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MEAT PRODUCTION POTENTIAL OF MOUNTAIN REEDBUCK

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OPSOMMING: VLEISPRODUKSIEPOTENSIAAL VAN DIE ROOIRIBBOK

Nege-en-dertig volwasse rooiribbokke *(Redunca fulvorufula)* is by die Loskopdam Natuurreservaat gedurende 1971–72 versamel. Uitslagpersentasies het van 44,0–62,4% gewissel. Seisoenale variasie in karkasmassa en uitslagpersentasies is noemenswaardig. Ramkarkasse, versamel gedurende Julie–Oktober, was gemiddeld 41% ligter, en ooie 24%, as dié versamel gedurende Maart–Junie. Hierdie verskille is dalk beïnvloed deur ouderdomsverskille in die klein monsters, maar toetse gebaseer op ouderdomsmaatstawwe vir tandslytasie en horingringtellings het aangetoon dat ouderdomsverskille min tot die verskille wat opgemerk is, bygedra het.

SUMMARY:

Thirty-nine adult mountain reedbuck *(Redunca fulvorufula)* were collected on the Loskop Dam Nature Reserve during 1971–72. Dressing percentages ranged from 44,0–62,4% Seasonal variation in carcass masses and dressing percentages was pronounced with carcasses collected during July–October averaging 41% lighter for males and 24% lighter for females than those collected during March–June. These differences may have been accentuated to some extent through age bias in the small sample taken, but tests on age indices based on tooth wear and horn ring counts indicate that age bias contributed little to the observed differences.

During a two year study of mountain reedbuck *(Redunca fulvorufula fulvorufula* Afzelius) on the Loskop Dam Reserve, 39 adult mountain reedbuck were collected for examination of reproductive tracts, rumen contents, parasites, and condition. The carcasses were then used for a limited meat production study. This paper discusses seasonal changes in body composition and carcass yield.

The Loskop Dam Nature Reserve is a provincial reserve located approximately 150 km east of Pretoria and consists of 12 762 ha of rugged hills surrounding an irrigation reservoir completed in 1938. Acocks (1953) classifies the vegetation as mixed bushveld, but a wide spectrum of plant communities is found on the reserve (Theron, 1973).

The grass components of these communities are of special interest since mountain reedbuck feed predominantly on grass. Nutrient content of grasses on the reserve, as evidenced by ungulate condition, appears adequate during the summer months but drops to low levels during the winter (Transvaal Nature Conservation Division, 1970). A preliminary analysis of crude protein content of grass leaves from eight of 100 samples (each sample consisting of random clippings from 10–25 bunches) collected at Loskop during July 1973 supports the idea of low winter nutrient levels. Mean values of replicates ranged from 2,6% for *Loudetia simplex* leaves to 6,2% for *Panicum maximum* leaves (Irby, 1974). None of the seven species analysed reached the 7% crude protein level considered to be the minimum maintenance requirement for cattle (Weinmann, 1951).

Procedure

Mountain reedbuck were collected by the manager of Loskop, Mr. C.J. Smit, using a 0,22 Hornet or 0,243 rifle. A goal of two adult females every month and three adult males every two months, to be collected over a one year period, was set at the onset of the project. Shooting difficulties led to a five month extension of the collection period. Animals were taken from all sections of the reserve.

Carcasses were brought to a storage hut used as a temporary laboratory for mass determination and dissection. Time between shooting and initial mass determination was variable because some animals were shot several kilometers from the recovery vehicle in rough terrain at night. No attempt was made to determine blood mass. Blood remaining in the body at the initial mass determination was lumped with dressing error under the category of "unaccounted mass".

Ledger's (1963) procedure in the format presented by Van Zyl (1968) was used for butchering carcasses rather than the procedure recommended by von La Chevallerie (Huntley, 1971) and Skinner (personal communication) since no published descriptions were available when the study was initiated. Mass was determined using a 45 kg – capacity spring scale for body components with a mass greater than 1 kg. Smaller body part masses were measured using a gram balance. Meat yield data were rounded off to the nearest 25 g.

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Terminology

Body mass – Mass of the animal as it was brought to the laboratory.

