

Farmers living in Eastern Turkey mainly earn their incomes from livestock production due to the suitable environmental and climatic conditions in the region. Pastures in this area are abundant and relatively fertile. Also, there are many mountains and high plains which have approximately 1500-2000 meters elevation from sea level. In Eastern Turkey, climatic conditions are generally severe during the winter. Temperatures drop below zero centigrade during the winter and early spring.

On a dairy farm, calf raising is one of the regular jobs that has to be accomplished as economically as possible. In Turkey, milk is more expensive than calf starters when one looks at the price of the dry matter of both feed materials. Dairy farmers in this region spend great amounts of their money in calf raising because the calves are fed excessive amounts of milk for approximately 4-6 months. The calves need to be weaned as early as possible. Some studies in the region have been carried out regarding early weaning of he calves.<sup>2,11,12,13,4</sup> However, additional research on this subject would be necessary to make an accurate assessment of early weaning under the cold climatic conditions of Eastern Turkey.

This study was undertaken to determine and to compare the growth characteristics of Brown Swiss calves weaned at 5 and 8 weeks of age.

## Early weaning of Brown Swiss calves raised in Eastern Turkey

Mete Yanar, Naci Tüzemen, Recep Aydın and Feyzi Ugur

Atatürk Üniversitesi, Ziraat Fakültesi, Zootekni Bölümü, 25240, Erzurum, Turkey

In this study, seventy-one Brown Swiss calves born on the Research Farm of the Agricultural College at Atatürk University, Erzurum, Turkey were used. The calves, 35 male and 36 female, were allocated randomly to the weaning age groups (5 weeks and 8 weeks of age).

After the calves were born, they were allowed to suckle their dams and received colostrum for the first two days.

Then, whole milk was offered to the calves once a day (every morning).

The amount of milk given to the calves was 8% of their birth weight and this amount was kept constant during the milk feeding period.

Calf starter, dry hay in good quality and water were always available in the individual pens.

Two different kinds of the calf starter (starter I and starter II) were utilised in this project. The chemical composition of starter I was 20% crude protein, 5% ether extract, 5% crude ash and 9% crude cellulose.

After the calves reached 4 months of age, starter II was given to the calves. Starter II contained 18.5% crude protein, 4.5% ether extract, 10% crude ash and 11% crude cellulose.

The chemical composition of the dry hay consisted of 7% crude protein, 3% ether extract, 10% crude ash, 27% crude cellulose.

The body weights were determined and recorded at birth, weaning, 4 and 6 months of ages of the calves. The experimental data were statistically analysed by using SAS statistics programme (SAS<sup>6</sup>).

### Results and discussion

The weights of Brown Swiss calves at birth, weaning, 4 and 6 months of age are presented in table 1. The average birth weights of the male and female calves were 36.4 and 34.4 kg respectively. The data concerning birth weight of Brown

Swiss calves are in agreement with other findings.<sup>1,3,4,5,7</sup> Although the male calves were heavier than the female calves, the differences in birth weights of the male and female calves were not statistically significant ( $P>0.05$ ). The birth weights of the calves assigned for different weaning age groups were, also, not found to be significant ( $P>0.05$ ), since the calves used in this research were randomly distributed to these treatments.

The weaning weights of Brown Swiss raised in the east region of Turkey were significantly influenced by the weaning age treatments ( $P<0.01$ ) as expected. Similar results have also been reported.<sup>8,9,10,14,15</sup> In the present study, the average weaning weight of the calves weaned at 5 and 8 weeks of age were 42.4 and 54.5 kg respectively (table 1). However, the weaning weights of calves were not significantly affected by sex ( $P>0.05$ ). The average weaning weights of the male and female calves were 49.8 and 47.1 kg respectively.

The average 4 months of age weights of

calves were not significantly influenced ( $P>0.05$ ) by different weaning age treatments. The findings are in agreement with previous results.<sup>14</sup> The 4 months of age weights of calves in the 5 and 8 weeks of weaning age groups were 84.6 and 81.9 kg respectively. The weights at 4 months were also not significantly influenced by sex ( $P>0.05$ ). The average weights of male and female calves at 4 months of age were 82.8 and 83.7 kg respectively (table 1).

