PEAK YIELD AND DAYS TO ATTAIN PEAK YIELD OF DAIRY COWS UNDER FIELD CONDITION*

Jakir Hussain, R. Roychoudhury, D. C. Mili, G. C. Das[1] and R. N. Goswami[2]
Department of Livestok Production and Management
College of Veterinary Science, Assam Agricultural University,
Khanapara, Guwahati-781022

Received : 08.01.2015 Accepted : 30.06.2015

ABSTRACT

The present investigation was done through field recording of milk production of milch cows reared by the farmers in and around the greater Guwahati of Kamrup district of Assam. The cows in first lactation were included for the study. The least-squares means of peak milk yield were 8.775 ± 0.194, 11.025 ± 0.194 and 2.500 ± 0.194 liters and days to attain peak milk yield were 32.650 ± 1.182, 35.650 ± 1.182 and 28.600 ± 1.182 days for Jersey X Local, Holstein Friesian X Local and Local cows of Assam respectively under field condition. The effect of genetic group was highly significant ($p<0.01$) on peak milk yield and days to attain peak milk yield. Significantly highest peak milk yield was observed in Holstein Friesian X Local cows. The days to attain peak milk yield in the Local cows was significantly the lowest. The effect of season of calving was significant ($p<0.05$) on peak milk yield only. The mean peak milk yield of cows calved in South -West monsoon season was significantly higher than those calved during winter season.

Key words: Peak milk yield, Jersey cross, Holstein Friesian cross

INTRODUCTION

Peak yield and days to attain peak yield are two important early expressed traits that affect the lactation milk yield and thereby economy of rearing dairy cows. Moreover peak yield of dairy cows may be used as a measure of milk production potential, persistency, prediction of lactation yield, shape of lactation curve and can effectively be used as early expressed trait for selection and culling of dairy cows (Thakur and Singh, 2000). Information regarding peak yield and days to attain peak yield of dairy cows under field condition is very meagre. Therefore, the present study was conducted to estimate these two traits of dairy cows under field condition of Assam so that it might be helpful for early selection as well as for appropriate care and management during early stage of lactation.

MATERIALS AND METHODS

Daily milk production of 20 Jersey X Local, 20 Holstein Friesian X Local and 20 Local cows at first lactation were recorded by personal visit to farmers' households in and around greater Guwahati of Kamrup district of Assam during four different seasons of the year viz. Summer monsoon: March to May (S1), South -West monsoon: June to September (S2), Post-monsoon: October to November (S3) and Winter: December

*Part of M.V.Sc. Thesis of the first author.

1 Professor, Deptt.of Animal Genetic and Breeding, CVSc, AAU, Khanapara, Guwahati-781022.
2Dean, CVSc, AAU, Khanapara, Guwahati-781022
drjakir@gmail.com

to February (S4). In every season, daily milk yield of 15 cows (5 of each genetic group) were recorded. From the records, peak yield was noted and days to attain peak yield was calculated from date of calving to the day on which peak yield was obtained. The data were subjected to least-squares analysis of variance (Harvey, 1975) and pair-wise comparison of means was done by Duncan's Multiple Range Test (DMRT) as modified by Kramer (1957).

RESULTS AND DISCUSSION

The least-squares means of peak yield were 8.775 ± 0.194, 11.025 ± 0.194 and 2.500 ± 0.194 liters and days to attain peak yield were 32.650 ± 1.182, 35.650 ± 1.182 and 28.600 ± 1.182 days for Jersey X Local, Holstein Friesian X Local and Local cows respectively (Table 1). Peak yield in Jersey X Local cows was similar to the report of Koul et al. (1977) and Pramanic et al. (2000) and the peak yield of Holstein Friesian X Local cows was comparable with the observation of D' Souza et al. (1979). But the peak yield of Local cows was less than the reports of Deshpande and Singh (1977) and Singh and Sukhla (1986) in indigenous cows. Singh and Kumar (2007) found much more peak yield (15.51 kg) in the first parity of Karan Fries cow. The days to attain peak yield of Jersey X Local and Holstein Friesian X Local cows were less than the report of Raheja (1982) in Jersey crossbred and Holstein Friesian crossbred cows; whereas, days to attain peak yield for Local cows was closer to the finding of Deshpande and Singh (1977) in Deoni cows.

The least-squares analysis of variance revealed highly significant ($p<0.01$) effect of genetic group on peak yield and days to attain peak yield. In agreement with the present findings, Gogoi (1991) also observed significant effect of genetic group; while, Singh et al.(1993) failed to detect significant effect of genetic group on these two traits in crossbred cows. The results of DMRT showed significantly highest peak yield in Holstein Friesian X Local cows followed by Jersey X Local and Local cows. Days to attain peak yield was also highest in Holstein Friesian X Local cows and it differed significantly from Local cows, but it did not differ significantly from Jersey X Local cows. Significantly lowest peak yield and days to attain peak yield in Local cows might be attributed to their inferior genetic make up as well as poor feeding and management practices under field condition.

