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Carcass Measurements and Weights of West African Dwarf Goat as Affected by Dressing Methods

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Abstract

A study on carcass measurements and weights of male West African Dwarf (WAD) goats as affected by dressing methods was carried out. Nine (9) WAD goats weighing between 18-20 kg were allotted to three dressing methods namely: singeing, scalding and skinning; as the treatments, in three (3) replicates. The experimental model was the completely randomized design (CRD). Parameters measured were carcass weights and measurements, primal or wholesale cuts. The results showed that singeing significantly ($p<0.05$) increased intact carcass weight from 5.64 kg and 6.47 kg recorded in the skinned and scalded carcasses to 6.48 Kg, and relative weight from 3.97 kg recorded in both the skinned and scalded carcasses to 4.67 kg. Length of carcass was significantly ($p<0.05$) higher in the scalded carcass (36.67 kg) compared to the skinned and singed carcasses which recorded 30.67 and 28.67 kg, respectively. While, skinning recorded a significant ($p<0.05$) higher weight for depth of chest and maximum width of leg, having 17.67 and 13.67 cm compared to singeing and scalding having 16.67cm each for depth of chest, 11.67 and 10.67 cm, respectively for maximum width of leg. Also, primal cuts yields of rack, neck, shoulder and shank were significantly ($p<0.05$) higher in singeing, while those of loin and leg were significantly ($p<0.05$) higher in skinning. Scalding recorded the least yields in all the primal cuts measured.

Key words: Singeing, scalding, skinning, carcass measurements, weights.

Introduction

The WAD goat is the commonest and most important indigenous breed of goat in West and Central Africa (Omoruyi *et al.*, 1991), with important attributes such as: excellent adaptation to its native habitat, high fertility and prolificacy, resistance to trypanosomiasis and gastrointestinal nematodes (Porter and Mason, 2002). These attributes have established the goat meat as a lean meat with favourable nutritional qualities; low in calories, total fat, saturated fat and lesser cholesterol, accounting for approximately 63% of all red meat consumed worldwide (Lewandoski, 2003). In assessing the carcass characteristics of the WAD goat, different methods could be employed.

Paramount among them is the dressing or dehairing method employed for animal carcasses, known to affect its carcass characteristics, which include; singeing, scalding and skinning (Omojola and Adesehinwa, 2006). Singeing is a method employed to burn off the hair of an animal, given the carcass skin a golden brown colour and an enhanced smoky flavour on the processed meat (Okubanjo, 1997). Scalding is a method of floating carcass or dipping of well bled animal in hot water to loosen the skin follicles in order to ease its removal (Monin *et al.*, 1995). While, skinning or convectional dressing according to Awosanya and Okubanjo (1993), is a simple act of pulling the subcutaneous skin, thereby removing some subcutaneous fat and exposing the internal carcass body. These dressing or dehairing methods will not only affect the temperature and ultimate pH of carcass and its rate of decline but will also affect other carcass characteristics.

Several authors have reported on carcass characteristics subjected to these different dressing methods. Monin *et al.*, (1995) reported on effects of dehairing pigs by scalding or singeing, where carcass weights and yields were noticeably higher after singeing than after scalding. Okubanjo (1997) observed similar results for the chevon carcasses where dehairing by singeing resulted in markedly heavier carcass than after convectional dressing with lesser carcass weights. An increase in the percentage yield of leg in singed carcass and a decrease in loin, breast, shank and flank (BSF) was also reported by Okubanjo (1997), when compared with those of the conventionally dressed carcasses. These dressing methods although have been applied to different livestock, but information on the WAD goat is scarce. This study therefore seeks to provide information on carcass measurements and weights of WAD goats (buck) as affected by dressing methods.

