

PRODUCTIVE PERFORMANCE OF JERSEY X SAHIWAL COWS IN CHITTOOR DISTRICT OF ANDHRA PRADESH

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ABSTRACT

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 liters (Lt). 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 (Lt) of 2475.93 ± 19.65 . The effects of season of birth and age at sexual maturity were found to have non-significant effect on lactation length. The overall least-squares mean value for lactation length was 300.16 ± 0.06 days.

Keywords: Progeny Testing Programme, lactation milk yield, peak yield, age at sexual Maturity

Chittoor District of Andhra Pradesh has 1.10 million cattle, out of which 0.56 million are Jersey X Sahiwal crosses³. At present most of the cattle in Chittoor District are stabilized at 50% Jersey X Sahiwal level with Progeny Testing Programme. 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 (J X S)cattle in Chittoor district was studied.

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 and VI batch- AI was

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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.

Twenty three villages are selected for the study according to the services offered by the Animal Husbandry department. 63.16, 26.32 and 10.52 per cent farmers in the selected mandals are covered by Veterinary Dispensary, Rural Livestock Unit and Gopalmitra (lay inseminators in Andhra Pradesh), 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, Age at sexual Maturity. Data recorded on 1411 J X S cows under the progeny testing program were subjected to least-square analysis through SPSS (10.0) software package.

$$Y_{ijk} = \mu + S_i + P_j + A_k + e_{ijk}$$

μ = overall mean

S_i = Effect of i^{th} season

(Summer = Mar-Jun; Rainy = Jul-Oct;

Winter = Nov-Feb)

P_j = Effect of j^{th} batch

(1:1994-96; 2: 1996-98; 3: 1998-01;

4: 2001-03; 5: 2003-05; 6: 2005-07)

A_k = Effect of k^{th} ASM (1:400-600; 2:601-800; 3: 801-1000; 4: 1001-1200 days).

e_{ijk} = Random error distributed with mean zero and variance σ^2 .

A non-significant influence of season of birth was observed on first lactation milk yield (FLMY)

which ranged from 2132.10 to 2194.37 liters (Lt). Similarly, non-significant effect of season of birth was reported in Jersey X Red Sindhi and Jersey X Tharparkar cows respectively^{7 & 8}. The average peak yield calculated in the study was 9.51 liters and the lactation curve is presented in the Fig.1. The highest mean FLMY was found in cows born during rainy season (2194.37 \pm 16.66 lt) followed by cows born during winter (2135.75 \pm 19.57lt) and summer (2132.10 \pm 14.19 lt). 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 ($P \leq 0.01$) effect of batch was found on lactation milk yield with the cows of fourth batch yielding the highest milk yield (2475.93 \pm 19.65) followed by cows in sixth (2295.51 \pm 16.85) and fifth (2272.17 \pm 18.51 liters) 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 \pm 16.15 and 1953.78 \pm 12.72 lts ,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 at par with the mean lactation milk yield^{7 & 8}.

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 liters, followed by those of ASM group-2 where in the milk yield was 2132 Liters.

The overall least-squares means of first lactation milk yield (2154.07 Lt) (Table 1) obtained in this study was at par with earlier reports¹. However, higher mean lactation milk yields of 2796.33 and 2697 \pm 25.8 liters were reported in Holstein Friesian X Sahiwal cows¹⁰ and in Sunandini cows⁴. It was also reported that the

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overall least squares means for lactation yield and 300 days lactation milk yield were 2864.30 and 2593.84 kg, respectively in Sahiwal Freisian crossbreds⁵. The differences in lactation milk yield across the literature and in the present study could be due to the 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 earlier observations^{2 & 11}.

Table 1. Least squares Analysis of Lactation Milk yield (FLMY)

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 $P \leq 0.01$; ns= Non-significant

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)

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

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^{6 & 7}. ASM group had no significant effect on lactation length.

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 liters. The effects of season of birth and age at sexual maturity were found to have non-significant effect on lactation length.

REFERENCES

1. Bhaduria, S. S., and Katpatal, B. G., 2003. Effect of genetic and non- genetic factors on 300 day milk yield of first lactation in Fresian X Sahiwal crosses. *Indian Veterinary Journal* **80**: 1251-1254.
2. Deshmukh, D. P., Choudari, K. B., and Deshpande, K. S., 1995. Non genetic and genetic factors affecting production efficiency traits in Jersey, Sahiwal and Jersey X Sahiwal cows. *Indian Journal of Dairy Science* **48**: 85-88.
3. Quinquennial Livestock Census (18) 2007 provided by Department of Animal Husbandry, Andhra Pradesh - Hyderabad.
4. Reshmi, R. C., and Stephen., 2010. Evaluation of Lactation milk Yield in Crossbred cattle, *Indian Veterinary Journal* **87**: 363-34.
5. Shubha Lakshmi B, Ramesh Gupta B, Gnana Prakash M, Sudhakar K and Lt. Col. Susheel Sharma 2010 Genetic Analysis of the Productuon Performance of Frieswal Cattle. *Tamilnadu Journal of Veterinary & Animal Science* **6** (5) 215-222.
6. Singh, C. S. P., and Sharma, D. B., 1984. Comparative studies on Friesian X Sahiwal cows and buffaloes lactation length, milk yield, and milk producing efficiencies. *Indian Medical Veterinary Journal* **9**: 115-117.
7. Thakur, Y. P., and Singh, B. P., 2000. Performance evaluation of Jersey X Zebu crossbreds involving different indigenous breed performance of Jersey X Tharparkar crossnbreds. *Indian Veterinaty Journal* **77**: 169-171.
8. Thakur, Y. P., and Singh, B. P., 2001. Performance evaluation of Jersey X Sindhi crossbreds. *Indian Veterinary Journal* **78**: 62-63.
9. Thakur, Y. P., and Singh, B. P., 2005. Factors affecting first lactation milk yield traits in Jersey cows. *Indian Journal of Animal Research* **39**: 115-118.
10. Tomar, A. K. S., Prasad, R. B., and Bhadula, S. K., 1996. First lactation performance of Holstein X Sahiwal and their halfbreds in Tarai region of Northrern India. *Indian journal of Animal Research* **30**: 129-133.
11. 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 in Assam. *Indian Journal of Dairy Science* **51**: 268-271.

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