Meat studies of indigenous Southern African cattle. I. Growth performance and carcass characteristics of Afrikaner, Nguni and Pedi bulls fed intensively

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Afrikaner, Nguni and Pedi weaner bulls (15 per breed) were fed individually from initial masses of 168, 159 and 160 kg to predetermined target masses of 290, 340 and 390 kg respectively. Feed and water were freely available. The diet consisted of the standard concentrate fed to bulls participating in Phase C of the performance test, supplemented with 0,4 kg *Eragrostis curvula* hay per day. Analyses of variance and least-significant differences between means indicated no breed differences in either average daily gain or feed conversion ratio over the growth intervals, although a breed effect on the number of days fed was found to be significant ($P < 0,05$). The Nguni was found to have the heavier carcass ($P < 0,05$), greater dressing percentage ($P < 0,05$), the more compact carcass ($P < 0,05$) and hind quarter ($P < 0,01$), and a lighter hide (%) ($P < 0,05$). Minor breed effects were found in the content of carcass bone, muscle, fat and total meat. These differences were insufficient to influence the grading scores, in which no differences were recorded.

Afrikaner-, Nguni- en Pedi-speenbulle (15 per ras) is onderskeidelik vanaf aanvangsmassas van 168, 159 en 160 kg individueel tot teikenmassas van 290, 340 en 390 kg gevoer. Voer en water was vrylik beskikbaar. Die dieet het bestaan uit die standaardrantsoen vir Fase C-prestasietoetsing, gesupplementeer met 0,4 kg *Eragrostis curvula*-hooi per dag. Variansie-analises en kleinste betekenisvolle verskille tussen gemiddeldes het geen betekenisvolle verskille tussen rasse getoon in gemiddelde daaglikse toename en voeromsettingsverhouding oor die groeiperiodes nie, maar wel 'n verskil ($P < 0,05$) in die getal dae gevoer. Die Nguni het 'n swaarder karkas ($P < 0,05$), hoër uitslagpersentasie ($P < 0,05$), 'n meer kompakte karkas ($P < 0,05$) en agterkwart ($P < 0,01$), en 'n ligter huid (%) ($P < 0,05$) getoon. Geringe rasverskille het in die been-, spier-, vet- en totale vleisinhoud van die karkas voorgekom. Hierdie verskille het geen invloed op die gradering gehad nie.

Keywords: Bulls, carcass, feedlot, growth.

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The Afrikaner and Nguni represent two indigenous cattle breeds of Southern Africa, with the Pedi described as a related breed or variant of the Nguni breed (Maule, 1973). These breeds are all classified under the Sanga group of cattle, which describes all indigenous breeds in Africa descended from the same ancestors (Brown, 1959). Although the Afrikaner, Nguni and Pedi are phenotypically slightly different, their genotypic relationship is still being investigated under the project 'Gene Mapping of South African Cattle Breeds' (Department of Agricultural Development). No reliable statistics exist for the numbers and distribution of the different breeds, but changes have occurred during the last two decades. Disease, drought and the introduction of various *Bos taurus* and *B. indicus* breeds have resulted in a dramatic decrease in numbers of pure indigenous cattle (Hofmeyr, 1987). Presently, commercial beef producers are showing renewed interest in the indigenous breeds, especially the Nguni, owing to favourable reproductive characteristics. The growth efficiency and lean carcass of bulls have been recognized and beef production from intact bulls is being encouraged. Carcasses of the young bulls in which permanent teeth have not yet erupted, irrespective of secondary sexual development, are evaluated in the same categories as those of steers and may achieve the highest grades, according to regulations promulgated under the Marketing Act (Act 59 of 1968).

Sanga bulls from the Caprivi, as well as Nguni and Pedi bulls are reported to grow between 890 and 1 100 g/d, with a feed conversion ratio of between 7 and 8, when fed intensively to 350 kg live mass (yielding a 200 kg carcass). At this live mass, carcasses may contain sufficient fat with a favourable carcass conformation, thereby achieving the best grades (Naudé, Venter, Nel, Botha & Stiemie, 1979). Intensively fed Nguni and Sanga (Caprivi) bulls reportedly have growth rates more than 15% higher than steers of the same breed (Naudé, Armstrong & Klingbiel, 1977), similar to the standard difference in growth rate between bulls and steers of European breeds. This study was undertaken firstly to establish the relative growth performance of Afrikaner, Nguni and Pedi bulls under intensive conditions, and to compare their carcass and meat characteristics. Secondly, we wished to determine the feasibility of feeding indigenous bulls intensively for meat production purposes. This paper deals with the growth and carcass characteristics only.

