

## MONTHLY TEST DAY MILK YIELDS AND FIRST LACTATION MILK YIELDS OF CROSSBRED CATTLE OF KERALA

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**Abstract:** The present investigation was carried out to study the average production performance of first lactation milk yield in crossbred cattle of Kerala. In this study records of first lactation monthly test-day yields and first lactation milk yields of 936 crossbred cattle sired by 188 bulls spread over a period of 16 years (2002-2017) were collected from registers of ICAR-Field Progeny Testing Scheme of Kerala. The present study revealed that the average first lactation milk yield in crossbred cattle was  $2579.24 \pm 16.93$  kg with 471.43 kg and 18.28 % of standard deviation and coefficient of variation, respectively. Highest monthly test day milk yield was observed in TD-2 (10.81Kg) and lowest in TD-10 (5.24 Kg). The standard deviation and coefficient of variation for monthly test-day milk yields ranged from 1.63kg (TD-9) to 2.24 kg (TD-1) and 20.10% (TD-2) to 26.45% (TD-9), respectively. Selection of genetically superior animal for milk production by using individual monthly test-day milk yields rather than first lactation milk yield had many advantages like reduction in cost of data recording, time and generation interval.

**Keyword:** Monthly test day milk yield, first lactation milk yield and crossbred cattle.

### INTRODUCTION

The dairy cattle of Kerala are crossbreds and most of them are maintained under the small holder production system. A systematic milk recording and evaluation process is absent in the state. The productivity and profitability of dairy enterprises depend on accurate production records of the cows. First lactation milk yield (FLMY) is the most important trait for accessing the superiority of cows. As the daily milk records are not available and also that daily milk recording is not possible due to economic and management reasons, prediction of the FLMY is attempted from test day milk yield of various stages of lactation. The assessment FLMY of crossbred cattle of Kerala is important for that fact that, crossbred constitutes more than 95% of cattle of the state. Furthermore the crossbreeding policy for dairy cattle of this state is in force since five decades and an assessment of production potential of the cows is the need of the hour. Study of variation in production of crossbred cattle will give an idea about effectiveness of application of selection procedure for future genetic improvement of the stock.

## MATERIALS AND METHODS

The milk yield data and pedigree information were collected from the history sheets and milk record registers of ICAR-Field Progeny Testing Scheme, Kerala. The records on monthly test-day and first lactation milk yields of 936 crossbred cattle sired by 188 bulls spread over a period of 16 years (2002-2017) were collected. The records of the crossbred cattle of known pedigree and with normal lactation were included in the present study. Records of lactation not less than 100 days and not less than 500 kg lactation milk yield were only considered in the present investigation. The calving should be under normal physiological conditions. After standardization, the numbers of crossbred cattle in first lactation were reduced 936 to 835. Crossbred cattle having history of abortion, still birth, infertility and other reproductive problems were not included in the present study. Animal under experimental studies were also not included in the present study. All the records each trait was normalized with mean  $\pm$  3 SD. After normalization, the number of crossbred cattle in first lactation were reduced 835 to 816.

The present study having ten test days record with average interval of 30 days. The first test day recorded on 20<sup>th</sup> day after calving then remaining test days were recorded on 50<sup>th</sup>, 80<sup>th</sup>, 110<sup>th</sup>, 140<sup>th</sup>, 170<sup>th</sup>, 200<sup>th</sup>, 230<sup>th</sup>, 260<sup>th</sup> and 290<sup>th</sup> day of lactation (MTDMY-1 to MTDMY-10, respectively). The analysis of data was done with the help of SPSS version 23 available at Centre for Advanced Studies in Animal Genetics and Breeding, Mannuthy, Thrissur. The means, standard errors, standard deviation and coefficients of variation of all production traits were estimated by using standard statistical procedures suggested by Snedecor and Cochran (1994).

