = Significant ( $P < 0.05$ ).

It is evident from the table that age and season of calving had a significant ( $P < 0.01$ ) effect while calving interval and lactation period showed a significant ( $P < 0.05$ ) effect. The effect of all the four factors combined together on persistency of lactation was also significant ( $P < 0.01$ ).

### DISCUSSION

The factors studied in the present investigation can be classified into two groups, according to their effect on persistency of lactation. The first group includes age and season of calving which showed a significant effect. The second group which indicated significant effect ( $P < 0.05$ ) comprises of calving interval and lactation period.

The persistency index of the buffaloes in second lactation was highest and thereafter decreased. Similar findings in buffaloes were reported by Asker and Bodeir (1961) and Raizada *et al.* (1971). The workers (Cianci and Montemurro, 1962 and Gill *et al.* 1970) on dairy cows reported it to be other way. The probable reason for this difference may be attributed to the effect of certain hormones before maturity, development of udder, hormones of pregnancy, and species difference e.g. late maturity in buffaloes. Although the month of calving exerted a significant effect on persistency of buffaloes, yet buffaloes calving during different seasons differed slightly in the persistency indices. These results are in agreement with those of Decking (1965) and Wood (1968) who reported that persistency was influenced by month of calving in cows. The difference in atmospheric temperature and availability of fodder are the main factors for the seasonal variation in the persistency. The proper feeding and housing of buffaloes during different seasons, may reduce the seasonal variance to a great extent. An increase in the calving

interval and lactation period was responsible for increasing the persistency of lactation. Similar results in cows have been reported by Mahadevan (1951), Blau (1961) and Cianci (1963) and in buffaloes by Asker and Bedeir (1961) and Dave and Taylor (1971). The effect of these factors may be attributable to the fact that by increasing the calving interval and lactation period, the effect of pregnancy on the later part of lactation is eliminated.

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