Procedure

Afrikaner, Nguni and Pedi weaner bulls (20 per breed) were allocated randomly to four target slaughter masses. An initial

group of five from each breed was slaughtered (Table 1) and the remaining 15 were fed intensively to predetermined target masses of 290, 340 and 390 kg. During a 21-day adaptation period, the bulls were freely given *Eragrostis curvula* hay while gradually being introduced to the standard concentrate ration fed during Phase C of the bull performance testing scheme (Beef Cattle Performance Testing Scheme). During the trial, water and concentrate which was supplemented with 0,4 kg *E. curvula* hay per day as a precautionary measure against digestive disturbances, were freely available. The animals were weighed after being withheld from water overnight, while feed intakes were recorded weekly on a dry-matter basis. Average daily gains (ADG) and feed conversion ratios (FCR) between target masses were analysed using a standard analysis of variance technique.

Prior to slaughtering, feed and water were withheld for 16 h, after which the 'starved' body mass was measured. Following stunning by captive bolt and severing of the jugular vein, carcasses were stimulated electrically (500 V, 12,5 Hz for 2 min, polarity changes per 30 s) to prevent cold shortening during chilling. The carcasses were halved carefully, the warm carcass mass was recorded, chilled (4°C, RH 60%) for 19 h and cold carcass mass was recorded. Other masses measured were those of the hides and all offal components (head with tongue; feet; full and empty stomach and intestine; oesophagus, trachea, lungs and heart; liver with gall bladder; omental fat; spleen). True empty body mass, calculated by subtracting intestinal contents from the starved body mass, was used to calculate dressing percentage by expressing warm carcass mass as a percentage of empty body mass. Carcass lengths were measured from the middle of the anterior edge of the first rib and the centre of the pubic process. Carcass compactness was calculated as a ratio of carcass mass per length. The length of the hind quarter was measured between the centre of the pubic processus and the most distal plane of the tibia. The ratio of mass per length represents compactness of the buttock.

The kidneys, kidney and channel fat of the right sides were removed and the sides quartered between the 10th and 11th ribs, with a straight cut through the spinal column. A mean subcutaneous fat thickness was calculated from measurements taken on the caudal surface of the prime rib opposite the widest point of the *M. longissimus thoracis* and at 2,5 cm from the medial plane. The prime rib (8, 9 and 10th ribcut) was removed for detailed analyses from which composition of the side was calculated (Naudé, 1972). The left halves were graded according to official standards, according to regulations promulgated under the Marketing Act (Act 59 of 1968). For the purpose of statistical analyses, grades were allocated the following values: Super A, 4; A1, 3; A2, 2; A3, 1.

The results were analysed statistically in one- or two-way analyses of variance. Breed differences were identified in *F* tests. Least significant differences between means highlighted individual breed differences. Significances are quoted at the $P < 0,01$, $P < 0,05$ and $P < 0,10$ levels.

Results and Discussion

The bulls had been randomly selected on corrected 210-day weaning masses (Table 1), with no significant differences occurring between the breeds. All three breeds lost weight during the post-weaning period owing to post-weaning shock, transport and changes in the environment. These factors probably accounted for the differences in initial mass. Although the Afrikaner had the lowest average age, ages did not differ significantly over the entire mass range and consequently were not corrected for. Average daily gains (Table 2) over the three growth periods did not differ between breeds. The decrease in average daily gain with advancing growth occurred as expected. Feed conversion

Table 1 One-way analysis of variance of weaning mass, initial mass and slaughter age

		Mean and SD				*F* value	Least significant difference		
Parameter	Group	Afrikaner	Nguni	Pedi	CV %	(Breed)	A : N	A : P	N : P
Weaning mass (kg)									
(210 days)		180,00	175,58	179,50	7,25	0,68	NS	NS	NS
		10,56	7,34	18,20					
Initial mass (kg)		167,87	158,60	159,80	5,89	4,18	**	*	NS
		8,65	10,48	9,41		**			
Slaughter age									
(days)	Initial	261,40	299,00	274,20					
		16,17	7,18	16,80					
	290 kg	364,80	405,40	394,40					
		9,88	24,14	4,22					
	340 kg	410,20	448,40	452,40					
		17,82	31,71	24,89					
	390 kg	482,80	507,00	519,20					
		31,44	45,62	36,13					
	$\bar{x}$	379,80	414,95	410,05	21,80	0,95	NS	NS	NS

