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Carcass and non-carcass characteristics of Bunaji (White Fulani) cattle

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Abstract

Offal parts and carcass component data from 40 Bunaji bulls bought from open market and culled from the herds were slaughtered for beef at the meat laboratory of the National Animal Production Research Institute (NAPRI) were used to determine the carcass components and Offal yield of bunaji cattle. Dressing percentages of the cattle ranges between 53.05±1.44 and 51.03±0.23 for the bulls and cows respectively. The differences were not significant (P>0.05). The bulls have significantly (P<0.05) heavier live weight, carcass weight, quantity of beef and hump muscles than cows. On the average the bulls gave 119.03± 3.22kg of beef compared to 110.77± 7.22kg of boneless beef produced by the cows. This value represented about 65.55± 0.51 and 63.8 ± 1.14% of the carcass weight of the bulls and cows respectively. The bulls have significantly (p<0.05) heavier external offal (54.15 ± 1.12kg) than the cows (43.38±2.44kg). These represented about 17.28± 0.23 and 15.28± 0.71% of the live weight of the bulls and cows respectively. The total internal offal (liver, kidney, heart, spleen, lungs, trachea, stomach and intestines) are similar (P< 0.05) between the bulls and cows and represented about 5.25± 0.15 and 6.75± 0.34% of the carcass weight of the bulls and cows respectively. The results of this study show that the White Fulani cattle compared favorably with other African breeds in terms of carcass and non-carcass output. However, a larger proportion of the weight is in the external offal that are nutritionally of low value.

Keywords: Carcass and non-carcass characteristics, Bunaji cattle

Introduction

In Nigeria, meat is the most important supplier of animal protein and beef is the single most important meat to the consumers contributing more than 32% of all meat consumed (FAO,1980). Knowledge of livestock, empty body composition and meat yield is fundamental for professionals engage in meat production or marketing and for investigators studying growth or feeding systems. (Clottey,1972).

By-products of beef industry (beef offal of value) are usually classified into two categories:- edible and inedible. In Nigeria, this distinction is rather difficult to make since many of the so-called inedible by-products are eaten not only because of protein shortage but mainly because of consumers habit. Consequently, hides, intestines, and most of the internal organs and glands of the animals are regarded as delicacies in different part of the country. Bunaji cattle, being the most predominant breed (51% of national herd) in Nigeria was chosen for this study, it has good beef conformation (Olayiwole and Fulani, 1980). However, there is very little information available on the carcass and non-carcass characteristics of this breed, especially those from the Fulani herd. Thus, the present study intends to provide information on carcass and non carcass components of Bunaji cattle bought from the open market and also to compare information so obtained with other African and exotic breeds

Materials and Method

Data used for this study were obtained from 58 Bunaji bulls (40 bulls and 18 cows) bought from the open market Usually the animals were purchased a day or two before slaughter and the slaughtering was carried out at the meat laboratory of the National Animal Production Research Institute (NAPRI), Shika-Zaria, Nigeria. The animals were fasted over night (13-14 hours) to obtain the empty body weight and then slaughtered. The external offal (head, legs, skin and tail) were removed and weighed separately. After evisceration, the internal offal (liver, kidney, heart, lungs and trachea and the spleen) were removed and weighed. The different components of the stomach and intestine were separated and weighed with the content and re-weighed after washing to obtain the empty weight. All the muscles were separated from the animals to form the total boneless meat. The hump muscles were also weighed separately.

All the non-carcass components, the total boneless meat and the hump muscles were expressed as percent of carcass weight and using the randomized block design, the data was subjected to analysis of variance (SAS,1987) using live weight as covariant to correct for differences in live weight. The least square means were compared using Duncan's multiple range tests (Steel and Torrie, 1980).

Results and Discussion

The results obtained on carcass components of the animals showed that the dressing percentages of the animals are in the range of 53.03 ± 1.44 and 51.03±0.23 (mean=52.04) for bulls and cows, respectively. There was no significant difference ($P>0.05$) between the bulls and the cows (table 1.). These values are within the range reported by Olayiwole and Fulani (1980). Okorie *et al.*, (1965) reported 52.6 to 54.1% for N'dama cattle grown on improved pasture. Clottey (1972) reported 45.93% for Ghanaian Lyre-horned Zebu cattle. Boston *et. al.*, (1975) reported a dressing percentage of 50.19%, 48.74% and 46.61% for N'dama steer, bull and cow, respectively. Butterworth and McNitt (1983) reported a dressing percentage of 49.9% for Zebu steer in Malawi.

