

Full Length Research Paper

Studies on the productive performance of jersey x sahiwal cows in Chittoor district of Andhra Pradesh

A. Reddy Varaprasad^{1*}, T. Raghunandan², M. Kishan Kumar³ and M. Gnana Prakash³

¹Sri Venkateswara Veterinary University, Tirupati, India.

²Livestock Research Institute, College of Veterinary Science, Rajendranagar, Hyderabad, Andhra Pradesh, India.

³Department of Animal Genetics and Breeding, College of Veterinary Science, Rajendranagar, Hyderabad, Andhra Pradesh, India.

Accepted 8 April, 2013

Season of birth and age at sexual maturity had a non-significant effect on first lactation milk yield. The overall least-squares mean lactation milk yield was 2154.07 ± 16.88 L. Significant effect of batch was found on first lactation milk yield in the present study. Cows belonging to 4th batch recorded significantly ($P < 0.0$) higher lactation milk yield of 2475.93 ± 19.65 L. The effects of season of birth and age at sexual maturity were found to have no-significant effect on lactation length. The overall least-squares mean value for lactation length was 300.16 ± 0.06 days.

Key words: Progeny Testing Programme, lactation milk yield, peak yield, age at sexual Maturity.

INTRODUCTION

Chittoor District of Andhra Pradesh has 1.10 million cattle, out of which 0.56 million are Jersey X Sahiwal crosses (18th Livestock census - 2007). Progeny Testing Programme was started in the year 1987 in Chittoor district and at present most of the cattle are stabilized at 50% Jersey X Sahiwal level. This breed is considered to be highly adoptable to hot and humid conditions, average milk yielder and well adapted to management conditions of Chittoor district. However, there is a dearth of information on the performance of these animals. Hence, in the present study the productive performance of Jersey X Sahiwal cattle in Chittoor district was studied.

MATERIALS AND METHODS

Data obtained from progeny testing programme

A total number of 1,411 records from 1994 to till date were collected From the Deputy Director (AH), Progeny Testing Programme

Chittoor. The data is categorized into six batches according to the mode of progeny Testing Programme running at Chittoor:

- I. Batch- AI was started in July 94 and milk recording for the calves born out of AI was started during 1997-99;
- II. Batch- AI was started in May 96 and milk recording for the calves born out of AI was started during 1999-01;
- III. Batch- AI was started in July 98 and milk recording for the calves born out of AI was started during 2001-04;
- IV. Batch- AI was started in July 2001 and milk recording for the calves born out of AI was started during 2004-07;
- V. Batch- AI was started in July 2003 and milk recording for the calves born out of AI was started during 2006-08
- VI. Batch- AI was started in July 2005 and milk recording for the calves born out of AI was started during 2008 to till to date.

The data pertaining to lactation milk yield and lactation length were collected from the available records.