** $P < 0,05$; * $P < 0,10$; NS – not significant.

Table 2 Two-way analysis of variance of slaughter mass, empty body mass (EBM), days fed, average daily gain (ADG) over growth intervals (g/d), and feed conversion ratio (FCR) over growth intervals

		Mean and SD				*F* value			Least significant difference		
Parameter	Group	Afrikaner	Nguni	Pedi	CV %	Breed	Mass	B × M	A : N	A : P	N : P
Slaughter mass (kg)	Initial	175,00	162,40	164,60							
		5,66	5,55	3,36							
	290	290,60	287,20	291,20							
		12,82	4,44	7,40							
	340	340,00	334,40	340,40							
		4,85	4,16	6,99							
	390	388,60	394,00	387,00							
		8,23	10,79	11,47							
	$\bar{x}$	298,55	294,50	295,80	2,61	1,43	2271,71***	1,60	NS	NS	NS
EBM (kg)	Initial	156,74	144,42	145,74							
		4,43	2,99	3,09							
	290	267,28	264,92	264,38							
		11,85	6,02	6,84							
	340	313,80	310,08	308,98							
		2,77	4,74	6,70							
	390	355,54	364,64	358,16							
		10,80	8,91	6,42							
	$\bar{x}$	273,34	271,02	269,32	2,55	1,71	2545,41***	2,10*	NS	NS	NS
Days fed		–	–	–							
		–	–	–							
	290	105,00	123,00	110,40							
		13,10	16,19	11,33							
	340	154,00	173,60	170,80							
		9,90	24,95	27,82							
	390	208,40	229,40	250,60							
		27,41	31,06	28,17							
	$\bar{x}$	155,80	175,33	177,27	13,29	4,17**	100,85***	1,08	*	**	NS
ADG (g/d)	Start—290	1193,74	1080,08	1152,60							
		125,68	86,94	135,92							
	290—340	1023,98	916,68	917,00							
		76,67	219,77	120,24							
	340—390	897,58	849,20	796,25							
		155,72	203,63	227,59							
	$\bar{x}$	1038,43	948,89	955,28	16,35	1,70	12,30	0,20***	NS	NS	NS
FCR (kg/kg)	Start—290	5,72	5,88	5,76							
		0,43	0,43	0,63							
	290—340	7,63	8,73	8,28							
		0,80	1,47	0,82							
	340—390	8,84	9,74	10,19							
		1,39	1,89	2,28							
	$\bar{x}$	7,40	8,12	8,08	16,44	1,80	31,21***	0,43	NS	NS	NS

*** $P < 0,01$; ** $P < 0,05$; * $P < 0,10$.

Table 3 Two-way analysis of variance of cold carcass mass (CCM), dressing percentage (DP), carcass compactness, hind quarter compactness, percentage hind quarter, subcutaneous fat thickness (SCF), and grading

