

Feedlot Performance and Carcass Characteristics of Western Baggara and Friesian Crossbred Bulls. 1. Slaughtered at 300-kg liveweight.

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SUMMARY

Thirty bulls of an average initial liveweight of 216.5 kg and average initial age of 20.8 months were included in the experiment. They comprised of 15 Western Baggara bulls, which were purchased from local market (Elmoulih) and another 15 Friesian crossbred bulls (Friesian X local Sudan Zebu), purchased from Kuku local market, ■ Khartoum North. The bulls were kept for a period which ranged from 65 to 75 days, during which they were intensively fed on molasses feed (11.09 MJ/kg, ME) and Sorghum straw (6.69 MJ/ kg ME) on *ad libitum* base. Berseem (*Medicago sativa*) forage was given at a rate of two kg/head weekly. Animals were slaughtered at a target liveweight of 300 kg. The Western Baggara bulls were found to be significantly (PL 0.05) greater in the hide weight and the weight of mesenteric fat, kidney fat, reproductive organs and stomach. While the crossbred bulls were found to be superior over Western Baggara bulls in the following studied parameters: feeding period (65 days), feed conversion efficiency (5.58 kg DM/kg liveweight gain) and weight gain (1.36 kg/day).

INTRODUCTION

Sudan is mainly an agricultural country with a large livestock population. Nomads own most of the animals. Traditionally beef production depends on local Zebu cattle fattened for a short period on diets based mainly on sorghum grains and oil seed cakes. Grains sorghum creates a competition between man and animals. Substitution of molasses energy in place of sorghum grains in finishing livestock becomes a necessity. This work was designed to study feedlot

performance and carcass characteristics of Western Baggara and 50% Friesian bulls utilizing agro-industrial by-products mainly molasses in fattening diets.

MATERIALS AND METHODS

A total of 30 bulls of an average initial live weight of 216.5 kg, and average age of 20.8 months were included in the experiment. They comprised of 15 Western Baggara bulls which were purchased from Omdurman Local market (Elmoulih) and another 15 Friesian crossbred bulls (Friesian X Local Sudan Zebu) purchased from Kuku Local market, Khartoum North.

On arrival at Kuku Research Station, they were rested, ear-tagged and each breed was kept in a separate pen provided with watering and feeding facilities. The two breeds were kept for a pre-experimental period of two weeks. At the end of the second week they were individually weighed after an overnight fast, except for water, to give the initial live weight. The initial live weight for the Western Baggara bulls was 216.67 ± 20.93 kg, while that of 50% Friesian bulls

was 216.33 ± 20.94 kg. Each breed was kept separate. In this study one bull from 50% Friesian bulls was slaughtered before the end of the experiment, due to chronic bloat.

The animals were fed on a molasses feed composed of 52% molasses, 39% wheat bran, 5% groundnut cake, 3% urea and 1% common salt (experimental diet) and sorghum straw. During the experiment the molasses feed (Table 1) and sorghum straw were given *ad libitum*. Occasionally green fodder (*Medicago sativa*) was offered at the rate of 2 kg/head/week as a source of vitamin A. The animals were individually weighed at weekly intervals. Weighing was done in the morning before feeding and after an overnight fast except for water. The feed of each group was recorded daily. Animals were slaughtered at a target weight of 300 kg. Animals destined for slaughter were offered water but not food for 14 hours before slaughter. After dressing and eviscerating, the internal organs and offals were removed and weighed. The weight of the body components was recorded. The kidney and kidney knob channel fat were left intact in the carcass. The carcass weight was recorded, and the carcass was chilled at 7 °C for 24 hours. After cooling the cool carcass weight was taken, and then split along the vertebral column into right and left sides. Student t-test was used to analyze all data statistically (Snedecor and Cochran, 1980).

1. ME of concentrate was calculated according to the equation: $ME \text{ (MJ/Kg DM)} = 0.012 \text{ CP} + 0.031 \text{ EE} + 0.005 \text{ CF} + 0.014 \text{ NFE}$.
2. The ME for sorghum straw was 6.69 MJ/Kg DM as stated by Ellis (1981).