Fresh-dressed carcass mass – mass of the carcass less skin, head, tail, feet, and viscera immediately following dressing. This differs from Ledger's (1963) "dressed carcass weight" category in that kidneys and kidney fat were removed before mass determination. Since mountain reedbuck fat concentrations are low compared to cattle, dressing percentages presented in this paper are a maximum of 2% lower than those calculated using Ledger's procedure.

Hung carcass mass – dressed carcass mass following a cooling period.

External offal – the unskinned head, wet skin, tail without skin, and unskinned feet.

Internal offal – all viscera including kidneys and associated fat. Blood is not included.

Forequarters – the neck, forelegs, and thorax separated from the rest of the carcass between the 10th and 11th ribs. This component was divided into **forelegs** and neck **and thorax.**

Hindquarters – the hindlegs, pelvis, loins, and flanks of each carcass. This component was further divided into **loins and flanks** and **hindlegs** following Ledger (1963). The **hindlegs** sub-component corresponds to the "rump" and "buttock" mutton cuts (Huntley, 1971).

Fat – deposits of fat under the forelegs and in the vicinity of the ribs, vertebrae, pelvis, and haunches which were removed and measured separately in the 11 carcasses for which total meat yield was calculated. These deposits were generally small and contributed little mass to the carcass.

Butcher bone – bone, cartilage, and tendons remaining after removal of flesh and fat.

Statistical treatment

The 39 animals in the sample were divided into classes by sex, based on the slightly greater masses of males (Irby, 1973), and by season of collection. Three four-month seasons were used. July–October represented the winter season when individuals were forced to survive on grazing of reduced palatability (Transvaal Nature Conservation Division, 1970). November–February represented the rainy season during which new growth was available. March – June coincided with autumn and early winter. Data for January–May 1971 have been combined with data from corresponding months in 1970. Tables 1–4 contain means, ranges, and standard deviations for each sex-season group. The coefficient of variation (C.V.) was included as a gauge for comparison of variation between components with grossly different masses.

Plots of data indicate that a non-linear regression model would provide a better fit than the one-way analysis of variance and simple linear regression used in this paper, but a more complex analysis on such a small sample cannot be justified without a reliable technique for age determination. An analysis of variance of a subjective division of adult animals into age classes based on tooth wear (Irby, 1973) and a regression of mass on horn ring counts for males (Irby, 1974) suggests that any carcass mass differences due to age bias in the sample were over-shadowed by differences associated with the month of collection.

Results

Body masses of adult males ranged from 21,8 kg to 37,6 kg (Table 1). Adult female body masses ranged from 23,0 kg to 35,2 kg (Table 2). The mean male dressed carcass mass during July–October (12,3 kg) was 41% lighter than the mean for March–June (Table 3). Females averaged a 24% decrease from autumn to winter (Table 4).

Linear regressions (Steel and Torrie, 1960) were run on the ascending and descending phases of the plot of fresh-dressed carcass mass vs. month of collection (Figure 1).

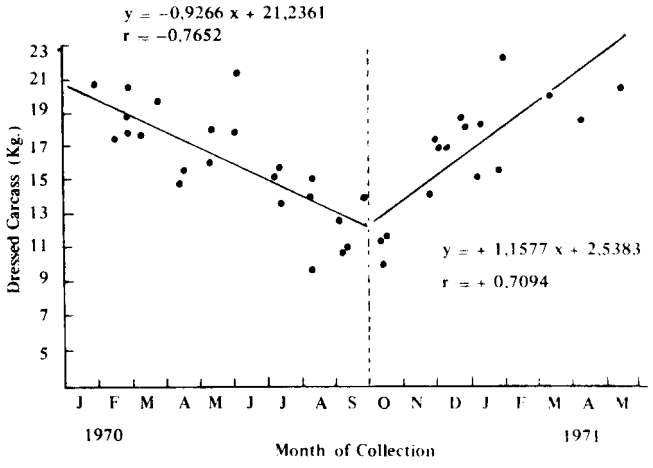

Fig. 1 *Regression of dressed carcass mass against month of collection for 39 adult mountain reedbuck collected on the Loskop Dam Nature Reserve during 1970–71*

An F test on each phase (Table 5) indicated a highly significant relationship between month of collection and carcass mass. The simple linear regression alone accounted for 59% of the variation in carcass mass on the descending phase (r^2 = 0,5855) and for 50% on the ascending phase (r^2 = 0,5032).

