Short Communication

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Effects of two different environmental conditions on the fattening performance of Brown Swiss bulls

METE YANAR[1], NACI TUZEMEN[2] and LEYLA TURGUT[3]

Atatürk University, 25240, Erzurum, Turkey

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Climatic conditions of the eastern region of Turkey during winter season is usually too harsh, and the temperature sometimes drops under -20 to -30°C. Because of this type of weather conditions, cattle breeders in this region have misconception that the animals must be housed under hot environmental conditions to receive maximum yield. Therefore, all air-inlets and air-outlets are closed tightly in order to raise the temperature in the barn. This practice results in considerable an increase of the relative humidity and temperature in the barn's air. Results of the study carried out in this area during winter revealed that relative humidity values in the 94.1% of the barns was higher than 80% (Okuroðlu 1994). However, the optimum relative humidity value suggested for cattle should not exceed 80% (Esmay 1978). This study was undertaken to investigate the effects of the two different housing conditions on the fattening characteristics of Brown Swiss bulls that were 6-9< months old and 9-12 months old ages.

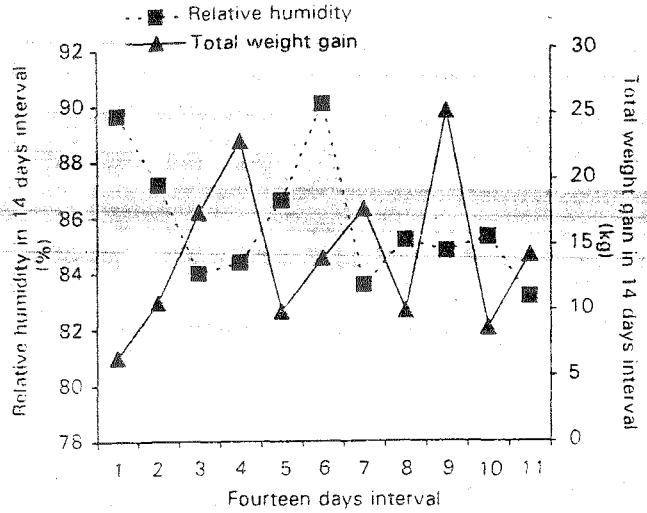
Brown Swiss young bulls (32) were weighed for 3 consequent days before fattening. Then, they were put in 2 stall barns whose average temperatures and relative humidity were 11.9±2.6°C, 77.0±2.0% and 16.0±3.3°C, 85.5±2.8% respectively. Animals were also classified as two age groups according to initial fattening ages, and were fed a ration containing 70% concentrate and 30% dry hay and wet sugar beet pulp. The chemical composition of the concentrate was 88.4% dry matter, 13.8% crude protein, 2.5% ether extract, 4.3% crude ash, 8.5% crude cellulose, 59.2% nitrogen free extract. Dry hay had 91.55% dry matter, 6.4% crude protein, 2.6% ether extract, 8.9% crude ash, 28.8% crude cellulose, 44.6% nitrogen free extract. The wet sugar beet pulp contained 12.6% dry matter, 0.12% crude protein, 1.8% ether extract, 0.55% crude ash, 5.3% crude cellulose, 4.8% nitrogen free extract. Group feeding was applied and automatic waterers during the trial supplied water. Amount of the feed consumed by each group was determined daily. Bulls were weighed individually at 14 days intervals and the fattening lasted for 150 days. Temperature and relative humidity of the barns were recorded continuously by using a thermohygrograph. The differences due to environmental conditions and age treatments were statistically analysed by using 2×2 completely

