FACTORS AFFECTING SOME ECONOMIC TRAITS IN MURRAH BUFFALOES

Reetu Tewari*, D Kumar, CB Singh, Harpal Singh and CV Singh
Department of Animal Genetics and Breeding, College of Veterinary & Animal Sciences,
Pantnagar-263145 (India)
E-mail: reetuupmanyu@gmail.com (*Corresponding Author*)

Abstract: An investigation was undertaken utilizing the records on 577 daughter-dam pairs of Murrah buffaloes for studying the least squares means of some first lactation traits and the effect of farm, period, season, and sire on these traits. Least-squares means of age at first calving (AFC), first calving interval (FCI), first lactation milk yield (FLMY), first lactation period (FLP), weight at first calving (WFC) and first service period (FSP) of daughters were 43.38 ± 0.94 months, 418.14 ± 17.16 days, 1903.37 ± 60.67 kg, 326.43 ± 7.89 days, 509.93 ± 6.93 kg and 134.99 ± 17.11 days, respectively. The corresponding values in case of dam's observations were observed as 40.87 ± 0.84 months, 415.46 ± 18.52 days, 1835.85 ± 65.43 kg, 275.46 ± 8.06 days, 491.10 ± 7.76 kg, and 132.61 ± 18.29 days. The sire did influence the AFC, FCI, FLMY and FLP traits significantly in case of daughter's observations. The effect of sire on WFC and FSP trait was found non-significant. The farm did significantly influence the FLMY and WFC traits, whereas AFC, FCI, FLP and FSP traits were not influenced by the farm in case of daughter's observations. Similar effects were also observed in case of dam's observations except the effect of farm on AFC and FLP traits.
Keywords: Factors affecting, First lactation traits, production traits, Reproduction traits

Introduction

The performance of the buffaloes should also be assessed over different locations/farms, period, season and according to sires used. Therefore, an investigation was planned for studying the performance of different first lactation traits viz. age at first calving, first calving interval, first lactation milk yield, first lactation period, weight at first calving and first service period and variations according to different genetic and non-genetic factors.

Material and Method

The data on 577 daughters-dams pairs of Murrah buffaloes were used in the present investigation for studying Least squares (LS) means of age at first calving, first calving interval, first lactation milk yield, first lactation period, weight at first calving and first service period traits and effect of sire, period, season and farm on these traits. Daughters of 68 sires were located at seven military dairy farms and one Instructional Dairy farm, viz. Ferozepur, Ambala, Jallandhar, Jhansi, Lucknow, Bareilly, Agra and Pantnagar, and were

distributed over 34 years (1960-1993). The dams records were collected from Meerut military farm too which produced the daughters (577) over a period of 39 years (1954-1992). The data on various daughters were grouped into five periods of seven years each and three viz. rainy season (July– October), winter season (November – February) and summer season (March – June). The dam's observations were grouped into six periods of seven years each and three seasons viz. rainy season (July – October), winter season (November – February) and summer season (March – June). The 300-day milk yield was obtained by regressing the first lactation yield on lactation period and age at first calving. Data were analyzed by using the Mixed Model Least-Squares and Maximum Likelihood Programme (LSMLMW) of Harvey [5].

Result and Discussion

Means and factors affecting first lactation traits

The factors affecting first lactation traits for daughters and dams presented in Table 1 and 2, respectively.

Means

The least squares mean of age at first calving was estimated as 43.38 ± 0.94 months for daughters. Dutt *et al.* [3] and Sachan *et al.* [10] also reported same value for AFC traits. The value of least squares means observed in this study for dams (40.87 ± 0.84 months) agreed with the report of Dahiya [1]. Saini *et al.* [11] reported higher mean value of AFC traits than the results of this study.

The least-squares means of first calving interval (FCI) for daughters and dams were estimated to be 418.14 ± 17.16 days and 415.46 ± 18.52 days, respectively. These estimates were in accordance with the report of Saini *et al.* (2003), however, lower than those as reported by Dahiya [1] and Sachan *et al.* [10]. The average value of first lactation milk yield (FLMY) in case of daughters was found as 1903.37 ± 60.67 kg. Sethi [12] also reported the similar values for FLMY traits. The average value of FLMY for dams (1835.85 ± 65.43 kg) was comparable with the report of Kuralkar and Raheja [7].