A one-way analysis of variance (Steel and Torrie, 1960) with treatments designated as the six sex-season groups was made for comparison (Table 6). A highly significant ($p < 0,01$) "between treatments" variation was obtained. Duncan's New Multiple Range Test with Kramer's modification for unequal sample sizes (Kramer, 1956) was used as a test for differences between treatment means (Table 6). No significant mass differences between males and females collected in the same season were detected except for the March–June period (0,01 protection level). No statistical difference was detected between animals of the same sex collected during November–February vs those collected during March–June. Animals collected during July–October were significantly lighter than those collected during the other two seasons (0,01 protection level).

Table 1

Masses of internal organs and external inedible body components of 16 adult male mountain reedbuck collected on the Loskop Dam Nature Reserve during 1970–71

ITEM	JUL – OCT					NOV – FEB					MAR – JUN				
	N	$\bar{x}$	RANGE	S.D.	C.V.	N	$\bar{x}$	RANGE	S.D.	C.V.	N	$\bar{x}$	RANGE	S.D.	C.V.
Body mass	5	25,9 kg	21,8–29,7 kg	3,343	13%	7	32,7 kg	29,2–37,6 kg	2,979	9%	4	34,2 kg	33,0–35,0 kg	0,903	3%
Head	5	1,8 kg	1,7–2,0 kg	0,110	6%	6	2,0 kg	1,9–2,0 kg	0,098	5%	4	2,0 kg	1,8–2,0 kg	0,100	5%
Skin	5	1,5 kg	1,4–1,7 kg	0,130	9%	6	1,7 kg	1,4–1,9 kg	0,179	11%	4	1,7 kg	1,6–1,8 kg	0,096	6%
Feet (with skin)	5	805 g	782–881 g	43,581	5%	6	845 g	748–904 g	63,000	7%	3	888 g	807–1039 g	130,885	15%
Tail (w/o skin)	5	41 g	28–60 g	12,442	30%	7	58 g	47–75 g	10,045	17%	4	66 g	59–78 g	8,103	12%
Heart	5	181 g	149–202 g	23,145	13%	7	246 g	187–288 g	41,222	17%	4	271 g	256–282 g	11,529	4%
Lungs & Trachea	4	337 g	287–360 g	34,558	10%	3	453 g	367–501 g	74,393	16%	4	420 g	360–453 g	41,226	10%
Misc. mesentery	5	42 g	27–55 g	10,536	25%	5	76 g	41–142 g	39,646	52%	4	79 g	58–109 g	22,366	28%
Liver (with gall bladder)	5	253 g	200–298 g	34,974	14%	7	449 g	399–581 g	70,821	16%	4	436 g	346–492 g	69,553	16%
Esophagus	5	36 g	30–40 g	4,147	12%	6	30 g	22–38 g	6,058	20%	4	34 g	32–37 g	2,380	7%
Diaphragm	5	111 g	84–142 g	25,975	23%	4	144 g	119–161 g	18,083	13%	4	155 g	125–178 g	22,066	14%
Rumen (empty)	5	0,8 kg	0,7–0,9 kg	0,110	14%	7	0,9 kg	0,7–1,1 kg	0,180	20%	4	0,8 kg	0,7–0,9 kg	0,096	12%
Rumen contents	5	4,8 kg	3,6–5,9 kg	0,940	20%	7	3,5 kg	3,0–3,8 kg	0,387	11%	4	3,6 kg	2,7–4,4 kg	0,850	24%
Full intestines	5	1,2 kg	1,1–1,4 kg	0,110	9%	7	1,3 kg	1,0–1,6 kg	0,215	17%	4	1,1 kg	0,9–1,5 kg	0,287	26%
Kidneys (w/o fat)	5	63 g	54–67 g	5,718	9%	7	82 g	62–101 g	14,852	18%	3	83 g	77–88 g	5,686	7%
Kidney fat and mesentery	5	14 g	12–17 g	2,049	15%	6	55 g	28–99 g	29,550	54%	4	57 g	25–118 g	41,737	73%
Spleen	5	58 g	37–74 g	15,000	26%	6	110 g	75–139 g	21,788	20%	3	104 g	87–122 g	17,502	17%
Reproductive tract (with bladder)	5	167 g	95–246 g	65,673	39%	6	162 g	107–196 g	41,098	25%	4	280 g	205–414 g	95,873	34%
Testes & epididymides	5	32 g	22–43 g	8,585	27%	7	48 g	37–61 g	8,952	19%	4	46 g	41–55 g	6,185	13%

