



Effect of Tethered and Free-Stall Housing Systems on the Fattening Performance of Holstein Friesian Bulls at Two Different Ages

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Abstract

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Fattening performance and feed efficiency ratio characteristics of young Holstein Friesian bulls housed in free-stall or tie-stall barn at two different age groups i.e. 9-12 months and 14-17 months of age were investigated. A total of 19 Holstein bulls were fattened for 142 days. Adjusted average final weights of the young bulls kept in free-stall and stall barn were 395.50 and 404.95 kg, respectively. Average total weight gain of the bulls in loose housing system was 4.7 kg, higher than those in tethered barn. The feed efficiency ratio values for free-stall system was better than tethered barns. The free-stall housing system might be successfully used without causing detrimental effect on the fattening performance of Holstein cattle.

Keywords : Bulls, housing, tethered, free stall, performance.

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Introduction

In the eastern region of Turkey (1200-2000 M above MSL) with distinct geographical and climatic conditions winters are too harsh and it snows a lot. In recent years, Holstein Friesian cattle have been brought to this area to improve milk and beef production. Type of housing and initial age of fattening of the animals, two significant factors influencing profitability of the beef production, are generally neglected in this region.

Conventional tie-stall barn system in the eastern Turkey are commonly used for beef production. The cattle producers in this area have misconception that cattle housed in free-stall can not achieve as fast weight gain during the fattening period as in stall barn since these animals are allowed to move and spend more energy than cattle in the tethered barn. However, the free-stall housing system has many advantages over tie-stall barn, for example, the free-stalls reduce bedding needs and keep cows cleaner (Bates *et al.*, 1985; Yaganoglu *et al.*, 1999). Additionally, Colak (1995) reported that this type of housing systems used in the western Turkey required more labour than free-stall barns.

The present study was undertaken with the objective of evaluating the influence of two different housing systems (free-stall *vs* tie-stall) and initial age of fattening (9-12 *vs* 14-17 M) on the fattening characteristics of Holstein Friesian young bulls.

Materials and Methods

At the beginning of the experiment, the barn containing 20 stalls was divided into 4 parts by iron bars. Two sections of the barn were allocated for the tethered housing system and the rest of the barn was used as free stall barn. Ten bulls (9-12 M) were divided equally in two groups and reared in each section. Similarly of the 9 bulls (14-17 M), 5 were reared in free-stall barn and 4 in tethered barn. These bulls were weighed for two consecutive days before the beginning of the feeding trial. They were fed a mixed ration containing 70 per cent concentrate and 30 per cent dry hay. The chemical composition of the concentrate was 88.8 per cent dry

matter, 15.8 per cent crude protein, 2.5 per cent ether extract, 4.2 per cent crude ash, 9.2 per cent crude cellulose and 57.1 per cent nitrogen free extract. Dry hay had 92.2 per cent dry matter consisting of 6.1 per cent crude protein, 2.4 per cent ether extract, 9.1 per cent crude ash, 30.2 per cent crude cellulose and 44.4 per cent nitrogen free extract.

Group feeding was adopted and water was supplied by automatic waterers during the fattening period of 142 days. Amount of the feed consumed by each group was determined daily and young bulls were weighed individually at 14 days intervals.

The differences due to housing systems and age treatments were statistically analysed by using 2x2 factorial design in Proc SAS GLM statistics program (SAS, 1986). Initial weight was included in the statistical model as a covariant.

Results and Discussion

Initial weights of bulls assigned to the different barns were not statistically different, while the average values for bulls in 9-12 and 14-17 months of ages were significantly different ($P < 0.01$) as expected.

Average daily weight gain of the Holstein bulls was in accordance with the findings of Yanar *et al.* (1990) and Yavuz (1993). Growth rate of cattle kept in the tethered or free-stall barns were not affected by the system of housing (Table 1). The results are in agreement with findings of Hotaman *et al.* (1991) and Videv *et al.* (1993). Also initial age of fattening did not affect daily and total weight gains (Yanar *et al.* 2000).

The average overall feed consumption (as dry matter) per kg weight gain for the bulls housed in free-stall barns was 0.3 kg lower than that of cattle kept in tie-stall barn (Table 1). Since group feeding was applied for animals in loose housing system, the difference between treatment groups could not be analysed statistically. The results were in agreement with findings of Hotaman (1991) and Tüzemen (1995), who indicated that Brown Swiss bulls at 15 months of age in free-stall barn had 1.3 kg better feed efficiency ratio than

Table 1
Fattening performance of bulls fattened in tie-stall and free-stall barns

	N	Initial weight (kg)	Average daily weight gain (kg)	Average daily dry matter consumption (kg)	Feed efficiency
Housing conditions					
Significance		NS	NS		
Tie-stall	10	251.50 ±10.64	1.02±.048 (1.02±.048) ¹	7.65	7.5
Free-stall	9	255.25 ±11.28	1.06±.051 (1.05±.051)	7.63	7.2
Initial age of fattening					
Significance		**	NS		
9-12 M	10	208.30 ±10.64	0.93±0.068 (0.98±0.048)	6.42	6.9
14-17 M	9	298.45 ±11.28	1.15±.075 (1.10±.051)	8.85	7.7

¹The mean values within the parentheses are adjusted for covariate (initial weight).

** = P<0.01; NS = Non-significant.

those in tethered housing system. Similarly, younger animals needed less amount of feed per kg weight gain. Similar findings were also reported by Yavuz (1993).

In conclusion, the loose housing system for fattening young bulls could be suggested for the new cattle barns which may be constructed in this region.

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एल.दुर्गट, एम.यानार, एन.टुजेमन, एस युक्सेल, वी.यागानोग्लु। दो भिन्न आयु के होल्स्टीन-फ्रीजियन नरों के स्थूलीकरण निष्पादन पर खूँटा बंधित और स्वच्छंद घेर विधियों का प्रभाव।

होल्स्टीन-फ्रीजियन के दो आयु वर्ग (9-12 और 14-17 महिने) और दो प्रकार के पालन प्रबन्ध (स्वच्छंद अथवा खूँटा बंधित) में स्थूलीकरण निष्पादन की परख की गयी। कुल 19 नरों को 142 दिन तक खिलाया गया। स्वच्छंद तथा बंधित नरों का समायोजित औसत शरीर भार क्रमशः 404.95 और 395.50 किग्रा था। अर्थात् स्वच्छंद वर्ग का शरीर भार 4.7 किग्रा अधिक था। इसी प्रकार उनमें आहार उपयोग दक्षता भी अधिक थी। अतः स्थूलीकरण निष्पादन को बिना कुप्रभावित किए स्वच्छंद घेर पालन विधि सफलतापूर्वक अपनाई जा सकती है।