The bulls gave significantly ($P<0.05$) higher quantity of beef than the cows (Table 1). However, when this was expressed as percentage of carcass weight, there was no significant difference ($P<0.05$) between the bulls and the cows (Table 2). The quantity of beef when expressed as percent of carcass weight is 65.55±0.51 and 63.55±0.25% for the bulls and cows respectively. Clottey (1972) reported 68.73 ± 0.30 and 78.01± 1.31 as percent of muscles when expressed as percent of carcass weight of Ghanaian lyre horned zebu bulls and American Holstein cattle respectively. The main reason for higher beef yield from the bulls is because they are usually bigger than the cows.

Table 1: *Carcass and non- carcass component (kg) of Bunaji cattle*

Component	Bulls	Cows	SED
Shrunk weight	315.62± 9.62	270.50± 20.07	
Empty bodyweight	247.62 ± 4.67	211.68 ± 1.59	2.25**
Carcass weight	168.19± 4.06	155.70± 9.09	5.34***
Dressing Percentage	53.05± 1.44	51.03± 0.23	10.06ns
Boneless meat	119.03± 3.22	110.77± 7.22	10.74***
Hump muscle	6.69± 0.39	3.98± 0.88	1.94***
Head with horn	20.50± 0.39	17.40± 0.86	3.06***
Legs	8.43±0.19	7.25± 0.41	1.09***
Hides	21.53±0.66	17.40± 0.86	2.54***
Tail	3.69±0.11	3.58± 0.25	0.34**
Total external offal	54.15±1.12	43.38± 2.44	6.34***
Heart	1.11±0.03	1.14± 0.07	1.57ns
Spleen	0.91±0.03	0.86± 0.07	0.95ns
Liver	3.85±0.18	3.67± 0.22	1.49ns
Lungs and trachea	3.25±0.18	2.97± 0.08	2.25ns
Stomach	11.04±0.18	10.58± 0.42	2.14ns
Intestine	7.06±0.17	6.72± 0.40	0.02ns
GIT Full	82.00±1.84	76.44± 4.13	4.59**
GIT empty	18.04±0.30	17.62± 0.66	0.64**
Total internal offal	9.61± 0.23	9.41± 0.52	1.34ns

ns=no significant
**= Significant (P<0.05)
***= Significant (P<0.001)

The Bunaji bulls have significantly (P<0.05) bigger hump muscles than the cows (Table 1) .This represent about 3.96±0.39 and 2.56±0.88% of the carcass weight for the bulls and the cows, respectively (Table 2). Harbers *et al.*,(1972) reported a smaller value (2.64± 0.11 kg) for Bunaji X Friesian crosses. This is because Friesian is naturally hump less cattle and when they are crossed with any humped breed, this characteristic tend to manifest

Table 2: *Carcass and offal parts as percent of Live and carcass weight of Bunaji cattle*

	Bulls		Cows	
	Live weight	Carcass weight	Live weight	Carcass weight
Boneless beef	34.77± 2.13	65.55± 0.51	32.43± 2.34	63.55± 0.25
Hump muscle	2.17 ± 1.20	3.96± 0.39	1.47± 0.54	2.56± 0.88
Head with horn	6.50± 0.11	12.19± 0.86	6.55± 0.25	11.18± 0.53
Legs	2.67± 0.05	5.01±0.19	2.72± 0.41	4.66± 0.48
Hides	6.97± 0.20	12.80±0.66	5.75± 0.45	9.73± 0.26
Tail	1.22± 0.04	2.19± 0.09	1.25± 0.09	2.30± 0.11
Total external offal	17.78± 0.32	32.20±1.12	15.28± 0.71	27.86± 0.98
Heart	0.66± 0.01	0.66± 0.23	0.80±0.03	0.73± 0.07
Spleen	0.35± 0.02	0.55± 0.05	0.32±0.03	0.59± 0.05
Liver	1.22± 0.11	2.31± 0.77	1.36± 0.54	2.62 ± 0.17
Lungs and trachea	1.03±0.12	2.29± 0.64	1.10± 0.08	1.19± 1.02
Stomach	3.50± 0.12	6.66± 1.12	3.91±0.12	7.06± 0.27
Intestine	2.27± 0.24	4.20± 0.21	2.48±0.17	4.32± 0.40
GIT Full	25.98±1.74	49.75± 1.20	28.29±1.45	50.56± 2.68
GIT empty	5.72± 1.20	10.95±0.22	6.51± 0.28	11.85± 0.50
Total internal offal	3.04± 0.21	5.75± 0.51	3.78± 0.32	6.75± 0.34