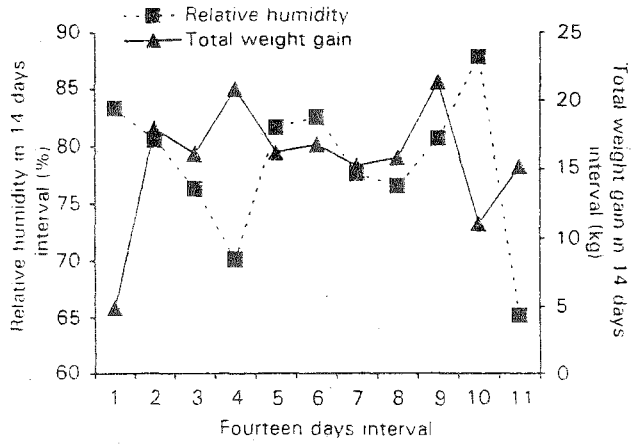
Table 1. Fattening performance of Brown Swiss bulls

	Housing conditions			Initial age of fattening		
	Adequate[1] (N=14)	Inadequate[2] (N=18)	S	6-9<months (N=16)	9-12 months (N=16)	S
Initial weight (kg)	193.8±8.1	202.1±9.2	NS	163.9±8.6	232.0±8.6	**
Final weight (kg)	364.6±10.6	360.8±12.0		324.3±11.3	401.3±11.3	
	(369.1±4.3)[3]	(355.1±4.9)	*	(365.5±5.7)	(358.7±5.7)	NS
Total weight gain (kg)	170.8±4.5	158.7±5.1		160.3±4.8	169.3±4.8	
	(171.7±4.3)	(157.6±4.9)	*	(168.1±5.7)	(161.2±5.7)	NS
Daily weight gain kg	1.11±0.03	1.03±0.03		1.04±0.03	1.12±0.03	
	(1.14±0.02)	1.05±0.03)	*	(1.12±0.03)	(1.07±0.03)	NS

[1]11.9±2.6°C Temperature with 77.0±2.0% relative humidity, [2]16.0±3.3°C temperature with 85.5±2.8% relative humidity; S,significance, NS, nonsignificance; *P<0.05; **P<0.01; [3]the mean values within the parentheses are adjusted for covariate (initial weight).

Present address: [1, 2, 3]Animal Science Department, College of Agriculture, Ataturk Üniversitesi Ziraat Fakültesi, Zootekni Bölümü, 25240, Erzurum, Turkey.





Figs 1-2. 1. Relative humidity and total weight gains of young bulls housed in The inadequate housing condition at 14 days intervals. 2. Relative humidity and total weight gains of animals kept in the adequate housing condition at 14 days intervals.

randomised factorial experimental design. Initial weight was also included to the statistical model as a covariant.

Data with regard to fattening performance of Brown Swiss cattle housed in different environmental conditions are presented in Table 1. Initial weights of the bulls allocated to the different barns were not statistically different. Average daily and total weight gain of the cattle housed under inadequate environmental conditions (high relative humidity and temperature) were significantly ($P<0.05$) lower. The bulls kept in the barn with suitable housing conditions possessed 14.12 kg more weight gain during finishing period (Table 1). The results are in agreement with findings of Borodulin and Kadzhrishvili (1975) , Kamal *et al.* (1989).

The correlation coefficients between relative humidity values and total weight gains obtained 14 days intervals for unsuitable housing conditions revealed that there was negative ($r=-0.50$) but statistically insignificant relationship (Fig. 1). Also, negative relationship ($r=-0.38$) between these parameters for bulls housed in adequate conditions was obtained (Fig. 2).

Age of bulls at the beginning of the fattening had significant influence on the initial weight as expected. However, the age had not significant effect on the total and daily weight gains. Similar results were also reported by Tüzemen (1991).

The average overall feed consumption (as dry matter) per kg weight gain for the bulls kept in the inappropriate housing conditions were 0.630 kg higher than that of cattle housed better environmental conditions. The feed efficiency ratios of cattle fed under inadequate and adequate barns' air were 8.89 and 8.26 respectively. The same values for the 6-9< and 9-12 months age groups were 7.88 and 9.27 respectively.

The results of the study revealed that if relative humidity of the barns was lowered by natural ventilation, young Brown Swiss bulls could have better fattening performance.

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