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EFFECT OF AGE AT FIRST CALVING ON FIRST LACTATION PERFORMANCE OF SAHIWAL COWS

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The age and weight at first calving averaged 1236.58 days and 353.95 kg, respectively. Average first lactation 305-day milk yield and milk yield per day of lactation were 1896.03 and 6.53 kg, respectively. The pospartum oestrus interval, service period and number of services per conception averaged 160.04 days, 216.86 days and 2.13 days, respectively. The correlation and regression analysis revealed that age at first calving had non-significant effect on all parameters studied. the correlation and regression coefficient between age and weight at first calving were 0.052 and 0.012, respectively. The correlation coefficient between age at first calving and first lactation 305-day milk yield, yield per day of lactation, postpartum oestrus interval, service period and number of services per conception were 0.018, 0.038, -0.105, 0.087 and 0.051, respectively.

INTRODUCTION

Pakistan being an agricultural country has about 17.2 million head of cattle belonging to eight different breeds which contribute only 24% of the total milk produced annually because majority of the cattle population is reared for agricultural operations. The Sahiwal cattle are considered to be the best dairy animals in the tropics and subtropics due to their adaptability to varying climatic conditions. Although this breed in comparison to other local breeds produces good quantity of milk, yet the production is considerably low than the well-defined breeds of temperate region. The animals with low production are uneconomical and have delayed first calving and longer calving interval. These factors shrink the total productive life of the animals. This study has thus been planned to determine the effect of age at first calving on first lactation performance of Sahiwal cows.

MATERIALS AND METHODS

The breeding and milk yield records of Sahiwal cows kept at the Livestock Experiment Station, Khizarabad (District Sargodha) during the period 1980-88 were used. The data on the following traits of 112 first calvers were collected:

1. Date of birth
2. Date of first calving
3. Weight at first calving
4. Date of service after first calving
5. Date of drying
6. Milk yield

The abnormal lactations followed by stillbirth, abortion and less than 180 days length were considered abnormal and excluded from the study. Similarly, the record of animals which were culled or died during lactation and those which were positive to brucellosis/tuberculosis/other diseases were also excluded. The effect of age at first calving on first lactation 305-day milk yield, milk yield per day of lactation was studied.

The correlation coefficient between age at first calving (X_2) and first lactation milk yield (Y_2), milk yield per day of lactation (Y_2), postpartum oestrus interval (Y_3), service period (Y_4) and number of services per conception (Y_5) were worked out. The regression of the dependent variables Y_1, Y_2, Y_3, Y_4 and Y_5 on X_1 independent variable was also worked out (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Mean and coefficient of variation for age at first calving, first lactation 305-day milk yield, milk yield per day of lactation, postpartum oestrus interval, service period and number of services per conception for first calvers are given in Table 1.

early breeding. This suggests that at present level of husbandry practices, the first lactation milk yield is not adversely influenced by the age at first calving. Thus reduction in age at first calving in Sahiwal cattle will improve the economic feasibility and in no way will be injurious to milk production.

Effect of Age at First Calving on Various Performance Traits: The effect of age at first calving on various first lactation performance traits was studied by working out correlations between various traits and the regression analysis.

a. Weight at first calving: The mean weights at first calving as per class intervals of age at first calving have been given in Table 2. From the results it is evident that no specific trend exists between age and weight at first calving. The correlation coefficient between

Table 1. Mean and coefficient of variation of various first lactation performance traits

Traits	Number of observations	Mean	Range	C.V.*
Age at first calving (days)	112	1236.56	920-1832	14.69
First lactation milk yield (kg)	112	1896.03	1028-2871	19.44
Milk yield per day of lactation (kg)	112	6.53	4.0-10.5	19.61
Postpartum oestrus interval (days)	112	160.04	17-404	51.08
Service period (days)	112	216.86	17-614	54.96
Number of services per conception	112	2.13	1-9	74.23

*Coefficient of variation.

The results are in close proximity with those reported by Rao and Nagarcenkar (1981), Koul *et al.* (1985) and Dam *et al.* (1988). Non-significant effect of age at first calving on first lactation milk yield seems to be due to relatively higher age at first calving (40.5 months) in this herd. Delayed breeding ultimately alleviated untoward effects of

the two traits was 0.052 which was non-significant. Similar results were reported by Yadav and Balaine (1984) and Koul *et al.* (1985). Further regression analysis revealed that weight at first calving increases by 0.012 for each day increase in age at first calving.

b. First lactation milk yield: The relationship between age at first calving and first

lactation 305-day milk yield exhibits non-specific trend (Table 2). The correlation coefficient (0.018) between the two traits was non-significant (Table 3). There was also a non-significant increase of 0.036 kg for each day increase in age at first calving.

first calving (Table 3). The correlation coefficient between the two traits was 0.038 and regression of milk yield per day of lactation on age at first calving was 0.000. Both the estimates were non-significant.

Postpartum oestrus interval: The mean

Table 2. Means for first lactation traits as per class intervals of age at first calving

Age at first calving (months)	Number of calvings	Weight at first calving (kg)	First lactation 305-day milk yield (kg)	Milk yield per day of first lactation (kg)	Post-partum oestrus interval (days)	Service period (days)	Number of services per conception
<34	7	366.71	1977.00	6.90	182.57	219.42	1.57
34-36	13	329.84	1915.76	6.26	193.30	255.84	2.07
37-39	37	354.63	1900.36	6.35	166.00	238.86	2.47
40-42	17	360.58	1807.58	6.41	142.64	184.88	1.82
43-45	12	356.36	1904.90	6.70	162.81	215.45	2.27
46-48	9	350.22	1824.22	6.40	105.22	197.22	1.88
>48	17	333.41	1979.11	6.59	175.00	226.52	2.23

Table 3. Correlation and regression coefficients of various first lactation traits with age at first calving

Traits regressed	Number of records	Correlation coefficient	Regression coefficient (b_{yx})
Weight at first calving (kg)	112	0.052NS	0.012NS
First lactation 305-day milk yield (kg)	112	0.018NS	0.036NS
Milk yield per day of lactation (kg)	112	0.038NS	0.000NS
Postpartum oestrus interval (days)	112	-0.105NS	-0.046NS
Service period (days)	112	-0.087NS	-0.057NS
Number of services per conception	112	-0.051NS	-0.000NS

c. Milk yield per day of lactation: The data showed no specific trend for per day milk yield of first lactation when classified according to different class intervals of age at

postpartum oestrus interval as per class intervals of age at first calving are given in Table 2. The correlation and regression coefficients (Table 3) are -0.105 and -0.046,

respectively, between the two traits and both are non-significant. The results indicate that reduction in age at first calving will not impair an earlier onset of oestrus after first calving.

Service period: The mean service period for various class intervals of age at first calving has been given in Table 2. The data indicate that with increase or decrease in age, the service period after first calving does not change significantly and the age at first calving can be reduced successfully to increase the economic feasibility of this period. The correlation coefficient (-0.087) and regression coefficient (-0.057) between both the traits was statistically non-significant. Similar results were also reported by Tahir and Maarof (1988).

Number of services per conception: The data on number of services per conception did not show any specific trend with varying intervals of age at first calving (Table 2). The correlation coefficient between the two traits was -0.051 and regression of services per conception was -0.000 (Table 3). Both the observations i.e. correlation and regression were non-significant. These results indicate that reduction in age at first calving will greatly help in reducing the number of services per conception and to improve the economic feasibility of Sahiwal breed.

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