		Mean and SD				*F* value			Least significant difference (breed)		
Parameter	Group	Afrikaner	Nguni	Pedi	CV %	Breed	Mass	B × M	A : N	A : P	N : P
CCM (kg)	Initial	91,68	84,02	86,28							
		2,03	3,82	3,09							
	290	159,00	164,50	161,54							
		7,19	4,92	3,31							
	340	189,52	195,80	189,38							
		3,58	6,23	8,61							
	390	220,26	237,56	222,08							
		9,41	6,82	12,25							
	$\bar{x}$	165,12	170,47	164,82	3,97	4,61**	1201,70***	3,29***	**	NS	**
DP	Initial	59,47	59,02	60,19							
		0,48	2,07	1,70							
	290	60,47	63,23	62,06							
		1,31	1,41	0,91							
	340	61,50	64,35	62,58							
		0,98	1,36	1,88							
	390	63,31	66,46	62,46							
		0,87	2,31	2,64							
	$\bar{x}$	61,19	63,27	61,82	2,60	8,70	20,88	2,70	***	NS	**
Carcass compactness (kg/cm)	Initial	0,48	0,44	0,46							
		0,01	0,02	0,02							
	290	0,73	0,76	0,73							
		0,04	0,02	0,03							
	340	0,82	0,84	0,81							
		0,01	0,03	0,04							
	390	0,92	1,01	0,93							
		0,04	0,02	0,07							
	$\bar{x}$	0,74	0,76	0,73	4,54	5,02**	576,27**	3,04**	**	NS	**
Hind quarter compactness (kg/cm)	Initial	0,36	0,33	0,34							
		0,02	0,01	0,01							
	290	0,55	0,57	0,56							
		0,03	0,01	0,06							
	340	0,62	0,65	0,60							
		0,01	0,02	0,02							
	390	0,68	0,77	0,69							
		0,02	0,02	0,03							
	$\bar{x}$	0,55	0,58	0,55	4,48	9,45***	589,32***	5,09***	***	NS	***
Hind quarter mass (%) (-kidney)	Initial	50,28	49,87	50,44							
		0,81	1,09	1,04							
	290	49,73	48,77	50,07							
		0,47	1,40	3,22							
	340	48,77	48,56	48,41							
		0,30	0,43	1,06							
	390	47,69	48,04	47,77							
		1,18	1,07	1,54							
	$\bar{x}$	49,12	48,81	49,17	2,75	0,41	8,93***	0,42	NS	NS	NS
SCF (mm)	Initial	0,00	0,00	0,02							
		0,00	0,00	0,04							
	290	2,77	3,30	3,80							
		1,28	2,47	1,01							
	340	4,72	4,06	5,75							
		2,94	2,63	1,84							
	390	5,73	3,53	6,15							
		1,34	1,43	2,70							
	$\bar{x}$	3,31	2,72	3,93	54,22	2,25	25,65***	0,78	NS	NS	*
Grading (1—4)	Initial	1,00	1,00	1,00							
		0,00	0,00	0,00							
	290	3,20	3,40	3,20							
		0,45	0,55	0,45							
	340	3,60	3,80	3,40							
		0,55	0,45	0,55							
	390	3,60	3,80	3,80							
		0,55	0,45	0,45							
	$\bar{x}$	2,85	3,00	2,85	14,76	0,82	134,42***	0,33	NS	NS	NS

*** $P < 0,01$; ** $P < 0,05$; * $P < 0,10$.

Table 4 Two-way analysis of variance of percentage feet, head and tongue, hide, oesophagus, trachea, lung, heart and liver, empty stomach and intestines, omental fat of empty body mass and percentage kidney, kidney and channel fat in the carcass

		Mean and SD				*F* value			Least significant difference		
Parameter	Group	Afrikaner	Nguni	Pedi	CV %	Breed	Mass	B × M	A : N	A : P	N : P
Feet (%)	Initial	3,20	3,42	3,28							
		0,23	0,19	0,14							
	290	2,48	2,33	2,60							
		0,43	0,37	0,07							
	340	2,46	2,32	2,46							
		0,11	0,12	0,20							
	390	2,46	2,26	2,27							
		0,12	0,22	0,18							
	$\bar{x}$	2,65	2,58	2,65	8,53	0,63	61,12***	1,44	NS	NS	NS
Head and tongue (%)	Initial	6,71	6,88	6,78							
		0,36	0,33	0,21							
	290	5,41	5,63	5,61							
		0,75	0,30	0,31							
	340	6,10	5,48	6,02							
		0,31	0,18	0,43							
	390	5,86	5,44	5,69							
		0,40	0,17	0,51							
	$\bar{x}$	6,02	5,86	6,03	6,49	1,19	31,78***	1,58	NS	NS	NS
Hide (%)	Initial	9,46	8,68	9,15							
		0,42	0,68	0,40							
	290	10,36	9,50	9,68							
		0,94	0,58	0,54							
	340	10,38	9,23	9,63							
		1,13	0,52	0,48							
	390	10,34	8,84	10,08							
		0,71	0,94	0,97							
	$\bar{x}$	10,14	9,06	9,64	7,60	10,85***	3,36**	0,60	***	*	**
Oesophagus, trachea, lung, heart and liver	Initial	4,00	4,01	3,95							
		0,34	0,33	0,21							
	290	3,84	3,58	4,09							
		0,19	0,19	0,16							
	340	3,71	3,64	3,56							
		0,07	0,08	0,13							
	390	3,49	3,30	3,18							
		0,18	0,24	0,21							
	$\bar{x}$	3,76	3,63	3,70	5,69	1,73	27,97***	2,98**	NS	NS	NS
Empty stomach and intestines (%)	Initial	7,29	7,45	7,60							
		0,40	0,86	0,28							
	290	6,24	5,75	5,73							
		0,85	0,53	0,62							
	340	5,38	5,18	5,49							
		0,49	0,15	0,36							
	390	4,95	4,50	4,88							
		0,46	0,56	0,40							
	$\bar{x}$	5,97	5,72	5,93	9,13	1,20	68,83***	0,69	NS	NS	NS
Omental fat (%)	Initial	0,45	0,34	0,48							
		0,14	0,11	0,10							
	290	0,81	0,84	1,11							
		0,22	0,21	0,33							
	340	0,92	0,75	0,98							
		0,15	0,09	0,27							
	390	1,04	0,99	0,97							
		0,24	0,31	0,11							
	$\bar{x}$	0,81	0,73	0,89	25,71	2,83*	23,36***	0,94	NS	NS	*
Kidney, (%) kidney and channel fat	Initial	1,52	1,28	1,31							
		0,30	0,14	0,26							
	290	1,82	1,74	2,52							
		0,33	0,30	0,27							
	340	1,95	1,74	2,66							
		0,34	0,30	0,48							
	390	1,96	2,21	2,08							
		0,26	0,74	0,38							
	$\bar{x}$	1,81	1,74	2,14	19,43	6,78***	13,82***	3,24***	NS	**	***

