Journal of Animal and Veterinary Advances 7 (6): 728-730, 2008
ISSN: 1680-5593

A Study on the Development of the Schedule for Early Weaning of the Brown Swiss Calves at Suitable Live Weight

[1]Feyzi Ugur, [2]Mine Dosay Akbulut and [3]Mete Yanar
[1]Department of Animal Science, Faculty of Agriculture,
Canakkale Onsekiz Mart University, 17020, Canakkale, Turkey
[2]Department of Medical Biology and Genetics,
Faculty of Veterinary Medicine, Kocatepe University, Afyonkarahisar, Turkey
[3]Department of Animal Science, Faculty of Agriculture,
Ataturk University, 25240, Erzurum, Turkey

Abstract: With this study, it was aimed to form a breeding schedule, suggesting to weaning the calves at 35 days age and at the most suitable live weight. Brown Swiss calves weaned at 35 days age were separated into three groups. Calf groups which gained 10-20, 21-29 and 30-50% live weight based on birth weight at weaning time were named as G1, G2 and G3, respectively. The average weight gain of the groups between birth and weaning periods, were obtained as 15.2±1.9, 25.9±2.4 and 40.3±1.9%, respectively ($p = 0.00$). The effects of the groups on daily weight gains in the periods between birth and 6 months were found insignificant ($p = 0.11$). Similarly, the effect of the groups on total gains in body measurements in the periods between weaning and four months were also found insignificant. As a result, the growth performance of the Brown Swiss, weaned with gaining averagely 15.2, 25.9 and 40.3% weight compare to their birth weight, at 35 days age, were found similar.

Key words: Brown Swiss, calf, growth, weaning

INTRODUCTION

The early weaning applications of the dairy calves have been mostly based on the age (Plaza and Fernandez, 1991; Yanar *et al*., 1997; Ugur and Yanar, 1998; Chua *et al*., 2002). In a dairy farms, the applications of the possibilities of the weaning calves at earlier time includes not only weaning age, also the weights of the calves at weaning age criteria (Plaza and Fernandez, 1999; Ugur, 2003). Some studies indicate that the dairy calves can be weaned at 5 weeks old (Yanar and Aydin, 2000; Chua *et al*., 2002; Stanley *et al*., 2002). With this study, it was aimed to form a breeding schedule, suggesting to weaning the calves at 35 days age and at the most suitable live weight.

MATERIALS AND METHODS

This study was carried out in reared at Agriculture Farm of Ataturk University, based on growth records of 26 Brown-Swiss calves. These calves weaned at 35 days age. Then these calves were separated into 3 groups. Calf groups which gained 10-20, 21-29 and 30-50% live weight based on birth weight at weaning time were named as G1, G2 and G3, respectively. Descriptions for the groups are given in Table 1.

Table 1: Descriptions for the groups

Groups	n	Birth weight, kg (BW) $\bar{X} \pm S_{\bar{X}}$	Weaning weight, kg (WW) $\bar{X} \pm S_{\bar{X}}$	Weight gain, % [(WW-BW)/BW]×100 $\bar{X} \pm S_{\bar{X}}$
G1	9	36.8±1.3	42.4±1.7	15.2±1.9[a]
G2	7	35.1±1.7	44.2±2.3	25.9±2.4[b]
G3	10	32.7±1.3	45.9±1.7	40.3±1.9[c]

[a,b,c]: Column values with different superscripts differ ($p<0.05$)

After the calves were born, they were allowed to suckle their dams and received colostrum for the first 3 days. Then, they were fed whole milk by using buckets every morning. In the milk feeding period, the amount of daily milk given to calves was kept constant at 8% of their birth weight. The calves were housed in a building which was specifically constructed for calves and contained individual pens furnished with feeders and milk-water buckets. Two different calf starters (starter 1 and 2) and dried hay were used in this study. Percentages of crude protein, ether extract, crude ash, crude cellulose and dry matter for starter 1 and 2 were: 19.8, 5.4, 4.9, 8.4, 90.0 and

Corresponding Author: Mine Dosay Akbulut, Department of Medical Biology and Genetics, Faculty of Veterinary Medicine, Kocatepe University, Afyonkarahisar, Turkey

18.0, 5.6, 6.7, 9.2, 89.6%, respectively. Starter 1 was fed from birth to 4 months of age and starter 2 thereafter. The quantity of starters was limited as 2 kg day^{-1}. Dried hay in medium quality was offered to the calves *ad lib*. during the study.

In this research, live weights at the birth, weaning, four and 6 months of ages of the calves were determined. Similarly, body measurements (body length, height at withers, chest depth and heart girth) were determined and recorded at birth, weaning, 4 and 6 months of ages. The daily weight gains and total gains in body measurements for different periods were found from the calves live weight and body measurements, determined at birth, weaning, 4 and 6 months age.

In an analysis, the sex was not added into the model as a factor. Because the sex factor do not have a significant effect on daily live weight gain and the total gains of the body measurements in the relevant periods. In the data analysis, the SAS (1996) statistical packet program, based on the completely randomized experimental design method, was used. Duncan multiple comparison test was used to demonstrate the difference between the means of the treatments (Duncan, 1955).

RESULTS AND DISCUSSION

The birth weight and weaning weight average of the calves of the groups are presented in Table 1. The effect of created groups into birth weight ($p = 0.11$) and weaning weight ($p = 0.37$) were found statistically insignificant.

