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A NOTE ON THE CARCASS COMPOSITION OF THE COMMON ELAND *(TAUROTRAGUS ORYX)*

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The eland as the largest of the antelopes indigenous to Africa is also the most docile. For these two reasons attention has for more than a century been focussed on the possibility of using it as a farm animal (Skinner, 1967). Of the different aspects of eland production one that has received little attention in the literature is carcass yield and composition. The object of this note is to present carcass data on eland bulls kept under free range conditions without supplementary feeding and from castrated eland bulls fed in metabolism studies.

Six bulls, varying in age from three to ten years, were randomly selected at the S.A. Lombard Nature Reserve in the Western Transvaal Highveld and one animal shot every two months. They were shot in the veld from close range through the head and bled immediately, whereafter the carcass was weighed and dressed at the laboratory. Dressing percentage was calculated on the live weight, taken as that after shooting and bleeding, and the cold carcass weight at 0700 hr the following morning. Weights were recorded for skin, trotters, full viscera, kidneys, kidney fat, and heads including tongue and horns. The carcasses were split medially and the left side measured to obtain length of carcass and length and circumferences of buttock whereas surface area of the eye muscle *(M. longissimus dorsi)* was traced between the last thoracic and first lumbar vertebra. The right side was weighed and subsequently split up into neck, shoulder, brisket, flat rib, chuck, prime rib, wing rib, loin, thin flank, rump and buttock. The buttock was again dissected into fat, muscle and bone + sinews.

Three eland castrated at four months of age and about three years old when slaughtered at the Onderstepoort abattoir after stunning with a captive bolt pistol were available. For four months prior to slaughter they had been fed *ad lib.* on a ration consisting of three parts concentrate and one part milled hay and containing 11,5% digestible protein and 75% total digestible nutrients. Previously these animals had been used in metabolism studies at the University of Pretoria. Dressing percentage was calculated on cold carcass weight after 24 hrs cooling at 4°C and liveweight obtained after 12 hrs fasting. Weights of head, skin, trotters and full viscera were recorded. On one hindquarter of the medially split carcass the percentage yield of loin, wing rib, rump, topside, silverside, thick flank and thin flank was determined. The 9–10–11th rib was dissected according to the technique of Hankins & Howe (1946) to obtain the percentage dissectible muscle, fat and bone + sinews. To determine the percentage of intramuscular fat the Gerber fat test was applied on a *M. longissimus dorsi* sample. Meat tenderness was measured with the aid of the Warner-Bratzler shear tester.

The liveweights of the bulls in Table 1 were heavier than those recorded in Zambia (Robinette, 1963 : 3 bulls) but lighter than those recorded in Rhodesia (Posselt, 1963: 1 bull) Malawi and Tanzania (Meinertzhagen, 1938: 4 bulls; Lamprey, 1964: 1 bull), where the average weights varied from 720 to 840 kg. In Russia the mean weight of 10 mature bulls was 700 kg (Skinner, 1966). Nutritional level will undoubtedly influence growth rate and mature size and may well have been a major factor in determining the size of the bulls in the present study. On the other hand, the largest impala recorded in Southern Africa have been shot on the S.A. Lombard Reserve (Skinner, 1971) and as they feed on a similar range of plants and shrubs, genetical factors may be chiefly responsible in this instance.

The castrated eland were fed from four months of age and nutrition was not a factor limiting their growth. Nevertheless they did not grow as big as a castrated eland recorded in Rhodesia (Posselt, 1963) which weighed 450 kg at 3 years and 727,3 kg at 6 years off veld. The other example of a castrated eland was one at the S.A. Lombard Nature Reserve (van Zyl, 1962) which weighed 446,8 kg at 8,5 years of age and had been fed for one month prior to slaughter.

Although they had virtually the same live weights, the carcass data in Table 1 reveal considerably higher dressing percentages for the castrated eland than for the bulls. This was mainly due to the difference in fill (see % live weight constituted by full viscera) which was caused by the fasting of the castrated animals prior to weighing and which resulted in relatively lower corresponding live weights. Furthermore, it seems as if the carcasses of the castrated animals contained more fat, although the results can not be directly compared because the buttocks of the bulls were dissected compared to the 9–10–11th rib of the castrated eland.

The high yield of 80,0% muscle given for bulls in Table 1 agrees well with similar results quoted by Ledger,

Table 1

Carcass data on eland bulls shot at a Nature Reserve and three castrated eland bulls slaughtered at an abattoir.