Data collection

Twenty three villages are selected for the study according to the

*Corresponding author. E-mail: reddyptp@yahoo.co.in

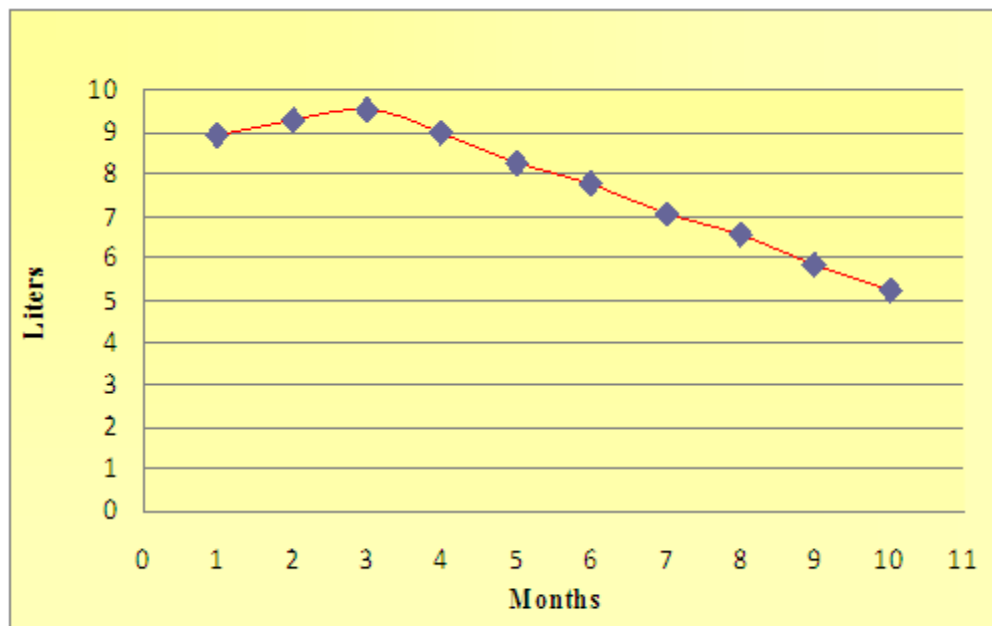


Figure 1. Lactation curve.

services offered by the Animal Husbandry department; 63.16, 26.32 and 10.52% farmers in the selected mandals are covered by Veterinary Dispensary, Rural Livestock Unit and gopalamitra, respectively. Data on the productive performance of animals maintained by the farmers were collected by interviewing them to arrive at values by memory recall method. A total of 190 farmers from 8 mandals in and around Chittoor where the Progeny Testing Programme is going on since two decades were interviewed. The family members of the farmers were also involved in collection of the data for more accuracy. The productive parameters include lactation length (LL), lactation milk yield (LMY), days to attain peak yield and peak yield. Data recorded on 1411 J X S cows under the progeny testing program were subjected to least-squares analysis through SPSS (10.0) software package.

RESULTS AND DISCUSSION

A non-significant influence of season of birth was observed on first lactation milk yield which ranged from 2132.10 to 2194.37 L. Similarly, non-significant effect of season of birth was reported by Thakur and Singh (2000, 2001) in Jersey X Red Sindhi and Jersey X Tharparkar cows respectively. The average peak yield calculated in the study is 9.51 L and the lactation curve is presented in the Figure 1. The highest mean FLMY was found in cows born during rainy season (2194.37 ± 16.66 L) followed by cows born during winter (2135.75 ± 19.57 L) and summer (2132.10 ± 14.19 L). The highest milk yield recorded in cows born in rainy season could be because of the availability of abundant green fodder and favorable climatic conditions. In contrast, summer born cows recorded less milk yield, which might be due to exposure to hot, dry climate and non availability of green fodder

during summer season.

Significant ($P \geq 0.01$) effect of batch was found on lactation milk yield with the cows of fourth batch yielding the highest milk yield (2475.93 ± 19.65 L) followed by cows in sixth (2295.51 ± 16.85 L) and fifth (2272.17 ± 18.51 L) batch, which could be due to genetic differences among the cows. Cows of 1st and 2nd batches recorded significantly less milk among cows of all the batches (1952.27 ± 16.15 and 1953.78 ± 12.72 L, respectively), which might be due to severe drought conditions prevailing during that period. In general, the range of milk yield recorded in this investigation was on par with the mean lactation milk yield reported by Thakur and Singh (2000, 2001).

The effect of age at sexual maturity was non-significant on first lactation milk yield. The cows of ASM group-1 (400-600) were found with higher first lactation milk yield of 2198.04 L, followed by those of ASM group-2 where in the milk yield was 2132 kg.

The overall least-squares mean first lactation milk yield (2154.07 L) (Table 1) obtained in this study was on par with the means reported by Bhadauria and Katpatal (2003) in Holstein Friesian X Sahiwal cows (2097.27). However, higher mean lactation milk yields of 2796.33 and 2697 ± 25.8 L were reported by Tomar et al. (1996) in Holstein Friesian X Sahiwal cows and Reshmi and Stephan (2010) in Sunandini cows. Shubha Lakshmi et al. (2010) reported that the overall least squares means for lactation yield and 300 days lactation milk yield were 2864.30 and 2593.84 kg, respectively in Sahiwal Freisian crossbreds. The differences in lactation milk yield across the literature and in the present study could be due to the

Table 1. Least squares analysis of lactation milk yield (LMY).

Source of variation	d.f	Sum of squares	Mean sum of squares	F value
Batches	5	50806699.05	10161339.81	38.23**
Season	2	1031712.60	515856.30	1.94 ^{ns}
ASM group	3	148677.33	49559.11	0.18 ^{ns}
Error	1400	372041691.80	265744.06	
Total	1410	424028780.80		

**Significant at $P < 0.01$; ns = non-significant.

Table 2. Least squares analysis of lactation length (LL).