Materials and Methods

Nine (9) male WAD goats of between 18-20kg live weight were purchased from the open market in Ekpoma and transported to the Livestock Unit of the Teaching and Research Farm, Animal Science Department, Ambrose Alli University, Ekpoma. They were fasted for 16 hours but had access to clean water. The animals were slaughtered in batches of three (3), randomly allotted to each of the three dressing methods namely: singeing, scalding and skinning, with each representing a treatment. *Singeing* – In this method, the hairs of goat were flamed off and scrapped using a metal scrapper on the fire, following the procedures of Okubanjo (1997). *Scalding* – Here, the bled goats were dipped in hot water of 85°C for 30 seconds, after which the hairs were scrapped off with mental scrapper and knife, as described by Monin *et al.*, (1995). *Skinning*- In skinning, a ring was made round one of the hind legs with a scalpel, which was inserted under the skin of the leg, to open it up to the root of the tail. The same was repeated with the other leg. While from the pelvic region, another incision was made up to the neck region. The hair was then pulled along the skin, thereby exposing the internal carcass, according to the procedures of Omojola and Adesehinwa, (2006). Evaluation and measurements of carcass were carried out as follows; (i) carcass weights and measurements: which include intact carcass weight, eviscerated and relative carcass weights, as well as length of carcass, depth of chest, length of leg and maximum width of leg, were measured using a table scale and meter rule. (ii) Primal or wholesale cuts: which include breast, back, neck, flank, loin, leg, shoulder and shank, were weighed with the aid of a scale.

The design for the experiment was the completely randomized design, one way analysis of variance. Results from the experiment were analyzed using Analysis of Variance, and means that showed significance were separated appropriately by the procedure of Statistical Analysis System (SAS, 2010).

Results and Discussion

The results of the mean values of carcass weights and measurements as influenced by dressing methods presented in Table (1), showed that singeing significantly ($p<0.05$) increased the intact carcass weight to 6.84 Kg, as against skinning which weighed 5.64 Kg, and scalding having 6.47 Kg, though not significantly ($P>0.05$) from singeing. This was as a result of the dressing methods applied, as heat tends to swell or increase carcass weight, while skinning reduces it. Eviscerated weight was not influenced by the dressing methods, though singeing recorded a higher value of 3.84 Kg compared to scalding and skinning with 3.67 and 3.64 Kg respectively. Relative weight of carcass was significantly ($p<0.05$) influenced by dressing methods, with singeing recording a higher weight of 4.69 Kg compared to scalding and skinning having 3.97 Kg both. This was as a result of the intact carcass weight which was initially higher in singeing. Length of carcass was influenced by dressing method applied, with a higher significant ($p<0.05$) value of 36.67 cm recorded for scalding as against singeing and skinning which had 28.67 and 30.67 cm respectively. This was attributed to the dressing method applied, since carcass when subjected to hot water increases in size. This result contradicts the findings of Okoh *et al.* (2016), where skinning significantly ($p<0.05$) increased the carcass length of Red Sokoto goat compared to singeing and scalding.

Table 1: Mean values of carcass weights and measurements as affected by dressing methods

Parameters	Scalding	Singeing	Skinning
Intact carcass weight (kg)	6.47 ^a	6.48 ^a	5.64 ^b
Eviscerated weight (kg)	3.67	3.84	3.64
Relative weight (Kg)	3.97 ^b	4.69 ^a	3.97 ^b
Length of carcass (cm)	36.67 ^a	28.67 ^c	30.67 ^b
Length of leg (cm)	20.67	19.67	20.67
Depth of chest (cm)	16.67 ^b	16.67 ^b	17.67 ^a
Maximum width of leg (cm)	10.67 ^c	11.67 ^b	13.67 ^a

a,b,c Means of similar superscripts along rows are not significantly ($p>0.05$) different

Length of leg was not affected ($p>0.05$) by the dressing methods applied, though scalding and skinning recorded higher values of 20.67 cm each, while singeing had 19.67 cm. Depth of chest showed a significant ($p<0.05$) difference among the dressing methods applied, with skinning having a higher value of 17.67cm, as against scalding and singeing which had 16.67 cm each. The higher significance ($p<0.05$) recorded by the skinning method could be

attributable to differences in the sizes of the carcass measured which could be higher in the skinned carcass. This result contradicts the report of Okoh *et al.*, (2016), where scalding significantly ($p < 0.05$) increased the depth of chest of Red Sokoto goat, as against singeing and skinning, which was attributed to the added weight and protective effects of the skin which was retained on the carcass as a result of the dressing method applied. Maximum width of leg was significantly ($p < 0.05$) influenced by dressing methods applied, with skinning having higher value of 13.67 cm, compared with scalding and singeing which had 10.67 and 11.67 cm, respectively. This result was expected as result on length of leg was initially higher in the skinned carcass.

