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PRODUCTION PERFORMANCE OF PHULE TRIVENI COWS

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ABSTRACT

The data on production performance of 1398 records of Phule Triveni cows maintained at Research Cum Development Project on Cattle, Rahuri were utilized for study. The least squares means of lactation milk yield (LMY), 300 days milk yield (300DMY), lactation length (LL) and dry period (DP) were worked out. The overall mean LMY, 300DMY, LL and DP in Phule Triveni were 3112.15 ± 25.79 kg, 2883.69 ± 20.48 kg, 336.47 ± 1.74 days and 82.34 ± 2.16 days respectively. The period of calving had significant (P<0.01) effect on all the traits under study. The season of calving had non-significant influence on all the traits. The lactation order had significant (P<0.01) influence on LMY and 300 DMY. The phenotypic and genetic correlations of LMY with 300DMY and LL and between 300DMY and LL were positive and significant.

Key words : Phule Triveni, lactation milk yield, lactation length.

Milk production is the result of interaction between genetic constitution of animal and its environment in which they thrive. Milk production is the major trait around which the economy of dairy animals revolves. Milk production criteria include various traits viz. total lactation milk yield, 300 days milk yield, lactation length etc. The production performance of crossbreds varies with the level of exotic inheritance. Among the native breeds Hariana, among the exotic breeds Holstein Friesian and among crosses ½ to 3/4th level of exotic inheritance gave highest milk production along with better reproductive efficiency. For viable dairy farms it is essential to finalize the level of exotic inheritance in crossbred cattle.

MATERIALS AND METHODS

The data pertains to 1398 records of 495 Phule Triveni cows (50% Holstein Friesian + 25% Jersey + 25% Gir) maintained at Research Cum Development Project (RCDP) on Cattle during the period of 37 years (1977-2013) were utilized for the present study. The least squares means of production traits viz., lactation milk yield (LMY), 300 days milk yield (300DMY), lactation length (LL) and dry period (DP) were worked out by considering period of calving (POC), season of calving (SOC) and lactation order (LO) as non-genetic factors[3].

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The Duncan's Multiple Range Test (DMRT) was used to make pair wise comparison between the least squares means[5]. The period of calving were divided as P_1 (1977-1981), P_2 (1982-1986) P_3 (1987-1991), P_4 (1992-1996), P_5 (1997-2001), P_6 (2002-2006) and P_7 (2007-2013). The calving was divided into three season's viz., rainy (June-September), winter (October-January) and summer (February-May). The records of five lactations were considered for the study. Simultaneously, the correlations among the production traits of cows were estimated.

RESULTS AND DISCUSSION

The least squares mean of LMY, 300 DMY, LL and DP in Phule Triveni cows are presented in Table1 and 2. The overall mean lactation milk yield in Phule Triveni cows was 3106.39 ± 48.19 kg. These results were in accordance with those reported in Gir crossbred cows[2].

The influence of period of calving on lactation milk yield was significant (P<0.01). Similar result was noticed in Phule Triveni[4]. The lactation milk yield of cows calved during P_2 (3599.88 ± 44.54 kg) was significantly higher than cows calved in P_7, P_6, P_4, P_5 and P_3 and at par with P_1. The variation due to season of calving in lactation milk yield was non-significant.

The difference due to order of lactation in lactation milk yield was significant (P<0.01). The LMY of cows in L_4 (3315.92 ± 79.53 kg) lactation was significantly higher than those calved in L_2 (2990.71± 60.28 kg) and L_1 (2750.95±55.64kg) lactation and at par with L_3 and L_5 lactations. The results revealed that lactation milk yield gradually increased up to L_4 lactation which declined during succeeding lactations. The gradual increased in milk yield from L_1 to L_4 lactation might be due to physiological development of cows and increased functioning activities of milk secretary tissues of mammary gland.

Table1. Least squares means of lactation milk yield and 300 days milk yield in Phule Triveni

Sources of variation	LMY (kg)			300DMY (kg)		
Population mean (μ)	N	Mean	S.E.	N	Mean	S.E.
	1398	3106.39	48.19	1396	2879.46	38.40
Period of calving						
P_1 (1977-81)	395	3329.52^{ab}	50.21	395	3157.50^{ab}	39.90
P_2 (1982-86)	416	3599.88^{a}	44.54	416	3288.33^{a}	35.39
P_3 (1987-91)	310	2681.35^{e}	52.63	310	2448.86^{e}	41.82
P_4 (1992-96)	178	3058.88^{cd}	66.92	178	2787.58^{cd}	53.18
P_5 (1997-01)	37	2786.91^{de}	146.77	37	2575.08^{de}	116.63
P_6(2002-06)	15	3085.62^{bc}	231.75	15	2886.46^{bc}	184.16
P_7 (2007-13)	47	3202.55^{bc}	131.20	45	3014.43^{bc}	106.52
Season of calving						
S_1(Rainy)	415	3117.05	60.80	414	2887.13	48.44
S_2(Winter)	536	3107.92	56.82	536	2892.55	45.19
S_3(Summer)	447	3094.19	59.12	446	2858.71	47.11
Order of lactation						
L_1	495	2750.95^{d}	55.64	493	2521.95^{d}	44.45
L_2	373	2990.71^{c}	60.28	373	2780.68^{c}	47.96
L_3	248	3239.96^{ab}	68.67	248	3018.17^{ab}	54.61
L_4	171	3315.92^{a}	79.53	171	3108.76^{a}	63.25
L_5	111	3234.39^{ab}	95.37	111	2967.75^{ab}	75.84