Source of variation	d.f	Sum of squares	Mean sum of squares	F value
Season	2	1.439	0.720	0.55 ^{ns}
ASM group	3	0.720	0.240	0.18 ^{ns}
Error	425	552.97	1.30	
Total	430	555.13		

ns = Non-significant.

differences in the inheritance levels of exotic germplasm, environment and also due to the differences in the management especially pertaining to the feeding level.

From these findings it was found that the cows with early sexual maturity (Batch-4), early age at first calving and optimum gestation period recorded higher lactation milk yield, which is as per the natural trend observed in dairy cattle. This could also be due to the inheritance from new sires that were inducted in to the progeny testing programme. The cows in batches 1 to 3 recorded lower milk yield comparatively. The variation in milk yield observed among cows reared under different batches indicate the significant effect of genetic grades and genotype and environmental interactions which effect the expression of milk yield of different animals. The average peak yield calculated in the study are is 9.51 liters in Jersey X Sahiwal cows in First lactation milk yield and it is comparable with the observations of Deshmukh et al. (1995) in Jersey X Sahiwal and Zaman et al. (1998) in Jersey.

The effects of season of birth and age at sexual maturity were found to have non-significant effect on lactation length. The longest lactation length of 300.26 ± 0.14 days was observed in cows born during winter season followed by those born during summer (300.15 ± 0.07) and rainy (300.08 ± 0.10 days) seasons. The overall least-squares mean value for lactation length was 300.16 ± 0.06 days (Table 2). Among the four age groups of age at sexual maturity, the mean lactation length ranged from 300.07 ± 0.12 to 300.20 ± 0.11 days. The present finding is within the range of values reported in literature by Singh and Sharma (1984) and Thakur and Singh (2005) in Holstein Friesian X Sahiwal cows. ASM group had no significant effect on lactation length.

Conclusion

Season of birth and age at sexual maturity had a non-significant effect on first lactation milk yield. Significant effect of batch was found on first lactation milk yield in the present study. However, the farmers are advised for proper planning to breed their cows results in calves born which are well acclimatized to the existing environment. Cows belonging to 4th batch recorded significantly higher lactation milk yield of 2475.93 ± 19.65 L. The effects of season of birth and age at sexual maturity were found to have non-significant effect on lactation length.

REFERENCES

- Bhadauria SS, Katpatal BG (2003). Effect of genetic and non- genetic factors on 300 day milk yield of first lactation in Friesian X Sahiwal crosses. Indian Vet. J. 80:1251-1254.
- Deshmukh DP, Choudari KB, Deshpande KS (1995). Non genetic and genetic factors affecting production efficiency traits in Jersey, Sahiwal and Jersey X Sahiwal cows. Indian J. Dairy Sci. 48:85-88.
- Reshmi RC, Stephen C (2010). Evaluation of Lactation milk Yield in Crossbred cattle. Indian Vet. J. 87:363-334
- Shubha Lakshmi B, Ramesh Gupta B, Gnana Prakash M, Sudhakar K, Lt. Col. Susheel Sharma (2010) Genetic Analysis of the Production Performance of Frieswal Cattle. Tamil Nadu J. Vet. Anim. Sci. 6(5)215-222.
- Singh CSP, Sharma DB (1984). Comparative studies on Friesian X Sahiwal cows and buffaloes lactation length, milk yield, and milk producing efficiencies. Indian Med. Vet. J. 9:115-117.
- Thakur YP, Singh BP (2000). Performance evaluation of Jersey X Zebu crossbreds involving different indigenous breed performance of Jersey X Tharparkar crossbreds. Indian Vet. J. 77:169-171.
- Thakur YP, Singh BP (2001). Performance evaluation of Jersey X Sindhi crossbreds. Indian Vet. J. 78:62-63.
- Thakur YP, Singh BP (2005). Factors affecting first lactation milk yield traits in Jersey cows. Indian J. Anim. Res. 39:115-118.
- Tomar AKS, Prasad RB, Bhadula SK (1996). First lactation

performance of Holstein X Sahiwal and their halfbreds in Tarai region of Northern India. *Indian J. Anim. Res.* 30:129-133.

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