The results of primal or wholesale cuts in Table (2) showed that singeing significantly ($p < 0.05$) elevated the yields of almost all the cuts measured, though not significantly ($p > 0.05$) different from skinning for the breast carcass, with both having a weight of 0.30 Kg. It also increased significantly ($p < 0.05$) the weights of rack and neck, having 0.35 and 0.40 Kg, compared to skinning and scalding, which had 0.30 Kg each, as well as 0.25 and 0.20 Kg for rack and neck respectively. Weight of flank was not significantly ($p > 0.05$) different between singeing and skinning, with both having 0.20 Kg, but significantly different ($p < 0.05$) from scalding which had 0.15 Kg. The higher weight in flank recorded in this study for the skinned carcass is in line with the findings of Okubanjo (1997), where yields of breast, shank and flank (BSF) significantly decreased ($p < 0.05$) in singed carcass when compared with those of the conventionally skinned carcass

Table 2: Mean values of primal cuts as affected by dressing methods

Parameters (Kg)	Scalding	Singeing	Skinning
Breast	0.20 ^b	0.30 ^a	0.30 ^a
Rack	0.25 ^c	0.35 ^a	0.30 ^b
Neck	0.20 ^c	0.40 ^a	0.30 ^b
Flank	0.15 ^b	0.20 ^a	0.20 ^a
Loin	0.20 ^c	0.25 ^b	0.30 ^a
Leg	0.35 ^c	0.70 ^b	0.80 ^a
Shoulder	0.40 ^c	0.50 ^a	0.45 ^b
Shank	0.40 ^b	0.50 ^a	0.50 ^a

a,b,c Means of similar superscripts along rows are not significantly ($p > 0.05$) different

Skinner imposed significantly ($p < 0.05$) higher weights for loin and leg, having 0.30 and 0.80 Kg, compared with singeing and scalding which had 0.25 and 0.70 Kg; 0.20 and 0.35 Kg for loin and leg respectively. This result is in agreement with report of Okubanjo (1997), that yield of loin was significantly ($p < 0.05$) higher in conventionally skinned carcass, but disagreed that the percent yield of leg significantly ($p < 0.05$) increased in the singed carcass. Yield of shoulder was significantly ($p < 0.05$) higher in singeing, having 0.50 Kg compared with skinning and scalding which had 0.45 and 0.40 Kg respectively. While, the weight of shank did not differ significantly ($p > 0.05$) between singeing and skinning, with both having 0.50 Kg each but differs significantly ($p < 0.05$) from scalding which had 0.40 Kg. The high weight recorded in shank in this study for the skinned carcass is in line with the findings of Okubanjo, (1997). A significantly ($p < 0.05$) higher and lower weights recorded for leg and flank respectively among other primal cuts in this study, were also observed by Attah (1997) for the Red Sokoto and West African Dwarf goats, and Okoh, (2006) for the Red Sokoto goats. Differences in weights of these primal or wholesale cuts can be attributed to differences in sizes and shapes of the meat parts

Conclusion

Based on the findings from this study, singeing dressing method imposed higher weights in most of the parameters measured like intact carcass weight, relative weight of carcass, rack, neck, shoulder and shank. Scalding increased the length of carcass but did not impose any influence on yields of wholesale cuts. While skinning elevated the depth of chest, maximum width of leg, flank, loin and leg of carcass. It is therefore recommended that singeing dressing method be adopted by meat processors and home consumers, as it recorded better results among other dressing methods.

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