*** $P < 0,01$; ** $P < 0,05$; * $P < 0,10$.

Table 5 Two-way analysis of variance of percentage muscle, fat, bone, subcutaneous fat (SCF), meat and total meat (meat plus SCF) on carcass

Parameter	Group	Mean and SD			CV %	*F* value			Least significant difference (breed)		
		Afrikaner	Nguni	Pedi		Breed	Mass	B × M	A : N	A : P	N : P
Muscle (%)	Initial	73,99	71,87	71,47							
		3,55	1,63	1,61							
	290	67,43	68,77	61,43							
		7,47	2,28	1,68							
	340	68,25	68,23	64,92							
		1,25	3,46	2,26							
	390	68,58	66,00	67,17							
		3,39	3,49	5,41							
	$\bar{x}$	69,56	68,72	66,25	5,24	4,65 *	9,95 ***	1,38	NS	**	*
Fat (%)	Initial	8,20	7,35	10,48							
		3,10	1,50	2,02							
	290	18,11	16,47	23,55							
		7,20	2,13	2,55							
	340	17,75	17,65	20,32							
		1,86	3,80	3,12							
	390	17,35	19,32	19,11							
		3,17	3,63	5,55							
	$\bar{x}$	15,35	15,20	18,37	22,43	4,77 **	29,16 ***	0,88	NS	**	**
Bone (%)	Initial	17,34	19,96	18,21							
		0,58	0,92	0,75							
	290	13,78	14,16	14,49							
		0,65	0,85	1,08							
	340	13,71	13,41	14,12							
		0,74	0,90	1,26							
	390	13,31	13,34	13,18							
		1,17	1,01	0,23							
	$\bar{x}$	14,54	15,22	15,00	5,94	3,10 *	111,28 ***	3,30 ***	**	NS	NS
SCF (%)	Initial	0,62	0,03	0,55							
		1,03	0,07	0,55							
	290	4,72	4,11	3,92							
		1,23	0,81	0,62							
	340	4,97	4,15	4,40							
		1,51	1,02	1,00							
	390	5,77	4,76	5,23							
		0,86	0,65	0,71							
	$\bar{x}$	4,02	3,26	3,53	25,18	3,58 **	86,25 ***	0,24	**	NS	NS
Meat (%)	Initial	82,04	80,01	81,24							
		1,48	0,88	0,86							
	290	81,50	81,73	81,58							
		1,39	1,49	1,32							
	340	81,32	82,31	81,47							
		1,43	0,90	1,49							
	390	80,93	81,90	81,58							
		0,83	1,42	0,78							
	$\bar{x}$	81,45	81,49	81,47	1,50	0,01	0,70	1,77	NS	NS	NS
Total meat (%)	Initial	82,66	80,04	81,79							
		0,58	0,92	0,75							
	290	86,22	85,84	85,51							
		0,65	0,85	1,08							
	340	86,29	86,47	85,87							
		0,73	0,83	1,30							
	390	86,70	86,66	86,82							
		1,16	1,01	0,23							
	$\bar{x}$	85,47	84,75	85,00	1,04	3,36 **	110,98 ***	3,15 **	**	NS	NS

*** $P < 0,01$; ** $P < 0,05$; * $P < 0,10$.

ratios did not differ either. A significant difference ($P < 0,05$) was found between breeds with respect to the number of days fed, with the Afrikaner requiring the shortest period. This can be ascribed to the slightly higher initial mass of these bulls, compounded with the slightly, though non-significantly, higher average daily gain of the Afrikaners.