The weaning age treatment did not have any significant effect ( $P>0.05$ ) on the weights at 6 months of age. The result is in accordance with other findings.<sup>8,14</sup> The average 6 months of age weights of the calves weaned at 5 and 8 weeks of age were 106.7 and 112.8 kg respectively.

Average daily and total weight gains of the calves between birth and 6 months of age are presented in table 1. The daily and total weight gains of the calves were not significantly influenced by weaning age ( $P>0.05$ ). The results are in accordance with other findings.<sup>9,10,15</sup> Between birth

Table 1: The Weights, Weight Gains and Milk Consumption of Brown Swiss Calves

	Weaning Ages (Weeks)		S	Sex		S
	5 n = 34 X±S <sub>x</sub>	8 n = 37 X±S <sub>x</sub>		Male n = 35 X±S <sub>x</sub>	Female n = 36 X±S <sub>x</sub>	
Weights (kg) at:						
Birth	34.4±0.77	36.4±0.74	NS	36.4±0.76	34.4±0.75	NS
Weaning	42.4±1.25	54.5±1.20	**	49.8±1.23	47.1±1.22	NS
4 Month	84.6±2.06	81.9±1.97	NS	82.8±2.00	83.7±2.00	NS
6 Month	106.7±2.73	112.8±2.61	NS	109.9±2.69	109.6±2.65	NS
Daily Gains in Weight (kg):						
Birth-6 Month	0.400±0.015	0.424±0.014	NS	0.406±0.015	0.418±0.014	NS
Total Gains in Weight (kg):						
Birth-6 Month	72.0±2.98	74.7±2.85	NS	71.5±2.94	75.3±2.90	NS
Total Milk Consumption (kg)						
	88.6±2.70	154.5±2.59	**	124.1±2.67	118.9±1.63	NS

\*\* :  $P<0.01$

S : Significance

NS : Non-Significant

X±S<sub>x</sub> : Mean ± Standard error of mean

and 6 months of age, the daily weight gains of Brown Swiss calves weaned at 5 and 8 weeks of age were 0.400 and 0.424 kg respectively. In the same time period, total weight gains of the calves fed milk for 5 and 8 weeks were 72.0 and 74.7 kg respectively.

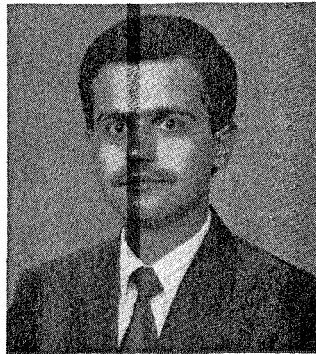
The milk consumption of the calves were significantly affected ( $P < 0.01$ ) by the weaning age treatments as expected. The amount of milk used for the calves during 5 and 8 weeks before weaning were 88.6 and 154.5 kg respectively (table 1).

### Conclusion

The results of this research suggest that it is possible to wean Brown Swiss calves raised in the harsh environmental conditions of the east region of Turkey at 5 weeks of age without any detrimental effect on their growth. However, in this subject, other studies have to be carried out to investigate the possibility of decreasing the weaning age further.