Means under each class in the same column with different superscripts differed significantly

The overall mean 300 days milk yield in Phule Triveni was 2879.46 ± 38.40 kg. The effect of period of calving on 300 days milk yield was significant (P < 0.01). The 300 DMY of cows calved during P_2 (3288.33 ± 35.39 kg) was significantly higher than calved in P_3 P_4, and P_5 and at par with P_1, P_7 and P_6. The influence of season of calving on 300 days milk yield was non-significant.

The difference due to lactation order in 300 days milk yield of Phule Triveni was significant (P < 0.01). Similar results were reported in Jersey x Sahiwal halfbreds[8]. The 300DMY of cows in L_4 lactation (3108.76 ± 63.25 kg) was significantly higher than L_1 and L_2 lactations and at par with L_3 and L_5 lactations. The 300 DMY gradually increased up to L_4 lactation which declined during succeeding lactations.

The overall mean lactation length in Phule Triveni was 334.18 ± 3.22 days. These results were in close agreement with that in HF x Gir halfbreds[1].

Table2. Least squares means of lactation length and dry period in Phule Triveni

Sources of variation	LL (days)			DP (days)		
Population mean (μ)	N	Mean	S.E.	N	Mean	S.E.
	1397	334.18	3.22	959	86.28	3.93
Period of calving						
P_1 (1977-81)	395	328.67^{c}	3.35	292	80.14^{bc}	3.36
P_2 (1982-86)	416	344.66^{ab}	2.97	296	70.12^{d}	3.01
P_3 (1987-91)	310	348.84^{ab}	3.51	203	72.24^{cd}	3.66
P_4 (1992-96)	178	354.54^{a}	4.47	120	76.81^{bc}	4.56
P_5 (1997-01)	37	339.75^{ab}	9.81	13	105.63^{a}	13.76
P_6 (2002-06)	15	312.46^{cd}	15.49	7	103.64^{a}	18.76
P_7 (2007-13)	46	310.35^{d}	8.86	28	95.37^{ab}	9.45
Season of calving						
S_1 (Rainy)	414	332.81	4.07	290	86.23	4.63
S_2 (Winter)	536	332.94	3.80	367	87.36	4.41
S_3 (Summer)	447	336.79	3.95	302	85.24	4.57
Order of lactation						
L_1	494	342.27	3.73	400	93.00	4.16
L_2	379	332.82	4.03	232	85.50	4.60
L_3	248	333.26	4.59	168	86.68	5.06
L_4	171	329.68	5.31	102	81.80	6.09
L_5	111	332.86	37.00	57	84.41	7.44

Means under each class in same column with different superscripts differed significantly

The variation due to period of calving in lactation length was significant (P < 0.01). The lactation length of cows calved during P_4 (354.54 ± 4.47 days) was significantly higher than those calved in P_1, P_6 and P_7 and at par with P_2, P_3 and P_5. The differences in lactation length among cows calved during P_2, P_3 and P_5 were at par with each other. The results revealed that lactation length gradually increased up to 4th lactation and thereafter declined in same manner.

The influences of season of calving and order of lactation on lactation length were non-significant. These results were in accordance with obtained in HF x Deoni crossbred cows[9]. The overall mean dry period in Phule Triveni was 86.28 ± 3.93 days. The effect of period of calving on dry period was significant (P < 0.01). The dry period of cows calved during P_5 (105.63 ± 13.76 days) and P_6 (103.64 ± 18.76 days) was significantly higher than those calved in P_1, P_2, P_3 and P_4 periods and at par with P_7 period. The variation due to season of calving and order of lactation in dry period were non-significant. These results were in agreement with obtained in FJH crossbreds[6].

The phenotypic and genetic correlations among production traits are presented in Table 3. The phenotypic correlations of LMY with 300 DMY (0.48) and LL (0.39) and between 300 DMY with LL (0.28) were positive and significant (P < 0.01). The present results revealed that with increase in the 300 DMY there was also increase in the LMY in Phule Triveni cows.

The genetic correlations of 300 DMY (0.35) and LL (0.25) with LMY were positive and significant. These results corroborated with reported in HF x Sahiwal halfbreds[7]. The genetic correlations between DP and 300 DMY (-0.08) and DP and LL (-0.02) were negative and non-significant.

The phenotypic correlations of 300 DMY (0.48) and LL (0.39) with LMY were positive and significant (P<.0.01) in Phule Triveni cows. The phenotypic correlations between DP and LMY (-0.07) and DP and 300 DMY (-0.06) were negative and non-significant.

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