The least-squares analysis of variance proved that effect of season of calving was significant ($p<0.05$) on peak yield and non-significant on days to attain peak yield. Arora et al. (1996), Zaman et al. (1998) and Singh et al. (2011) reported significant effect of season of calving on peak yield. On the other hand Singh et al. (1993) failed to find out any significant effect of season of calving on peak yield as well as days to attain peak yield. However, Gogoi (1991) observed that season of calving highly significantly affected days to attain peak yield and non-significantly peak yield. The results of DMRT revealed significantly lowest peak yield in S4 season calvers and difference among S1, S2 and S3 calvers was non-significant. The lowest peak yield in S4 calvers might be due to scarcity of green fodders during the winter season.

SUMMARY

The least-squares means of peak yield were 8.775 ± 0.194, 11.025 ± 0.194 and 2.500 ± 0.194 liters and days to attain peak yield were 32.650 ± 1.182, 35.650 ± 1.182 and 28.600 ± 1.182 for Jersey X Local, Holstein Friesian X Local and Local cattle of Assam respectively under field condition. The effect of genetic group was highly significant ($p<0.01$) on peak yield and days to attain peak yield. Significantly highest peak yield was observed in Holstein Friesian X Local cows. The effect of season of calving was significant ($p<0.05$) on peak yield only. The mean peak yield of cows calved in South -West monsoon season was significantly higher than those calved in winter season.

Table 1: least-square means (± se) of peak yield and days to attain peak yield in first lactation

Effects	N	Peak yield in first lactation in liters	Days to attain peak yield in first lactation
μ	60	7.433 ± 0.112	32.300 ± 0.683
Genetic group		**	**
Jersey X Local	20	8.775 ± 0.194b	32.650 ± 1.182a
Holstein Friesian X Local	20	11.025 ± 0.194a	35.650 ± 1.182a
Local	20	2.500 ± 0.194c	28.600 ± 1.182b

Sub-class means in a column with at least one common superscript do not differ significantly.
** Highly significant (P<0.01) and * Significant (P<0.05)

REFERENCES

Arora, C. L., Singhal, R. A., Garg, R. C. And Subraminian, N. B. (1996). Age at first calving in Frieswal cows and its influence on first lactation milk traits; Indian J. Anim. Sci., 66:1067-1069

Deshpande, K. S. and Singh, B. P. (1977). Genetic studies in Deoni cattle II. Lactation milk yield, peak yield and days to reach peak yield; Indian Vet. J., 54:727-731

D' Souza, C., Bhat, P. N. and Mukundan G. (1979). Genetic studies on some important economic traits in Red Sindhi and its crosses; Indian J. Anim. Sci., 49:247-250

Gogoi, D. N. (1991). Genetic evaluation of Jersey, Red Sindhi and Jersey X Red Sindhi cattle in Assam; M.V.Sc. Thesis, Assam Agricultural University, Ghuwahati-781022.

Harvey, W. R. (1975). Least squares analysis of data with unequal subclass mumbers; Agric. Research Service 20, U.S.D.A., Beltsvile, Maryland.

Koul, G. L., Kaushik, S. N. and Katpatal, B. G. (1977). Studies on peak yield and days to attain peak yield in crossbred cows; Indian J. Dairy Sci., 30:151-153

Kramer, C. Y. (1957). Extension of multiple range tests to group correlated adjusted means; Biometrics, 13: 13-18.

Pramanic, A. K., Samanta, A. K., Pyne, A. K. and Samanta, M. K. (2000). Effect of breed, lactation order and season of calving on 300 days lactation and peak yield in crossbred cows in West Bengal; Indian Vet. J., 77: 1091-1092

Raheja, K. L. (1982). Note on days to attain peak yield in Hariana and its half breds; Indian J. Anim. Sci., 52: 565-566

Singh, A. and Kumar, A. (2007). Prediction of 305-day milk yield based on peak yield and

pre-peak period in Karan Fries cows; Indian J. Anim. Res. 41:299-301

Singh, J. and Sukhla, K. P. (1986). Relationship of lactation persistency with some economic traits in Gir cattle; Indian Vet. J., 63: 494-499

Singh, V. P., Singh, R. V. and Singh, C. V. (1993). Genetic and non-genetic factors affecting milk production efficiency traits in Sahiwal and its crossbred with Jersey and Red Dane; Indian J. Dairy Sci., 46: 5-8

Singh, U., Kumar, A. and Khanna, A. S. (2011). Performance of Hariana cattle in its native tract; Indian Vet. J. 88(2):40-42

Thakur, Y. P. and Singh, B. P. (2000). Factors affecting peak yield in Jersey cows; Indian J. Dairy Sci., 53: 57-59

Zaman, G., Das, D., Roy, T. C. and Aziz, A. (1998). Genetic studies on peak yield and days to attain peak yield in Jersey cattle of Assam; Indian J. Dairy Sci., 51: 268-271