

THE EFFECTS OF FEEDING CALVES WITH COLOSTRUM INSTEAD OF MILK AT WEANING

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Buzağların süt yerine kolostrum ile beslenmesinin sütten kesim dönemindeki etkileri

Özet: Bu çalışma, ticari değeri olmayan kolostrumu değerlendirebilmek ve süt yerine kolostrumla beslemenin etkilerini incelemek amacıyla yapılmıştır. Araştırma, özel bir işletmede yetiştirilen 40 adet Siyah-Alaca erkek buzağı üzerinde yürütülmüştür. Çalışmada 2 grup oluşturulmuş, birinci grup (deneme grubu) 1/3 oranında sulandırılmış kolostrumla, ikinci grup (kontrol grubu) sütle beslenmiştir.

Araştırmadaki deneme ve kontrol gruplarında doğum ağırlığı 40.9 kg ve 41.9 kg, sütten kesim (35. gün) ağırlığı 53.8 kg ve 53.6 kg, toplam yem tüketimi 12.3 kg ve 12.6 kg, günlük canlı ağırlık artışı 368.7 g ve 332.2 g düzeylerinde belirlenmiştir. Araştırma süresince her iki grupta da ölen buzağı bulunmamıştır. Çalışmada incelenen özellikler açısından, deneme ve kontrol grupları arasındaki farklılıklar istatistik bakımından önemsiz bulunmuştur.

Araştırma sonuçlarına göre, işletmelerin üretilen kolostrumu 1/3 oranında sulandırarak sütten kesim dönemine kadar buzağı beslemesinde kullanmaları önemli bir ekonomik fayda sağlayabilecektir.

Anahtar Kelimeler : Buzağı, kolostrum, sütten kesim, sütten kesim ağırlığı, gelişme.

Summary: This study was carried out to put colostrums, which did not have a commercial value to use and to examine the effects of feeding calves with colostrum instead of milk. In the study, 40 Holstein-Friesian male calves raised in a private farm were used. Two groups were formed. The first group (experiment group) was fed on colostrum which was 1/3 diluted with water and the second group (control group) was fed on milk.

In the experiment and control groups birth weights were 40.9 kg and 41.9 kg, weaning weights (35th day) were 53.8 kg and 53.6 kg, total feed consumptions were 12.3 kg and 12.6 kg and daily live weight gains were 368.7 g and 332.2 g, respectively. None of the calves in both of the groups died during the study. For the characters inspected in the study, the differences between the control and experiment groups were not statistically significant.

The results of the study show that an economical income could be provided for the farms by the use of colostrums, which was 1/3 diluted with water for the feeding of calves until weaning.

Key Words: Calve, colostrum, weaning, weaning weight, growth.

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Introduction

The most important traits causing productivity in cattle rearing are; cheap maintenance of the animals until productivity and economical supply of necessities (6).

The 88% of milk production (8 832 059 tones) is supplied by 5 489 043 milking cows in Turkey (4). This shows since colostrum has a 1% proportion in 305 days lactation it is 88 000 tones for Turkey.

According to the Turkish Nutrients Principles cow's milk collected 15 days prior calving till 7 days after calving and colostrum bearing milk cannot be used for human consumption (5). For this purpose colostrum is not a commercial item.

Colostrums is not only a rich nutrient for the newborn but also valuable for suckling calves. Cows produce more colostrum than their own calf needs. So, the excess amount can be used to feed other calves in the herd. Colostrum is very dense and must be diluted with water twice or three times before feeding (2).

Colostrum is an important nutrient for the resting lifetime of calves. Disease and mortality rates of calves received insufficient amounts of colostrum are higher. Wilson and Brigstocle (15) studied the mortality, diarrhoea and pneumonia rates of calves, which received very little or none, insufficient and normal amounts of colostrum. According to these diseases they have informed the following rates. Very little or non colostrum group 7.9%, 42.2% and 5.2%; insufficient colostrum group 3.0%, 24.2% and 3.2%; normal colostrum group 1.3%, 5.4% and 2.4% respectively.

The components of milk and colostrum are presented in Table 1 (8).

The real colostrums are obtained during the first three days of lactation. The milk of the fourth and the fifth days is considered transient milk and the milk gains its normal

Tablo 1. The components of colostrum and milk.

Substance	Colostrum			Milk
	1 st day	2 nd day	3 rd day	
Specific gravity	1.056	1.040	1.035	1.032
Dry matter (%)	23.9	17.9	14.1	12.9
Protein (%)	14.0	8.4	5.1	3.1
Casein (%)	4.8	4.3	3.8	2.5
IgG (mg/ml)	48.0	25.0	15.0	0.6
Fat (%)	6.7	5.4	3.9	3.7
Lactose (%)	2.7	3.9	4.4	5.0
Vitamin A (mg/l)	2590	1900	1130	340
Vitamin D (IU/g fat)	0.9 - 1.8	0.9 - 1.8	0.9 - 1.8	0.4
Riboflavin (mg/ml)	4.8	2.7	1.9	1.5
Choline (mg/ml)	0.70	0.34	0.23	0.13

composition after the sixth day. Calves can consume 10% milk of their body weight. The colostrum and the transient milk can cover an 8-10 days milk demand of a calf. The colostrum can be kept for a week in refrigerator or a year in deep-freeze without losing its quality (13).