Table 2

Mean masses of internal and external offal by season of adult female mountain reedbuck from Loskop Dam

ITEM	JUL – OCT					NOV – FEB					MAR – JUN				
	N	$\bar{x}$	RANGE	S.D.	C.V.	N	$\bar{x}$	RANGE	S.D.	C.V.	N	$\bar{x}$	RANGE	S.D.	C.V.
Body mass	8	26,4 kg	23,0–291 kg	2,097	8%	8	31,2 kg	24,1–35,2kg	4,644	15%	7	30,9 kg	27,0–34,1 kg	2,978	10%
Head	8	1,4 kg	1,2–1,5 kg	0,099	7%	8	1,5 kg	1,4–1,6 kg	0,009	7%	7	1,5 kg	1,4–1,7 kg	0,115	8%
Skin	8	1,2 kg	0,9–1,4 kg	0,151	13%	8	1,2 kg	0,9–1,4 kg	0,181	15%	7	1,2 kg	1,0–1,4 kg	0,177	15%
Feet (with skin)	8	706 g	613–811 g	63,873	9%	8	753 g	690–809 g	43,569	6%	6	784 g	715–872 g	65,267	8%
Tail (w/o skin)	8	51 g	33–66 g	10,295	20%	8	58 g	50–65 g	6,392	11%	7	62 g	43–91 g	17,144	28%
Heart	7	166 g	127–202 g	25,430	15%	8	220 g	166–258 g	32,711	15%	5	227 g	193–264 g	25,700	11%
Lungs & trachea	4	391 g	319–471 g	63,866	16%	4	375 g	340–445 g	47,268	13%	3	385 g	310–478 g	85,434	22%
Misc. mesentery	8	37 g	23–62 g	12,253	33%	7	66 g	36–88 g	15,672	24%	5	74 g	33–135 g	37,336	50%
Liver (with gall bladder)	6	283 g	213–374 g	67,117	24%	7	407 g	342–540 g	63,950	16%	6	375 g	314–466 g	55,623	15%
Esophagus	8	36 g	25–46 g	6,319	18%	8	34 g	28–40 g	4,504	13%	7	35 g	27–42 g	6,396	18%
Diaphragm	7	127 g	103–198 g	32,711	26%	6	133 g	117–149 g	11,877	9%	4	143 g	112–193 g	35,128	25%
Rumen (empty)	7	0,8 kg	0,7–0,9 kg	0,076	10%	8	0,9 kg	0,7–1,1 kg	0,155	17%	7	0,9 kg	0,9–1,1 kg	0,090	10%
Rumen contents	8	4,8 kg	3,8–5,8 kg	0,780	16%	8	3,7 kg	2,9–5,2 kg	0,694	19%	7	4,4 kg	3,9–5,4 kg	0,669	15%
Full intestines	7	1,1 kg	0,9–1,4 kg	0.181	16%	8	1,3 kg	1,0–1,6 kg	0,233	18%	7	1,4 kg	1,1–2,0 kg	0,337	24%
Kidneys (w/o fat)	7	66 g	60–79 g	6,237	9%	8	84 g	73–112 g	12,672	15%	7	82 g	64–98 g	10,950	13%
Kidney fat & mesentery	7	21 g	11–29 g	7,413	35%	7	44 g	22–84 g	24,379	55%	7	78 g	12–175 g	66,492	85%
Spleen	7	75 g	45–142 g	37,910	51%	8	100 g	86–140 g	17,615	18%	7	97 g	65–153 g	31,903	33%
Bladder (& urine)	8	21 g	8–68 g	19,506	93%	6	21 g	16–30 g	6,387	30%	7	15 g	7–18 g	3,958	26%
Reproductive tract* (w/o bladder)	8	1,3 kg	0,1–2,5 kg	0,850	67%	8	2,1 kg	0,1–5,0 kg	2,106	100%	7	0,5 kg	0,1–3,0 kg	1,090	218%
Fetus weights	7	411 g	25 882 g	298,317	73%	4	2,2 kg	1,1–3,1 kg	0,822	37%	3	603 g	1–1800 g	–	–
Udder (with milk)	8	47 g	37–73 g	12,948	28%	8	205 g	40–654 g	208,559	102%	7	188 g	46–415 g	147,658	79%

