

## Performances of dairy heifers weaned at 30, 45 and 60 days of age

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### ABSTRACT

The effects of early weaning on age at first calving on the milk and milk fat yield characteristics of Brown Swiss and Holstein Friesian cattle were studied. The calves used in this study were weaned at 30, 45 and 60 days of age. The differences among the weaning groups concerning age at first calving, 305- day milk yield, the percentage of milk fat and 305 – day milk fat yield were found to be insignificant ( $P>0.05$ ). The results of this study suggested that early weaning of Brown Swiss and Holstein Friesian calves at 30 days of age would not have a detrimental effect on age at first calving and milk production traits.

**Key words:** Early weaning, Brown Swiss, Holstein Friesian, Milk Production

**Abbreviation key:** **BS** = Brown Swiss, **HF** = Holstein Friesian, **AFC** = age at first calving, **MY** = the first lactation 305- day milk yield, **MFY** = the first lactation 305-day milk fat yield, **PMF** = percent of milk fat

## INTRODUCTION

Studies (Quigley, 1996; Ugur and Yanar, 1998) indicated that dairy calves can be early weaned successfully. Most of these studies, the effects of weaning ages on reproductive and milk yield characteristics were not considered. Similarly, limited research has been published in Turkey on effects of the weaning ages on the reproductive and milk traits of dairy cattle (Yanar and Aydin, 2000). Purpose of this study was to investigate the effects of three different weaning ages on future age at first calving and the first lactation milk yield performances of Holstein Friesian and Brown Swiss female calves.

## MATERIALS AND METHODS

Data used in this study were collected 30 female Brown Swiss (BS) and Holstein Friesian (HF) cattle reared in the research Farm of Agricultural Faculty at Atatürk University, Turkey. The amount of daily whole milk given to the calves was 7 per cent of their birth weight, and this amount was kept constant during the milk-feeding period. Milk was offered to the calves once a day (every morning). The BS and HF calves were weaned at 30, 45 and 60 days of age. Animals were subjected to the same feeding and management practice between birth and end of the first lactation except for weaning ages. The first lactation 305-day milk yields from each heifer were calculated using the second method reported by IKEWM (Anonymous, 1976). Milk fat percent analyses were carried out on the milk samples, taken every month, by employing the method of Gerber (Kurt, 1972). The data were standardized for calving year and calving season. Statistical model used for multivariate analysis of variance (MANOVA) was (Johnson and Wichern, 1988):

$$Y_1, Y_2, Y_3, Y_4 = \mu + \alpha_I + \beta_J + (\alpha\beta)_{IJ} + e_{ijk}$$

Where:

$Y_1$  : age at first calving (AFC),  $Y_2$  : the first lactation 305- day milk yield (MY),  $Y_3$  : the first lactation 305- day milk fat yield (MFY),  $Y_4$  : percent of milk fat (PMF),  $\mu$ : overall mean,  $\alpha_i$  : effect of weaning ages ( $i = 1, 2, 3$ ),  $\beta_j$  : effect of breed ( $j = 1, 2$ ),  $\alpha\beta_{ij}$  : interaction effect, and  $e_{ijk}$  : error term. The data were statistically analyzed by SAS program (SAS, 1996).

### RESULTS AND DISCUSSION

The results are presented in Table 1 and Table 2. Means for the AFC of heifer weaned at 30, 45 and 60 days of age were  $29.7 \pm 1.3$ ,  $32.9 \pm 0.9$  and  $34.4 \pm 1.9$  months, respectively. The heifers weaned at 30 days of age gave birth much earlier than those weaned at 60 days of age in their first year of giving birth ( $*P < 0.05$ ). However, differences among the weaning age groups in terms of MY, MFY and PMF were non-significant (Table 2). Similar results were reported by Yanar and Aydın (2000).

The results of the present study suggest that weaning BS and HF calves as early as 30 days has no adverse effects on their age at first calving and milk yield traits.

Table 1. Means and standard error of means for AFC, MY, MFY and PMF

Factors	Levels	N	AFC	MY	MFY	PMF
			$\bar{X} \pm S_{\bar{X}}$	$\bar{X} \pm S_{\bar{X}}$	$\bar{X} \pm S_{\bar{X}}$	$\bar{X} \pm S_{\bar{X}}$
Weaning ages	30	9	29.7±1.3	2629.0±178	101.2±6.2	3.8±0.10
	45	12	32.9±0.9	2773.0±348	107.4±14.9	3.8±0.07
	60	9	34.4±1.9	2917.0±284	113.8±12.7	3.9±0.18
Breed	HF	13	32.5±1.3	3087.5±280	116.0±12.7	3.7±0.10
	BS	17	32.3±0.8	2532.2±192	100.9±8.1	3.9±0.08

Table 2. Bonferroni confidence intervals

Factors	AFC	MY	MFY	PMF
HF-BS	(-2.07, 2.45)	(96, 1016)*	(-5.18, 35.3)	(0.1, 0.44)*
30-45 days	(-0.61, 6.89)	(-529.1, 817.1)	(-23.4, 35.8)	(-0.22, 0.38)
30-60 days	(0.95, 8.37)*	(-251.7, 827.7)	(-20.9, 46.1)	(-0.27, 0.29)
45-60 days	(-2.23, 5.27)	(-529.1, 817.1)	(-23.2, 36)	(-0.21, 0.39)

\*: Differences among the factors are statistically significant (P<0.05)

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