RESULTS AND DISCUSSION

Feedlot performance :

As shown in Table 2, the overall live weight gain from the beginning of the experiment to slaughter at 300 kg live weight was not significantly different in Western Baggara bulls (83.3 kg) than in 50% Friesian bulls (83.7 kg). The average daily live weight gain was significantly ($P < 0.05$) higher in 50% Friesian (1.36 kg) than in Western Baggara bulls (1.13 kg). This superiority in live weight gain in 50% Friesian bulls is in agreement with that shown by Olentine *et al.* (1976) who found that crossbreds gained weight

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faster than purebreds. Western Baggara bulls took significantly ($P < 0.05$) longer duration to attain the target slaughter weight than 50% Friesian bulls (Table 2). This could be due to the breed differences in growth rate (Thiessen *et al.*, 1984).

As seen in Table 2, total dry matter intake and total concentrate intake were significantly ($P < 0.001$) higher in Western Baggara than in 50% Friesian bulls. This might be explained by the fact that Western Baggara bulls took longer duration (75.6 days) to attain the target slaughter weight (300 kg) than the 50% Friesian bulls (66 days). The value of feed conversion efficiency of 50% Friesian bulls (5.58 kg DM/kg live weight gain) was significantly ($P < 0.01$) superior than the value (6.49 kg DM/kg live weight gain). This could be explained by the fact that domestic farm animals differ in their growth rate, feed conversation efficiency and carcass composition (Fowler, 1968).

Carcass yield and characteristics of Western Baggara and 50% Friesian bulls :

As seen in Table 3 the cold carcass weight and cold side weight was significantly ($P < 0.05$) superior in 50% Friesian than in Western Baggara bulls.

Table 2 . Performance characteristics of Western Baggara bulls and 50% Friesian bulls.

Item	Mean $\pm$ S.D. Western Baggara	50% Friesian	Significance level
Number of animals	15	15	
Initial live weight (kg)	216.67 $\pm$ 20.93	216.30 $\pm$ 20.93	NS
Final live weight (kg)	300.67 $\pm$ 1.70	300.36 $\pm$ 1.29	NS
Total live weight gain (kg)	83.03 $\pm$ 20.22	83.70 $\pm$ 21.33	NS
Live weight gain (kg/day)	1.13 $\pm$ 0.19	1.36 $\pm$ 0.23	P<0.01
DM intake (kg/head/day)	7.33 $\pm$ 0.10	7.20 $\pm$ 0.02	P<0.001
Concentrate intake (kg/head/ day)	5.15 $\pm$ 0.01	5.03 $\pm$ 0.02	P<0.001
Roughage intake (kg/head/ day)	2.18 $\pm$ 0.14	2.17 $\pm$ 0.16	NS
Total DM intake (kg/head)	538.67 $\pm$ 12.43	467.05 $\pm$ 22.93	P<0.001
Total concentrate intake (kg/head)	367.04 $\pm$ 6.07	324.53 $\pm$ 18.68	P<0.001
Total roughage intake (kg/head)	171.63 $\pm$ 13.03	142.52 $\pm$ 8.33	NS
Feed conversion efficiency (kg DM feed /kg live weight gain)	6.49 $\pm$ 0.84	5.58 $\pm$ 0.11	P<0.01
Time on experiment (days)	75.60 $\pm$ 1.98	65.98 $\pm$ 4.5	P<0.05

Table 3 . Carcass yield and characteristics of Western Baggara and 50% Friesian bulls.

Item S.D. Western Baggara	Mean $\pm$	50% Friesian	Significance level
Number of animals		6	6
Slaughter weight (kg)		299.17 $\pm$ 1.86	300.83 $\pm$ 1.8
Empty body weight(EBW) (kg)		273.92 $\pm$ 4.49	296.50 $\pm$ 1.9
Hot carcass weight (kg)		155.9 $\pm$ 4.27	161.19 $\pm$ 3.5
Cold carcass weight (kg)		151.15 $\pm$ 4.25	157.07 $\pm$ 3.6
Cold carcass side weight (kg)		76.24 $\pm$ 1.83	79.04 $\pm$ 1.75
Chiller shrinkage (%)		3 .05 $\pm$ 0.45	2.56 $\pm$ 0.23
Hot dressing percentage			
(Live weight base, %)		51.97 $\pm$ 1.43	53.51 $\pm$ 1.39
Hot dressing percentage			
(Empty body weight base, %)		56.92 $\pm$ 1.68	58.30 $\pm$ 1.13
Cold dressing percentage			
(Live weight base, %)		50.38 $\pm$ 1.42	52 .36 $\pm$ 1 .2
Cold dressing percentage			
(Empty body weight base, %)		55.19 $\pm$ 0.97	56.81 $\pm$ 1.20
Gut fill percentage (%)		8.03 $\pm$ 0.26	7.30 $\pm$ 0.39

