

## Different Concentrate Feeds Application for Calves at After Weaning Period

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**Abstract:** Holstein-Friesian calves were divided into two groups. After weaning, the calves in the first group were fed with 2 kg/day and the calves in the second group were fed with 3 kg/day concentrate feed. The results showed that the effect of different various of concentrate feed application was insignificant on growth characteristics of calves. The average weight of six-month-old calves, and mean daily weight gains at the period between the birth and six months of age for the first group were 113.8±4.72 and 0.42±0.04 kg, and for the second group were 123.9±4.72 and 0.48±0.04 kg, respectively. Between birth and 6 months old ages, gains in body measurements, such as heart girth, body length, height at withers, chest depth and front shank circumference were not significantly influenced by groups of concentrate feed. Moreover, there were no problems associated with mortality in reared calves.

**Keywords:** Holstein-Friesian, Concentrate Feed, Weaning and Growth Characteristics

### Introduction

Holstein-Friesian is one of the European dairy cattle breeds which have been imported into Turkey to increase milk and beef production since 1960's. The Holstein-Friesian cattle have been mainly distributed in the western region of Turkey via various agricultural projects. Feeds constitute the biggest part of the expenditure of animal farming in the west of Turkey. Therefore, in concentrate feeding of calves, it is important that calves are supplemented with enough amounts of concentrate feeds, which will support liveability, and growth of calves. Several scientists suggested that calves should be supplemented with approximate 2 - 3 kg concentrate feed / day after weaning (Akman, 1998; Çakır *et al.*, 1981; Şekerden and Özkütük, 1990; Tüzemen, 1990). Moreover, Özhan (1991) indicated that concentrate feeding of calves should be performed with care provided that it is economically feasible and does not affect calves performance. The effect of concentrate feed supplementation exceeding 2 kg/day on the performance of Holstein-Friesian calves after weaning was investigated.

### Materials and Methods

Holstein-Friesian calves born in the Research Farm of Faculty of Agriculture at Çanakkale Onsekiz Mart University, Turkey were used. The calves were allowed to suckle their dams and received colostrum for three days. The amount of daily milk given to the calves was 7 per cent of their birth weight, and this amount was kept constant during the feeding period. Milk was offered to the calves once a day (every morning) as suggested by Yanar and Ockerman (1993). All Holstein-Friesian calves were weaned at 60 days of ages. The calves were divided into two groups. After weaning, the calves in the first group were fed with 2 kg/day and the calves in the second group were fed with 3 kg/day concentrate feed. The calves were housed in a building which specifically constructed for calves and contained individual pens furnished with feeders and milk - water buckets.

Two different calf starters were used. While one of them (Starter I) contained 17% crude protein, 7%

crude ash and 8% crude cellulose, the other one (Starter II) contained 15% crude protein, 9% crude ash and 12% crude cellulose. Starter 1 was fed from birth to two months of age, and starter 2 after 2 months of age. Dried hay in medium quality was offered to the calves *ad lib*. The body weights were determined and recorded at birth, weaning, 4 and 6 months of ages. Similarly, body measurements (heart girth, body length, height at withers, chest depth and front shank circumference) were determined and recorded at birth, weaning and 6 months of ages. Calves were separated to study groups based on their birth weights. The aim of this application was to have animals that were similar to each other in terms of birth weight. The experimental data were analysed statistically by using a 2 x 2 completely randomised factorial experimental design. The analysis were carried out by using the statistics package program (SAS, 1996).

### Results and Discussion

Data concerning various weights, daily gain in weight and gains in body measurements of Holstein-Friesian calves are presented in Table 1 and 2. The results indicates that the performance of Holstein-Friesian calves supplemented with 3 kg concentrate feed / day (2<sup>nd</sup> group) was greater than that of Holstein-Friesian calves supplemented with 2 kg concentrate feed / day (1<sup>st</sup> group). In fact, the average live weight of calves at 6 month of age receiving 3 kg concentrate feed/day was 10.1 kg higher than that those receiving 2 kg concentrate/day and the average live weight gain between birth and 6 month of age of calves of 2<sup>nd</sup> group was 0.06 kg higher. In addition, during the period from birth to 6 month of age, the calves of 2<sup>nd</sup> group had higher body measurement calves except for body length than those of the 1<sup>st</sup> group. But, all of these differences were not statistically significant ( $P>0.05$ ). Moreover, as in Table 1, birth weight of calves was higher than findings of Uğur *et al.* (1996) and Uğur and Yanar (1998). In this study, the average live weight of male and female calves, during the period between birth and 2 month of age, were found to be 0.35±0.04 and 0.40±0.04 kg, respectively.

**Ugur et al.:** Different Concentrate Feeds Applications for Calves at-after Weaning Period

Table 1: Least Squares Means and Standard Error of Means Weights, Daily Weight Gains and Amount of Milk Consumed of Calves