This study was performed to investigate the effects of feeding calves with colostrum on body growth instead of milk during their suckling period, to achieve cheaper maintenance to the calf and increasing the profit of the company by sending more milk to market.

Materyal ve Metod

Male Holstein-Friesian calves served as the material of the study. Forty single born male calves of heifers were ear-tagged and their birth weights were recorded for this purpose.

After receiving colostrums during their first 3 days, the calves were taken to individual pens, which were supplied with 18% protein and 2800 kcal/kg energy bearing calf grower ration and water. Daily intakes of the calves were calculated.

Two research groups were randomly established containing 20 calves each. Control group (milk fed) calves received 4 litres of milk divided into two daily doses between 4-28th days, and 2 litres only at evenings between the days 29-35. Experimental group (colostrums fed) calves received the some amount of 1/3 diluted colostrums for a some period of time. All calves of both groups were weaned at the 35th day. The fattening program applied to the calves in the study is presented in Table 2.

The experiment group calves were fed with the resting colostrum of newly delivered cows for 3 days after feeding her own calf with 4 litres of colostrum.

Tablo 2. The fattening program applied to the calves in the study.

Groups	Days		
	0-3	4-28	29-35
Experiment (Colostrum)	Colostrum	Colostrum (1/3 diluted with water) 2 litres in the morning and 2 litres in the evening, calf feed, water (<i>ad-libitum</i>)	Colostrum (1/3 diluted with water) - 2 litres in the evening, calf feed, water (<i>ad-libitum</i>)
Control (Milk)	Colostrum	Milk 2 litres in the morning and 2 litres in the evening calf feed, water (<i>ad-libitum</i>)	Milk - 2 litres in the evening, calf feed, water (<i>ad-libitum</i>)

Calves were bucked fed daily with fresh colostrum. The colostrum was diluted with warm water and given to the calves at 37°C. Weekly weighing followed body developments of the calves and weaning weights at 35th day were determined.

The survival rate, total fed consumption live weight gain and weaning weights were investigated in the study. SPSS program was used for statistical analysis and importance controls of the differences between the groups were done by *t-test* (7).

Results and Discussion

In this study colostrum was investigated to be an alternative replacer to milk until weaning. There was an experiment (colostrum) and a control (milk) group to which the calves were selected randomly with live weights of around 40.9 kg and 41.9 kg. The weaning (35th days) weights of the calves were 53.8 kg for the colostrum and 53.6 kg for the milk fed groups.

The levels of the inspected characteristics of the calves in the study are presented in Table 3.

Table 3. The levels of the inspected characteristics of the calves in the study.

Characteristics	Groups			
	Experiment (Colostrum) (n=20)		Control (Milk) (n=20)	
	\bar{X}	$S_{\bar{x}}$	\bar{X}	$S_{\bar{x}}$
Birth weight (kg)	40.9	4.78	41.9	3.42
Weaning weight (kg)	53.8	5.80	53.6	4.59
Daily live weight gain (g)	368.7	107.80	332.2	108.80
Feed consumption until weaning (kg)	12.3	3.68	12.6	4.00

Total feed intake till weaning was 12.3 kg for the experiment and 12.6 kg for the control group calves, daily weight gain of these groups were 368.7 g and 332.2 g respectively.

During the study there was no dead calves in either groups.

Differences in all the traits were statistically insignificant between the milk and colostrums fed groups.

Birth and weaning values of the calves in this study have been similar to the values of some studies (1, 3, 10, 16).

In spite, the daily weight gain and total feed consumption averages did not have statistically significant differences between each other; less feed was consumed to gain more weight in the colostrum-fed group. These results are in accordance with the results of studies in which Holstein-Friesian calves have been used (3, 9, 14). Since there was no mortality in both groups, the survival rate values of this study were higher than other

studies (1, 11, 12). Higher survival rate in the colostrum group supports the results of Wilson and Brigstocke (15).

Conclusion

According to the results of this study, calves after having been fed by their mothers colostrum can be continued to be fed with diluted colostrum of other newly delivered cows until weaning without any deleterious effect on weaning weight, live-weight gain, feed intake and survival rate. With these results colostrum can be suggested to replace milk in calf feeding for a more economical management.

Colostrums can be evaluated more profitably in farms with high cow numbers where simultaneous births and more colostrum production than need take place. Companies can employ this system to lower their calf feeding costs.

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