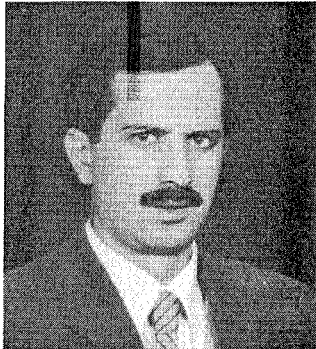
### REFERENCES

1. ARPACIK, R., YOSUNKAYA, H. and ERTURAN, M. (1977): 'Comparison of Growth and Reproductive Characteristics of Karacabey Brown Swiss Calves Fed Different Amounts of Milk', *J. of Lalahan Animal Breeding Institute*, **17**, 3-4, pp 61-82.
2. AYDIN, R., EMSEN, H., YANAR, M. and TÜZEMEN, N. (1994): 'The Effect of Levels of Milk Feeding on the Performance of Brown Swiss Calves Raised in Turkey', *Agric. & E. Intl.*, **46**, 3-4, pp 18-20.
3. CENGİZ, F. (1982): 'Comparison of Performance Characteristics of Holstein Friesian and Brown Swiss Raised in Malya and Koças State Farms', Doctorate Theses. Department of Animal Science, Ankara University, Ankara, pp 45.
4. CENGİZ, F. and İLASLAN, M. (1986): 'The Difference Among Types of Farms in Live Weight, Body Measurements, Daily Weight Gain and Viability at Birth and Six Months of Age in Brown Swiss Cattle Raised in Büyükbogatepe Village of Kars, I, Live Weight', *J. of Agric. College of Ankara University*, **34**, 1-4, pp 166-178.
5. EGBUNIKE, G.N. and TOGUN, V.A. (1981): 'Variations in the Gestation Length and Birth Weight in Bos Taurus and Bos Indicus Females Reared in the Humid Tropics', *Animal Breeding Abstract*, **49**, 2, pp 500.
6. SAS (1986): 'SAS User's Guide, Statistics', SAS Institute Inc., Cary, NY, p118.
7. SÖNMEZ, R., GÖNÜL, T. and KOÇAK, C. (1967): 'Studies on the Brown Swiss and Holstein Friesian Raised in the College of Agriculture at Ege University', *J. of Agricultural College at Ege University*, **4**, 2, pp 19-20.
8. UGARTE, J. (1976): 'Rearing Dairy Calves by Restricted Suckling. 8. Effect of Weaning Age on Milk Production and Calf Performance', *Cuban J. of Agric. Sci.*, **10**, 2, pp 137-143.
9. WINTER, K.A. (1978): 'Response to Weaning at Two and Five Weeks of Age by the Young Dairy Calf', *Canadian J. of Animal Sci.*, **58**, 3, pp 337-383.

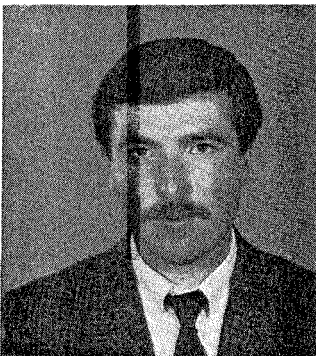


Dr Mete Yanar

Dr Mete Yanar was recently appointed assistant professor in the Department of Animal Science at Atatürk University, Turkey. Dr Naci Tüzemen has been working in the Department of Animal Science as associate professor for 4 years. Mr Recep Aydin and Mr Feyzi Ugur have been studying for their doctorate programme in the same department.



Dr Naci Tüzeman



Mr Recep Aydin



Mr Feyzi Ugur

10. WINTER, K.A. (1985): 'Comparative Performance and Digestibility in Dairy Calves Weaned at Three, Five and Seven Weeks of Age', *Canadian J. of Animal Sci.*, **65**, 2, pp 445-450.
11. YANAR, M., TÜZEMEN, N. and OCKERMAN, H.W. (1993): 'The Effect of Weaning Ages on the Growth Characteristics and Feed Efficiencies of Simmental Calves', *Agric. & E. Intl.*, **45**, 3-4, pp 38-39.
12. YANAR, M. and OCKERMAN, H.W. (1993): 'Milk Feeding Frequency of Brown Swiss Calves in the Cold Semi-arid Climatic Environment of Turkey', *Asian Livestock*, **4**, pp 46-49.
13. YANAR, M., TÜZEMEN, N., AKBULUT, Ö., AYDIN, R. and OCKERMAN, H.W. (1994): 'Growth Characteristics and Feed Efficiencies of Early Weaned Holstein-Friesian, Brown-Swiss, and Simmental Calves Reared in Turkey', *Indian J. of Dairy Sci.*, **47**, 4, pp 273-275.
14. YANAR, M., TÜZEMEN, N. and OCKERMAN, H.W. (1994): 'Comparative Growth Characteristics and Feed Efficiencies in Brown-Swiss Calves Weaned at Five, Seven and Nine Weeks of Age', *Indian J. of Animal Sci.* (Accepted for publication).
15. YUNG, S.G. and CHUNG, C.Y. (1985): 'The Effect of Weaning Time on the Growth and Feed Efficiency in Dairy Calves', *Korean J. of Dairy Sci.*, **7**, 2, pp 49-55.