Items	Groups of Concentrate Feed		S	Sex		S
	1 <sup>st</sup> Group N=9 X±Sx	2 <sup>nd</sup> Group N=9 X±Sx		Male N=9 X±Sx	Female N=9 X±Sx	
<b>Weights (kg) at</b>						
Birth	40.8 ± 1.31	40.7 ± 1.31	NS	41.2 ± 1.31	40.1 ± 1.31	NS
2Months (Weaning)	62.2 ± 2.88	64.7 ± 2.88	NS	62.3 ± 2.88	64.6 ± 2.88	NS
4 Months	86.7 ± 3.1	87.0 ± 3.1	NS	85.8 ± 3.1	88.3 ± 3.1	NS
6 Months	113.8 ± 4.72	123.9 ± 4.72	NS	122.1 ± 4.72	115.6 ± 4.72	NS
<b>Daily Gain in Weight (kg)</b>						
Before Weaning	0.36 ± 0.04	0.39 ± 0.04	NS	0.35 ± 0.04	0.40 ± 0.04	NS
2 - 4 Month	0.40 ± 0.03	0.38 ± 0.03	NS	0.39 ± 0.03	0.39 ± 0.03	NS
2 - 6 Month	0.43 ± 0.03	0.49 ± 0.03	NS	0.49 ± 0.02	0.44 ± 0.03	NS
4 - 6 Month	0.46 ± 0.06	0.60 ± 0.06	NS	0.60 ± 0.06	0.45 ± 0.06	NS
Birth - 6 Month	0.42 ± 0.04	0.48 ± 0.04	NS	0.45 ± 0.04	0.44 ± 0.04	NS
Amount of Milk Consumed (kg) by calves	162.8 ± 5.3	162.5 ± 5.3	NS	163.9 ± 5.3	161.5 ± 5.3	NS

S: Significance, NS :Non-Significant, X±Sx : Mean ± Standard error of mean

These average values were similar to those of Jaster *et al.* (1991) and Yanar *et al.* (1994), but lower than those reported by Plaza and Fernandez (1993) and Uğur and Yanar (1998). Thus, the average weights of Holstein-Friesian calves at 2 month of age (weaning) were similar to the findings of Robert (1990).

During the period between birth and 6 month of age, the average live weight gain of Holstein-Friesian male and female calves were 0.45±0.04 and 0.44±0.04 kg, respectively. These findings were greater than those of Yanar *et al.* (1993) were, conversely, similar to the findings of Yanar *et al.* (1997). However, they were lower than those reported by Uğur and Yanar (1998) and Uğur *et al.* (1996). Moreover, least squares means for weights at four and six month of age of Holstein - Friesian calves used in this research were lower than those reported by Gaede (1983), Pozzo (1991), Yanar *et al.* (1994) and Müller and Botha (2000). Different management conditions in different farms could be for the variation in live weight of the animals. In the same farm, especially, in the period between two and six months of ages, use of better quality roughages and concentrate feeds may improve performance in terms

of live weight. In this study, gains in heart girth, body length, height at withers, chest depth and front shank circumference for calves were determined. The gains in body measurements of the calves in the first and second groups in the period between birth and six months of ages were 26.6±1.9 and 26.2±1.9 cm for body length, 16.6±2.1 and 20.2±2.1 cm for height at withers, 11.1±0.8 and 13.3±0.8 cm for chest depth, 34.6±3.0 and 39.8±3.0 cm for heart girth, 2.30±0.15 and 2.35±0.15 cm for front shank circumference, respectively. Between birth and 6 month of age in these bodies measurements were also found to be insignificant ( $P>0.05$ ) for groups of concentrate feed and sex (Table 2). The results obtained from this study that supplemented with 2 kg concentrate feed / day does not affect adversely the skeletal development of Holstein - Friesian calves.

There were no problems associated with mortality in reared calves in this research. According to the results of this study, it is possible that calves of Holstein-Friesian can be supplemented with 2 kg concentrate/day after weaning provided based on the quality of roughages.

**Ugur et al.:** Different Concentrate Feeds Applications for Calves at after Weaning Period

Table 2: Least Squares Means And Standard Error Of Means For Total Gains (Cm) In Body Measurements Of Calves

Items	Groups of Concentrate Feed			Sex		
	1 <sup>st</sup> Group N=9 X±Sx	2 <sup>nd</sup> Group N=9 X±Sx	S	Male N=9 X±Sx	Female N=9 X±Sx	S
<b>Birth - weaning</b>						
Body length	5.75±1.3	9.1±1.3	NS	9.4±1.3	5.5±1.3	*
Height at withers	3.7±1.1	7.0±1.1	NS	6.0±1.1	4.7±1.1	NS
Chest depth	4.6±0.6	4.0±0.6	NS	4.1±0.6	4.4±0.6	NS
Heart girth	11.2±1.2	13.7±1.2	NS	12.8±1.2	12.8±1.2	NS
Front Shank	1.21±0.13	1.11±0.13	NS	1.21±0.13	1.11±0.13	NS
Circumference						
<b>Weaning-6 month</b>						
Body length	18.8±1.7	17.1±1.7	NS	15.9±1.7	19.9±1.7	NS
Height at withers	15.4±1.5	10.9±1.5	NS	12.3±1.5	14.0±1.7	NS
Chest depth	8.7±0.6	7.5±0.6	NS	8.6±0.6	7.6±0.6	NS
Heart girth	21.2±3.1	28.7±3.1	NS	24.3±3.1	25.5±3.1	NS
Front Shank	1.33±0.17	1.33±0.17	NS	1.33±0.17	1.33±0.17	NS
Circumference						
<b>Birth - 6 month</b>						
Body length	26.6±1.9	26.2±1.9	NS	27.3±1.9	25.5±1.9	NS
Height at withers	16.6±2.1	20.2±2.1	NS	18.5±2.1	18.2±2.1	NS
Chest depth	11.1±0.8	13.3±0.8	NS	12.4±0.8	11.9±0.7	NS
Heart girth	34.6±3.0	39.8±3.0	NS	37.5±3.0	36.7±3.0	NS
Front Shank	2.3±0.15	2.35±0.15	NS	2.55±0.15	2.1±0.15	NS
Circumference						

S: Significance, \* : P<0.05, NS :Non-Significant, X±Sx : Mean ± Standard error of mean

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