The least squares mean of first lactation period (FLP) was estimated as 326.43 ± 7.89 days for daughters. Pander *et al.* [8] also reported same value for FLP trait. The figure of least squares means observed in this study for dams (275.46 ± 8.06 days) was similar with the report of Sachan *et al.* The least squares means of weight at first calving (WFC) for daughters and dams were estimated to be 509.93 ± 6.93 kg and 491.10 ± 7.76 kg, respectively. These estimates were in accordance with the report of Dahiya [1].

The average value of first service period (FSP) for daughters and dams were 134.99 ± 17.11 days and 132.61 ± 61 days, respectively. Saini *et al.* [11] and Sethi [12] also reported similar values for FSP traits.

Factors affecting first lactation traits

The effect of sire on AFC, FCI, FLMY, and FLP trait was significant in both daughter's and dam's observations. The effect of sire on WFC and FSP trait was found non-significant except the effect of sire on FSP traits in case of dam's observations. These results agreed with the report of Jain and Sadana [6]. The differences among these mean values of different first lactation traits under study were due to different genetic worth of the sires.

The farm did significantly influence the FLMY and WFC traits, whereas AFC, FCI, FLP and FSP traits were not influenced by the farm in case of daughter's observations. Similar effects were also observed in case of dam's observations except the effect of farm on AFC and FLP traits. The effect of farm on first lactation traits was reported to be significant by Dass and Sadana [2] for FLMY, FLP, and FCI; Gogoi *et al.* [4] for AFC and Dahiya [1] for WFC in Murrah buffaloes. However, the effect of farm was found to be non-significant by Pander *et al.* [8] for FLMY and FLP, and Dahiya (2006) for AFC. The differences in mean value of first lactation traits according to farm could be due to the differences in environmental factors, housing conditions, feeding schedules and others managemental fluctuations at different lactations.

The effect of period of calving was found to be significant for all the traits in case of daughter and dam's data. The effect of period was found to be significant as reported by Dass and Sadana [2] for FLMY, FCI and FLP; Saini *et al.* [11] for AFC, FSP and FCI and Dahiya [1] for AFC traits. The differences in period means for various first lactation traits could be reflection of total environmental factors in a time. The feeding systems and managemental conditions were not same over different periods. The season did not significantly influence any first lactation traits except the AFC trait, whereas the effect was found to be significant in case of observation of dam's only.

Table 1. Least-squares analysis of variance of first lactation traits of daughters

Source of Variation	d.f.	Mean Sum of Squares (M.S. value)					
		AFC	FCI	FLMY	FLP	WFC	FSP
Sire	67	390.84**	34993.67**	728892.33**	39125.33**	27573.21	17023.58
Farm	7	239.68**	36250.55	1333296.87**	14827.87	14591.99**	25328.13
Period	4	65.44**	35852.21**	266390.83**	434451.62**	80693.09**	48620.18**
Season	2	91.60**	8152.72	42730.11	488.03	147.01	3744.42
Error	496	42.38	13992791.28	17476293.21	2958.15	2284.16	139079832.37

** P < 0.01

AFC = Age at First Calving, FCI = First Calving Interval, FLMY = First Lactation Milk Yield, FLP = First Lactation Period, WFC = Weight at First Calving, and FSP = First Service Period

Table 2. Least-Squares analysis of variance of first lactation traits of dams

Source of Variation	d.f	Mean Sum of Squares (M.S. value)					
		AFC	FCI	FLMY	FLP	WFC	FSP
Farm	8	132.65**	15743.99	62652142.32**	5791.11	15332.01**	11325.37
Period	5	709.94**	19079321.01**	570653142.06**	10597.36**	8638.32**	85930.14**
Season	2	187.87**	6.9719	534.84	407.85	4947.43	42.02
Error	494	27.73	132424.61	164721314.20	29005.04	2321.70	12873981.26

** P < 0.01

AFC = Age at First Calving, FCI = First Calving Interval, FLMY = First Lactation Milk Yield,
FLP = First Lactation Period, WFC = Weight at First Calving, and FSP = First Service Period

Conclusions

The average value of age at first calving , first calving interval , first lactation milk yield , first lactation period , weight at first calving and first service period in case of of daughters were 43.38 ± 0.94 months, 418.14 ± 17.16 days, 1903.37 ± 60.67 kg, 326.43 ± 7.89 days, 509.93 ± 6.93 kg and 134.99 ± 17.11 days and in case of dams were found as 40.87 ± 0.84 months, 415.46 ± 18.52 days, 1835.85 ± 65.43 kg, 275.46 ± 8.06 days, 491.10 ± 7.76 kg, and 132.61 ± 18.29 days, respectively. Some traits indicated variation according to farm, period, season, and sire.

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