* All reproductive tracts rounded to 0,1 kg

Table 3

Carcass components of adult male mountain reedbuck from Loskop Dam by season

ITEM	JUL - OCT					NOV - FEB					MAR - JUN				
	N	$\bar{x}$	RANGE	S.D.	C.V.	N	$\bar{x}$	RANGE	S.D.	C.V.	N	$\bar{x}$	RANGE	S.D.	C.V.
Body mass	5	25,9 kg	21,8–29,7kg	3,343	13%	7	32,7 kg	29,2–37,6kg	2,979	9%	4	34,2 kg	33,0–35,0 kg	0,903	3%
Total offal	5	12,2 kg	11,2–13,9kg	1,026	8%	7	12,3 kg	10,7–13,7kg	1,009	8%	4	11,9 kg	10,9–12,7 kg	0,918	8%
Fresh dressed carcass	5	12,3 kg	9,8–15,5kg	2,396	19%	7	19,5 kg	17,5–22,7 kg	1,947	10%	4	20,8 kg	20,4–21,6 kg	0,656	3%
Unaccounted mass (blood + error)	5	1,3 kg	0,8–1,7 kg	0,342	27%	7	1,0 kg	0,4–1,9 kg	0,469	47%	4	1,6 kg	1,0–2,0 kg	0,444	29%
Hanging time	5	7,5 h	2,5–11,0 h	3,102	41%	7	7,5 h	7,0–9,5 h	0,945	12%	4	11,5 h	6,5–17,0 h	4,528	39%
Hang carcass mass	5	11,9 kg	9,2–15,2kg	2,590	22%	7	19,0 kg	17,0–22,2kg	1,960	10%	4	20,2 kg	18,9–21,1 kg	0,947	5%
Loss in hanging	5	0,4 kg	0,1–0,7 kg	0,245	61%	7	0,4 kg	0,2–0,6 kg	0,140	32%	4	0,6 kg	0,2–1,2 kg	0,408	68%
CARCASS DIVISIONS															
Forequarters	4	5,4 kg	4,3–7,5 kg	1,427	26%	6	8,7 kg	7,8–10,7kg	1,019	12%	4	9,4 kg	9,0–9,8 kg	0,350	4%
a) Forelegs	4	2,1 kg	1,8–2,8 kg	0,476	23%	7	3,3 kg	2,8–3,9 kg	0,326	10%	4	3,5 kg	3,4–3,6 kg	0,082	2%
b) Neck and thorax	4	3,4 kg	2,6–4,7 kg	0,947	28%	6	5,5 kg	4,9–6,8 kg	0,703	13%	4	5,9 kg	5,7–6,2 kg	0,222	4%
Hindquarters	5	6,3 kg	4,9–7,7 kg	1,314	21%	6	10,1 kg	9,0–11,6 kg	1,139	11%	4	10,8 kg	10,0–11,6 kg	0,658	6%
a) Loins & flanks	5	1,6 kg	1,2–2,2 kg	0,456	28%	6	2,8 kg	2,4–3,2 kg	0,349	12%	4	3,1 kg	2,7–3,2 kg	0,238	8%
b) Hindlegs	5	4,7 kg	3,6–5,7 kg	0,948	20%	7	7,4 kg	6,5–8,4 kg	0,741	10%	4	7,7 kg	7,3–8,4 kg	0,479	6%
MEAT YIELD FROM ONE HINDLEG & 1/2 PELVIS															
Edible *															
(meat + fat)	5	1825 g	1450–2450g	496,676	27%	4	3025 g	2725–3500g	344,601	11%	3	3150 g	2875–3350 g	246,221	8%
Inedible*															
(butcher bone)	5	500 g	450–525 g	33,541	7%	4	525 g	500–600g	47,324	9%	3	550 g	500–600 g	52,042	9%

* Masses rounded to nearest 25 g.