	Eland Bulls*		Castrated Eland *	
	Mean	Range	Mean	Range
As % of live weight				
Dressed carcass	51,3	47,9 – 53,5	63,2	61,7 – 65,2
Head	4,1	3,9 – 4,6	3,4	3,2 – 3,6
Skin	6,6	5,4 – 8,3	6,5	6,0 – 7,1
Trotters	2,2	1,7 – 2,8	2,0	1,9 – 2,2
Full viscera	28,9	26,2 – 34,5	14,9	12,9 – 16,7
Weights (kg)				
Live weight	408,5	294,4 – 496,0	412,7	379,1 – 478,2
Cold carcass	209,7	141,2 – 257,1	261,3	234,9 – 311,7
Kidneys	0,9	0,6 – 1,4	–	–
Kidney fat	0,85	0,1 – 1,8	–	–
As % of right carcass side				
Neck	13,1	11,2 – 15,5	–	–
Shoulder	18,1	17,6 – 18,8	–	–
Flat rib	5,0	4,3 – 6,4	–	–
Brisket	9,5	8,5 – 10,8	–	–
Chuck	7,2	6,5 – 8,6	–	–
Prime rib	4,3	3,9 – 4,9	–	–
Wing rib	2,2	2,0 – 2,5	2,5	2,4 – 2,6
Loin	6,3	6,0 – 6,7	5,9	5,8 – 6,0
Thin flank	2,7	2,5 – 3,1	6,3	5,6 – 7,8
Thick flank	–	–	4,8	4,6 – 5,2
Rump	6,5	5,3 – 7,8	7,5	7,3 – 8,3
Buttock	24,9	22,3 – 27,5	–	–
Topside	–	–	8,2	7,2 – 8,9
Silverside	–	–	7,3	6,7 – 7,7
As %of buttock				
Muscle	80,0	79,3 – 81,3	–	–
Fat	2,4	1,0 – 3,9	–	–
Bone + Sinews	17,4	16,4 – 18,5	–	–
Dissection of 3-rib-cut				
Muscle %	–	–	71,8	66,6 – 75,7
Fat %	–	–	12,1	7,7 – 17,8
Bone + sinews %	–	–	15,3	14,5 – 15,6
Gerber fat test %	–	–	2,1	1,8 – 2,5
Warner-Bratzler index	–	–	24,0	20,5 – 30,4
Carcass measurements (cm)				
Length of carcass	131,7	121,6 – 140,5	129,1	128,0 – 131,0
Length of buttock	78,3	64,4 – 88,1	–	–
Circumference of buttock	101,9	89,3 – 114,0	–	–
Area of eye muscle (cm^2)	66,6	57,9 – 80,4	74,0	67,4 – 85,8

* The eland bulls and castrated eland were dissected by different teams at different times and are not directly comparable.

Sachs & Smith (1967) for 17 wild ungulate species. It is, however, interesting to note that the extremely low fat content could be raised by castrating the males and feeding them well and thus enhancing their carcass quality. The carcasses of the castrated eland seem to have been better finished as is indicated by their larger eye muscle surfaces, whereas the mean carcass length did not vary considerably from that of the entire bulls. Furthermore, the percentage carcass weight made up by wing rib,loin and rump did not differ much between the two groups but the late developing thin flank, the weight of which is to a large extent influenced by fat deposition, was considerably heavier in the case of the castrated animals.

Table 2

Seasonal effect on body composition

Date shot	May	July	Sept.	Nov.	Jan.	March	Mean
Live weight (kg)	496,0	487,8	294,4	320,0	368,0	484,8	408,5
Dressing percentage	51,1	49,5	47,9	53,5	52,7	53,0	51,3
Kidney fat (kg)	1,8	1,0	0,1	0,2	0,3	1,7	0,85
%Fat in buttock	3,9	2,2	2,1	1,0	2,7	2,5	2,4

A B

Plate I

Cross-section of the longissimus dorsi *at the 9th rib in A an eland and B a bovine carcass from animals "finished" for the same length of time. Note the larger amount of fat around the muscle in the bovine.*

Ruminants on the Highveld are subject to severe winter nutritional depressions as the dry grass has a low feeding value and edible bush and shrubs are not plentiful Although the numbers were limited and the bulls shot at S.A. Lombard varied in age, the data in Table 2 indicate that the condition of the eland was at its lowest in early spring. This confirms similar data on springbok and impala at the same Nature Reserve (von La Chevallerie & van Zyl, unpublished).

The mean Warner-Bratzler index of 24 recorded for the castrated eland was somewhat higher than the index of 16 obtained for five comparable bovine steers slaughtered at the same time and after a similar finishing period. The thicker subcutaneous fat cover and indications of better marbling in the loin of bovine steers compared to that of castrated eland is illustrated in Plate I.

Conclusions

The two groups of eland slaughtered in this study embraced too few animals to permit definite conclusions. This again emphasises the paucity of our knowledge regarding meat production from antelope and the effects of different treatments on carcass characteristics. Nevertheless, farming with this species seems practically feasible as they could conceivably be loaded into trucks and transported to an abattoir, although they can become aggressive when transported under confined conditions (Davison, 1966). There is a definite need for more information on their productivity off veld when alone or with cattle and small stock, effect of castration and dehorning, feedlot performance, and carcass quality. Special attention should also be given to the optimum age for marketing as it has been indicated that wild ungulates in contrast to domestic animals continue to increase in percentage of carcass lean up to maturity (von La Chevallerie & van Zyl, 1971). Of all the antelope species, the eland is the one that recommends itself for controlled venison production which could be a lucrative source of income if directed at the growing tourist industry.

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