The effect of the groups on growing performance of the calves were presented in Table 2. The daily weight gain between weaning and 4 months of age were 0.58±0.03, 0.52±0.04 and 0.59±0.03 kg for G1, G2 and G3 groups, respectively. The differences among the groups were insignificant. Also, the daily weight gains between birth-6 months and 4-6 months were not affected by the groups. Similarly, total gains in body measurements such as body length, height at withers, chest depth and hearth girth in the relevant periods were also found to be insignificant for the groups (Table 2). In addition to this, the average live weight of the calves in the 4th months old age were found as 91.6±2.8, 87.3±3.7 and 96.0±2.8 kg for the groups, respectively. The effects of the groups, into live weight in the 4th months old age were found statistically insignificant ($p = 0.19$).

In this study, feeds were given into the calves on 7th day after the birth. This application can help to the animals on learning of feed consumption in earlier age. The earlier development of the rumen can be obtained with this application. The result of these, the animals compensate their absents in later days. However, the daily weight gains of calves were lower than standards (Heinrichs and Hargrove, 1994; Guler *et al*., 2006). Low average daily gain of the calves can be due to roughage. The roughage used was not top quality.

Table 2: Least squares means and standard error of means for daily weight gains (kg) and total gains (cm) in body measurements

Trait and period	Groups G1 n = 9 $\bar{X} \pm S_{\bar{X}}$	G2 n = 7 $\bar{X} \pm S_{\bar{X}}$	G3 n = 10 $\bar{X} \pm S_{\bar{X}}$	p-value
Daily weight gains (kg) between:				
Weaning-4 months	0.58±0.03	0.52±0.04	0.59±0.03	0.22
4-6 months	0.42±0.04	0.45±0.06	0.48±0.04	0.62
Birth-6 months	0.44±0.02	0.44±0.03	0.50±0.02	0.11
Total gains in body measurements (cm) between:				
Weaning-4 months:				
Body length	14.0±1.4	11.6±1.7	14.5±1.4	0.44
Height at withers	10.5±1.40	10.6±1.8	11.6±1.4	0.83
Chest depth	8.0±0.9	7.2±0.9	8.5±0.7	0.51
Heart girth	22.0±1.6	19.2±2.0	22.8±1.7	0.38
4-6 months:				
Body length	8.4±1.0	8.5±1.3	7.6±1.0	0.84
Height at withers	7.4±0.9	7.2±1.1	7.5±0.9	0.96
Chest depth	3.5±0.5	4.3±0.6	3.9±0.5	0.54
Heart girth	8.7±1.1	9.5±1.4	10.2±1.2	0.65

The relationship between weaning weight and growth characteristics have been studied by several investigators (Plaza and Fernandez, 1999; Ugur, 2003). Plaza and Fernandez (1999) reported that the effect of weaning weight on growing performance of calves was important. On the other hand, Ugur (2003) found that the performances of calves weaned at different weights were similar. However, in these studies, the effect of weight gains between birth and weaning time on growth characteristics of calves have not been investigated.

CONCLUSION

As a result, the growth performance of the Swiss Brown, weaned at 35 days old age, gaining averagely 15.2, 25.9 and 40.3% weight compare to the birth weight, are found similar to each other.

REFERENCES

Chua, B., E. Coenen, J. Van Delan and D.M. Weary, 2002. Effects of pair versus individual housing on the behavior and performance of dairy calves. J. Dairy Sci., 85: 360-364.

Duncan, D.B., 1955. Multiple range and multiple F-test. Biometrichs, 11: 1-42.

Guler, O., M. Yanar, B. Bayram and J. Metin, 2006. The effect of levels of milk replacer feeding on the performance of Brown Swiss calves raised in Eastern Turkey. J. Anima. Vet. Adv., 5: 373-375.

Heinrichs, A.J. and G.L. Hargrove, 1994. Standards of weight for Ayrshire, Brown Swiss and Milk Shorthorn heifers. J. Dairy Sci., 77: 1676-1681.

Plaza, J. and E. Fernandez, 1991. The effect of the amount of yogurt supplied and weaning age on the performance of female Holstein calves. Cuban J. Agric. Sci., 25: 171-176.

Plaza, J. and E. Fernandez, 1999. Weaning weight and feed consumption on performance of female Holstein calves. Cuban J. Agric. Sci., 33: 37-40.

SAS, 1996. SAS Users Quide: Statistics. Statistical Analysis Systems Institue Inc., Cary, NC.

Stanley, C C, C.C. Williams, B.F. Jenny, J.M. Fernandez, H.G. Bateman, W.A. Nipper, J.C. Lovejoy, D.T. Gantt and G.E. Goodier, 2002. Effects of feeding milk replacer once versus twice daily on glucose metabolism in Holstein and Jersey calves. J. Dairy Sci., 85: 2335-2343.

Ugur, F and M. Yanar, 1998. Effect of the different weaning ages on the growth and feed conversion efficiencies in Holstein-Friesian calves. Indian J. Anim. Sci., 68: 1284-1286.

Ugur, F., 2003. The effect of early weaning at different weaning weights on growth and feed efficiency characteristics of the Brown Swiss and Holstein Friesian calves. Indian J. Anim. Sci., 73: 425-427.

Yanar, M., F. Ugur, N. Tüzemen and R. Aydýn, 1997. Growth performance of Brown Swiss calves reared on two milk feeding schedules. Indian J. Anim. Sci., 67: 1114-1116.

Yanar, M. and R. Aydin, 2000. The effects of weaning age on the growth, milk and milk fat characteristics of Brown Swiss Cattle. Turk. J. Vet. Anim. Sci., 24: 443-446.