## RESULTS AND DISCUSSION

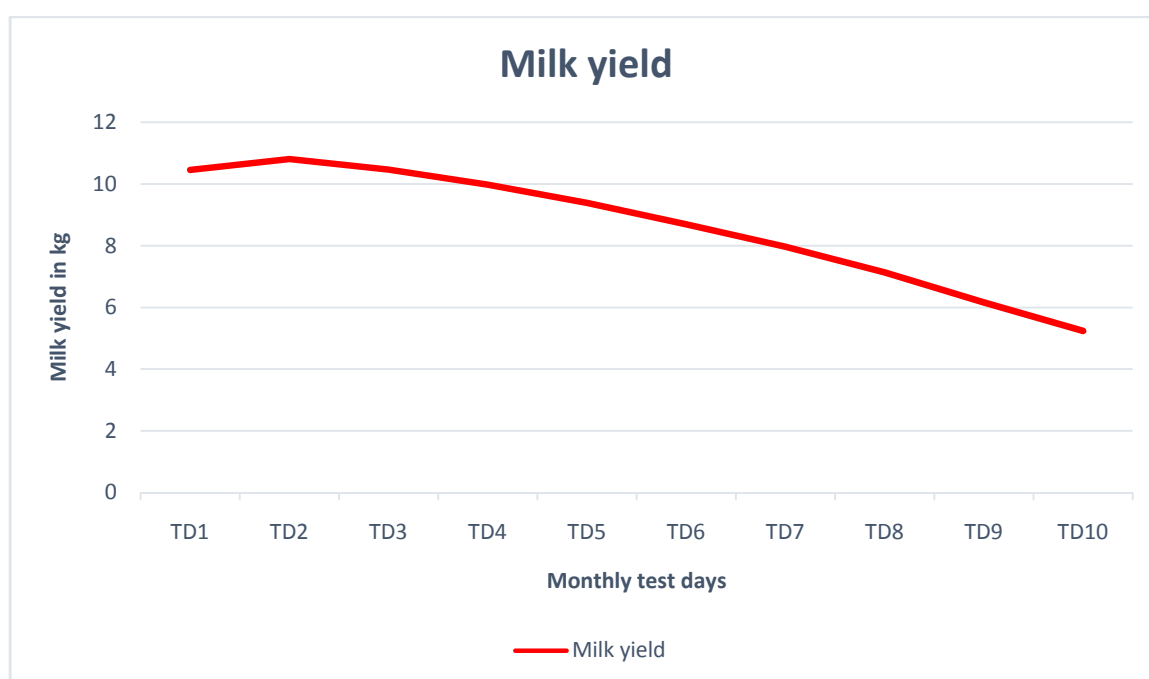
Simple means along with their standard errors (S.E.), standard deviation (S.D.) and coefficient of variation (C.V.) for first lactation monthly test day milk yields (MTDMY) and first lactation milk yields (FLMY) were presented in Table 1.

**Table 1:** Average, SE, SD and CV of MTDMY and FLMY

Traits	Mean $\pm$ S.E (Kg)	S.D (Kg)	C.V (%)
MTDY-1	10.46 $\pm$ 0.08	2.24	21.47
MTDY-2	10.81 $\pm$ 0.07	2.17	20.10
MTDY-3	10.47 $\pm$ 0.07	2.15	20.53
MTDY-4	9.98 $\pm$ 0.07	2.07	20.74

MTDY-5	9.39±0.07	1.95	20.82
MTDY-6	8.69±0.06	1.84	21.24
MTDY-7	7.97±0.06	1.77	22.17
MTDY-8	7.14±0.06	1.70	23.80
MTDY-9	6.16±0.05	1.63	26.45
MTDY-10	5.24±0.06	1.68	22.02
FLMY	2579.24±16.93	471.43	18.28

**Figure 1:** Average monthly test day milk yields



The average first lactation milk yield in crossbred cattle was 2579.24±16.93kg with 471.43 kg and 18.28% of standard deviation and coefficient of variation respectively. Tomar *et al.* (1996) in Sahiwal, Anon (2000) in Sunandini and Prakash *et al.* (2017) in crossbred cattle of Kerala reported values near to that average value. However, this estimate was lower than the values reported by Anilkumar (2017) in crossbred progenies of test bulls of ICAR-FPT scheme. There estimates was higher than the values reported by Sambhaji (2009) in Karan Fries cattle and Thomas and Anilkumar (2009) in crossbred cattle of Kerala. The differences in the estimates of average MTDY and FLMY in crossbred cattle reported by many researchers could have been due to sampling variations, herd differences or time and period of data collected.