There is significant difference (P>0.05) in the weight of the head, legs, hides, tail and the total external offal between the bulls and cows (Table 1). This is because the bulls are usually heavier than the cow. Butterworth and McNitt (1983) reported a similar value (21.6kg) for hide's weight in Malawi Zebu cattle. However, the value reported by the same authors for head is lower than the value in the present study. This may be due to breed differences. Clottey (1972) gave the proportions of head, hides and tail to live weight in lean Lyre-horn Zebu cattle to be 7.83± 0.02%, 9.38± 0.24% and 0.73±0.02% and the corresponding value for American Holstein cattle to be 2.80±0.08%, 5.53±0.41% and 0.28±0.02% respectively. The value reported for the American Holstein cattle is much lower than what is reported in this study, this may be due to differences in sizes of the two breeds of cattle. The result shows that the American Holstien cattle put less of its weight in the external offal. Butterworth and McNitt (1983) gave the proportions of head and hide to live weight in Malawi Zebu cattle as 3.9 ±0.4 % and 6.5±1.0% respectively. Boston *et al.* (1975) gave.the proportions of the head, hide, tail and feet to empty body weight in N'dama bulls as 5.14±0.48%, 9.94±1.15%, 0.31±0.06 and2.38±0.26% and the corresponding value for the N'dama cow as 5.05±0.22%, 9.39±1.06%, 0.32±0.07% and 2.32±0.28% respectively. There was significant (P<0.05) difference in the total external offal between the bulls (54.15±1.12kg) and cows (43.38±2.44kg). The value represent about 17.28±0.32% and 15.28±0.71% of the live weight for the bulls and cows respectively (Table 2). Ledger and Sayers (1977) reported 15.5% as the total external offal of Boran steer weighing 272kg.

There is no significant difference (P>0.05) in the weight of the heart, liver, kidney, spleen lungs and trachea and the total internal offal of the bulls and cows. However, bulls have significantly (P<0.05) bigger empty stomach than the cows. The weight of liver in white fulani cattle ranges between 3.85 ± 0.18 to 3.67 ± 0.22kg and this represent about 1.22 to 1.36 % of the live weight of the bulls and cows respectively. Butterworth and McNitt (1983) reported the weight of liver in Malawi Zebu cattle to be 3.6kg. Clottey (1972) and Boston *et al.* (1975)

gave the proportions of liver to live weight in Ghanaian lean Lyre horn Zebu cattle and N'dama cattle Sierra Leone to be 1.38±0.26% and 1.48±0.22% respectively.

The gut content is a highly variable factor affecting the dressing percentage of animals and this depend on the extent of fasting before the animal is slaughtered. In this study, the full gastro intestinal tract (Full GIT) represented about 25.98± 1.24 % and 28.26±1.20 % of the live weight of the bulls and cows while the gut content alone represented about 20.28 ± 0.11 and 21.74 ±0.23% of the live weight of the bulls and cows respectively. Boston *et al* (1975) reported the full GIT and gut content of N'dama bulls, steers and cows to represent about 22 to 30 % and 17 to 25% of the shrunk slaughter weight respectively. From this study, it is concluded that Bunaji breed of cattle is a good beef breed with satisfactory beef yield. However, larger proportions of its live weight are accounted for by the external offal that is nutritionally and economically of lower value.

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