This could be due to the greater gut fill percentage (Table 3) in Western Baggara bulls (8.03%) than in 50% Friesian bulls (7.30%).

The 50% Friesian bulls had significantly ($P<0.05$) superior cold dressing percentage than Western Baggara bulls (Table 3). Differences in dressing percentage could be explained partly by the heavier body components as hide, mesentric fat, kidneys, reproductive organs and alimentary tract of Western Baggara bulls (Table 4). The fact that Western Baggara bulls had heavier gut fill than 50% Friesian bulls could also be responsible for differences in dressing percentage. The value (50.4%) of cold dressing percentage reported in this study was lower than the value (51.2%) reported by El Shafie and McLeroy (1965) for the same breed slaughtered at the same slaughter weight.

Table 4 : Body components of Western Baggara and 50% Friesian Bulls (percent of empty body weight).

Body components	Mean $\pm$ S.D. Western Baggara	50% Friesian	Significance level
Number of animals	6	6	
Head (%)	5.56 $\pm$ 0.28	5.67 $\pm$ 0.21	NS
Hide (%)	8.98 $\pm$ 0.17	7.53 $\pm$ 0.34	P<0.001
Four feet (%)	2.44 $\pm$ 0.18	2.49 $\pm$ 0.20	NS
Stomach weight (full) (%)	10.66 $\pm$ 0.81	9.52 $\pm$ 0.49	P<0.05
Intestine weight (full) (%)	4.35 $\pm$ 0.77	4.07 $\pm$ 0.61	NS
Stomach weight (empty) (%)	3.82 $\pm$ 0.53	3.48 $\pm$ 0.20	NS
Intestine weight (empty) (%)	2.47 $\pm$ 0.29	2.26 $\pm$ 0.28	NS
Mesentric fat (%)	0.65 $\pm$ 0.01	0.56 $\pm$ 0.01	P<0.001
Omental fat (%)	0.90 $\pm$ 0.07	0.91 $\pm$ 0.06	NS
Kidney weight (%)	0.27 $\pm$ 0.02	0.26 $\pm$ 0.02	NS
Kidney fat (%)	1.17 $\pm$ 0.02	0.97 $\pm$ 0.01	P<0.001
Liver (%)	1.53 $\pm$ 0.17	1.66 $\pm$ 0.19	NS
Heart (%)	0.40 $\pm$ 0.04	0.44 $\pm$ 0.04	NS
Reproductive organs (%)	0.96 $\pm$ 0.12	0.76 $\pm$ 0.09	P<0.001
Tail (%)	0.33 $\pm$ 0.03	0.33 $\pm$ 0.03	NS
Lung and trachea (%)	1.40 $\pm$ 0.18	1.54 $\pm$ 0.19	NS
Diaphragm (%)	0.44 $\pm$ 0.04	0.61 $\pm$ 0.19	NS
Spleen (%)	0.35 $\pm$ 0.03	0.35 $\pm$ 0.04	NS
Pancreas (%)	0.06 $\pm$ 0.02	0.09 $\pm$ 0.01	NS

Friesian bulls. This also agreed with findings of Cole *et al.* (1964) that late maturing crossbreds (Brahman X Angus) deposited less fat than early maturing purebreds (Angus). The reproductive organs were significantly (P<0.001) heavier in Western Baggara bulls than in 50% Friesian bulls, which agreed with that reported by Abdalla (1987) for 50% Friesian bulls. This finding might be

due to the differences in the onset of puberty which was possibly earlier in Western Baggara bulls.

The overall results of carcass characteristics of Western Baggara bulls and 50% Friesian bulls in this study indicated that crossbred bulls were superior than purebred bulls, which were in line with those reported by Broadbent *et al.* (1976).

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