Highest monthly test -day milk yield was observed in TD-2 (10.81Kg) and lowest in TD -10 (5.24 Kg). In general, monthly test day milk yield increased till TD-2 and thereafter a gradual decline was noticed till the end of lactation. The standard deviation and coefficient of variation for monthly test-day milk yields ranged from 1.63kg (TD-9) to 2.24 kg (TD-1) and 20.10% (TD-2) to 26.45% (TD-9) respectively. This C.V indicates that less variability so subsequent test day milk yield having persistent yield with less variation. Similarly by Rekaya *et al.* (1999) in Holstein Friesian cattle, Sambhaji (2009) in Karan Fries cattle also reported that highest monthly test -day milk yield was observed in TD-2 and lowest in last test day.

### **Conclusion**

The genetic improvement in milk production traits of Indian cattle can be done by selection and crossbreeding. Selection of genetically superior animal for milk production by using individual monthly test-day milk yields rather than first lactation milk yield had many advantages. It will reduce cost of data recording, time and generation interval for animal breeding improvement programme. The average milk yield per day from crossbred cows in India as a whole was 7.15 kg and the average milk yield per day from crossbred cows in Kerala was 8.46 kg (1.30 kg. higher than the All India yield). This shows the genetic superiority of crossbreds of the state compared to average production of crossbred cattle of the country.

### **Acknowledgments**

The author gratefully acknowledges The Director, Centre for Advanced Studies in Animal Genetics and Breeding, for giving permission for publication of this article.

### **References**

- [1] Anilkumar, K. 2017. *Annual progress report on field progeny testing scheme*. Centre for Advanced Studies in Animal Genetics and Breeding, Mannuthy, Kerala, 16p.
- [2] Anon. 2000. Annual Report. Kerala Livestock Development Board, Ministry of Animal Husbandry and Dairying, Government of Kerala, Thiruvananthapuram, 85p.
- [3] Prakash, G., Anilkumar, K., Tina, Shalu, Ponnala A.K., Dorjay. 2017. Evaluation of breeding bulls with different exotic inheritance. In: Prakash, G. (ed.), Proceedings of 9<sup>th</sup> Kerala Veterinary Science Congress; 11<sup>th</sup> to 12<sup>th</sup> November, 2017, Nedumdassery, Kochi. Indian Veterinary Association Kerala. pp. 248-249.

- [4] Rekaya, R., Carabano, M. J. and Toro, M.A. 1999. Use of test day milk yield records for genetic evaluation of production traits in Holstein Friesian cattle. *Livestock Prod. Sci.* **57**: 203-217.
- [5] Sambhaji, K.L. 2009. Genetic evaluation of Karan Fries sires based on test-day milk yield records. M.V.Sc Thesis, National Dairy Research Institute, Karnal, India, 41p.
- [6] Snedecor, G.W. and Cochran, W.G. 1994. Statistical Methods. Oxford and IBH Publ. Co., New Delhi, India.
- [7] Thomas, N. and Anilkumar, K. 2009. Evaluation of Ten Sire Families of Crossbred Dairy Cattle of Kerala Based on Milk Production and Milk Composition Traits. *Vet. Wld.* **2**: 10-12.
- [8] Tomar, A.K.S., Prasad, R.B. and Bhadula, S.K. 1996. First lactation performance of Holstein, Sahiwal and their half-breds in Tarai region of Northern India. *Indian J. Anim. Res.* **30**: 129-133.