Table 4

Carcass components of adult female mountain reedbuck from Loskop Dam by season

ITEM	JUL – OCT					NOV – FEB					MAR – JUN				
	N	$\bar{x}$	RANGE	S.D.	C.V.	N	$\bar{x}$	RANGE	S.D.	C.V.	N	$\bar{x}$	RANGE	S.D.	C.V.
Body mass	8	26,4 kg	23,0 - 29,1	2,097	8%	8	31,2 kg	24,1 – 35,2kg	4,644	15%	7	30,9 kg	27,0 – 34,1kg	2,978	10%
Total offal	8	12,5 kg	11,4 – 13,5k	0,658	5%	8*	13,1 kg	9,2 – 16,5kg	2,769	21%	7*	12,4 kg	10,6 – 13,8kg	1,378	11%
Fresh dressed carcass	8	13,1 kg	10,2 – 15,9kg	2,091	16%	8	17,1 kg	14,3 – 19,2kg	1,725	11%	7	17,2 kg	15,0 – 18,8kg	1,477	9%
Uncounted mass (blood + error)	8	0,9 kg	0,4 – 1,6 kg	0,440	49%	8*	1,0 kg	0,5 – 1,5 kg	0,450	46%	7*	1,2 kg	0,5 – 2,0 kg	0,464	38%
Hanging time	7	8,5 h	0,5 – 13,5kg	5,273	61%	8	8,5 h	8,0 – 10,0 h	0,744	9%	6	8,0 h	1,0 – 24,0 h	8,524	107%
Hung carcass mass	7	12,5 kg	10,0 – 15,2kg	2,146	17%	8	16,6 kg	13,8 – 18,8kg	1,761	11%	7	16,9 kg	15,0 – 18,2 kg	1,253	7%
Loss in hanging	7	0,4 kg	0,0 – 0,9 kg	0,360	81%	8	0,4 kg	0,2 – 0,6 kg	0,140	31%	6	0,3 kg	0,0 – 0,6 kg	0,264	83%
CARCASS DIVISIONS															
Forequarters	8	5,4 kg	4,4 – 6,4 kg	0,850	16%	8	7,0 kg	5,9 – 8,0 kg	0,761	11%	7	7,3 kg	6,4 – 7,7 kg	0,550	8%
a) Forelegs	8	2,3 kg	1,8 – 2,7 kg	0,405	18%	8	2,8 kg	2,4 – 3,3 kg	0,307	11%	7	3,0 kg	2,7 – 3,3 kg	0,243	8%
b) Neck & Thorax	8	3,1 kg	2,6 – 3,6 kg	0,397	13%	8	4,1 kg	3,5 – 4,8 kg	0,501	12%	7	4,2 kg	3,4 – 4,5 kg	0,431	10%
Hindquarters	7	7,1 kg	5,6 – 8,9 kg	1,350	19%	8	9,6 kg	8,0 – 10,9kg	1,044	11%	7	9,7 kg	8,6 – 10,4kg	0,751	8%
a) Loins & flanks	8	2,0 kg	1,5 – 2,4 kg	0,413	21%	8	2,6 kg	2,0 – 3,1 kg	0,314	12%	7	2,7 kg	2,3 – 3,0 kg	0,313	12%
b) Hindlegs	8	5,3 kg	4,1 – 6,5 kg	0,894	17%	8	7,0 kg	5,9 – 8,2 kg	0,817	12%	7	7,1 kg	6,4 – 7,7 kg	0,502	7%
MEAT YIELD FROM ONE HINDLEG & 1/2 PELVIS															
Edible**															
(meat + fat)	3	1725 g	1600 – 1850g	125,831	7%	7	2925 g	2377 – 3350g	336,473	12%	3	3100 g	2850 – 3250 g	217,945	7%
Inedible**															
(butcher bone)	3	450 g	450 – 475 g	14,434	3%	7	500 g	450 – 550g	31,339	6%	3	575 g	550 – 625 g	38,188	7%

* Fluid from the uterus of 1 female was lost during dressing. A correction of 0.5 kg was added to total reproductive tract wt.