Slaughter mass and empty body mass did not differ significantly between the breeds (Table 2). The breeds differed in cold carcass mass ($P < 0,05$) (Table 3), with an interaction between mass and breed ($P < 0,01$), the Nguni yielding a heavier carcass than either the Afrikaner or Pedi ($P < 0,05$). These differences are also reflected in the dressing percentage (Table 3). Commercially, dressing percentage, which is calculated as the percentage ratio of warm carcass mass (kidneys, kidney and channel fat intact) to empty body mass, is an important yield parameter. The proportions which feet, head and tongue, hide, oesophagus, trachea, lung, heart, liver, empty stomach and intestines and omental fat comprise of empty body mass, are shown in Table 4, and must be taken into account when comparing dressing percentages. The percentage hide and omental fat differed between these breeds ($P < 0,01$ and $P < 0,05$ respectively), with the Nguni having the lowest proportion of hide and the lowest omental fat content. Although the partitioning of body fat to favour carcass fat is a major contributing factor to a high dressing percentage, other effects also need to be considered. Hide mass alone may be responsible for differences in dressing percentage between the breeds, with a heavy hide reducing the dressing percentage (Buvanendran, Ikhatua, Abubakar & Olayiwole, 1983). These two factors account for the high dressing percentage of the Nguni. The Nguni also recorded the lowest percentage kidney, kidney and channel fat, differing from the Pedi ($P < 0,01$) which had the highest proportions.

Regarding gross carcass composition (Table 5), the breeds differed in percentage muscle ($P < 0,01$), percentage fat ($P < 0,05$), and percentage bone ($P < 0,10$), with a significant breed × mass interaction ($P < 0,01$). Specifically, the Nguni had the highest bone content differing from the Afrikaner ($P < 0,05$), the Pedi the highest fat (%) differing from both the Afrikaner and Nguni ($P < 0,05$), and the Pedi the lowest proportion of muscle, differing from both the Nguni ($P < 0,10$) and the Afrikaner ($P < 0,05$). The Pedi's carcass fat content was greater than that of the Afrikaner and Nguni at 290 kg ($P < 0,05$) and 340 kg (NS). At 390 kg no breed differences in composition occurred.

Partitioning of carcass fat is reflected in the percentage subcutaneous fat (SCF) with the Afrikaner having the highest proportion and the Nguni the lowest. The importance of SCF in affecting total meat yield is shown in the differences between meat yield (which does not include SCF) and total meat yield (which includes SCF) (Table 5). No differences were noted between the breeds when SCF was not included. By including SCF, the Afrikaner derived an advantage by producing a greater total, though fatter, meat yield over the lean Nguni ($P < 0,05$). No differences were found between breeds in the thickness of the subcutaneous fat or the grades achieved (Table 3). The single measurement of SCF thickness, although a mean of two measurements, may be insufficient to establish a reliable indication of SCF thickness (Naudé & Bruwer, 1986), since fat distribution over the carcass is not taken into account. The grading, however, was an overall evaluation. At the three slaughter masses, the mean values achieved indicated the average grade as A1. Clearly, as the masses increased the weighting changed to a mean closer to the Super A grade, with the Nguni and Pedi achieving the highest averages.

The length per mass ratio indicates compactness and is incorporated in the concept of carcass conformation. Carcass compactness (Table 3) differed between the breeds ($P < 0,05$), with the Nguni displaying the more compact carcass. Compactness of the hind quarter showed the same tendency where breed differences and interactions were found to be highly significant ($P < 0,01$). In reviewing carcass conformation as an evaluation parameter, Klingbiel (1984) concluded that conformation is a poor predictor of carcass composition and joint yield. This was confirmed in our results where fleshing contributed only 11,1% to yield and finish 79,8% (Klingbiel, 1984). Only in extreme cases does conformation influence the carcass lean yield. The interactions found in this study would confirm that a consistent breed effect was not found at the four slaughter masses.

Conclusion

These results indicate that only minor differences in carcass characteristics prevail between young Afrikaner, Nguni and Pedi bulls. The differences did not affect percentage meat yield and only marginally affected the percentage total meat yield which included the subcutaneous fat. The only commercial advantage which one breed may have over the other was the shorter period the Afrikaner and Nguni breeds required to attain the final slaughter mass of 390 kg, and the higher carcass yield (dressing percentage and cold carcass mass) of the Nguni. Although the Nguni had the more compact carcass and hind quarter, the characteristic was not reflected in the percentage meat yield or the grading scores.

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