** Masses rounded to 25 g.

Table 5

Analysis of variance in linear regressions of fresh dressed carcass masses against month of collection

	REGRESSION			AOV				
	N	REGRESSION EQUATION	CORREL. COEF. (r)	SOURCE OF VARIATION	D.F.	SS	MS	F
Jan 70 – Sep 70	23	y = −0,9266 x + 21,2361	−0,7652**	Regression	1	142,239	142,239	22,8430**
				Residual	21	130,763	6,227	
				Total	22	273,002		
Oct 70 – May 71	16	y = +1,1577 x + 2,5383	+0,7094**	Regression	1	88,378	88,378	14,1859**
				Residual	14	87,220	6,230	
				Total	15	175,598		

** Highly significant ($p < 0,01$)

Table 6

Analysis of variance and tests of means using Duncan's New Multiple Range Test with Kramer's (1956) modification for unequal sample sizes for carcass mass vs. sex and season

TREATMENT	AOV				
	SOURCE OF VARIATION	DF	SS	MS	F
1 = Jul–Oct, female	Treatments	5	320,895	64,179	18,9890**
2 = Nov.–Feb, female	Error	33	111,534	3,380	
3 = Mar–Jun, female	Total	38	432,429		
4 = Jul–Oct, male					
5 = Nov–Feb, male					
6 = Mar–Jun, male					

TEST OF MEANS

Ranked trt. no.	#4	#1	#2	#3	#5	#6
No. in sample	5	8	8	7	7	4
Ranked trt. means (kg)*	12,3	13,1	17,1	17,2	19,5	20,8

* Treatment means not joined by the same line are significantly different at 0,01 protection level

Meat yield

Dressing percentages for males averaged 47,5% during July–October, 59,4% during November–February, and 60,6% during March–June. Female dressing percentage was calculated by subtracting the mass of the reproductive tract from the total body mass and dividing this corrected mass into the fresh-dressed carcass mass. Dressing percentages for females averaged 51,7% during July–October, 58,6% during November–February, and 56,3% during March–June. The extremes for the entire 39 animal sample were 44,0% and 62,4%, both males.

Lack of adequate cold storage space made hanging of carcasses for 24 hours impractical. Animals shot at night were skinned, eviscerated, and hung while the internal organs were measured. Animals collected during the morning were partitioned before the internal organs were measured to decrease the possibility of spoilage. Hanging time varied from 0 to 24 h, and the loss of mass through dessication varied from 0,0–7,8% of the fresh-dressed carcass mass (Tables 3 and 4).

Hung carcasses were divided into "forequarters" and "hindquarters" (Tables 3 and 4). The percentage of hung carcass mass for each division was relatively constant for all three seasons. Hindquarter mass as a percentage of hung carcass mass for males ranged from 50,7–56,4%. Females had proportionately heavier hindquarters with extremes of 54,8% and 59,2%.

Eleven carcasses, four males and seven females, were analysed for total carcass meat yield. Half carcasses, medially divided, were separated into meat, fat and butcher bone. The results were extrapolated to the whole carcass (Table 7). The error terms associated with meat yield (0,5–5,9% of hung carcass masses) were the result of dessication during processing and rounding of component masses to the nearest 25 g. Edible (meat + fat) to inedible (butcher bone of ratios ranged from 3,6:1,0 to 5,7:1,0 for males and 3,7:1,0 to 5,7:1,0 for females.

Meat yield from the hindleg and half pelvis of 12 males and 13 females was measured (Tables 3 and 4). A one-way analysis of variance (Table 8) revealed a highly significant ($p < 0,01$) difference among sex-season groups. Orthogonal contrasts of means (Snedecor and Cochran, 1967) indicated that hindleg meat yields during July–October were significantly lighter than yields during the other months of the year (Table 8).

Table 7

Carcass yield as a percentage of hung carcass mass*

Month of collection	Hung Carcass Mass (kg)	Meat (%)	Fat (%)	Butcher Bone (%)	Unaccounted Mass (%)
MALES (N=4)					
Jan 70	20,4	74,5	0,7	18,6	5,9
Feb 70	17,0	74,1	0,1	20,6	4,7
Mar 70	18,9	81,0	0,3	14,3	4,2
Jul 70	15,2	84,2	0,0	15,1	0,7
Mean	17,9	78,4	0,3	17,2	3,9
S.D.	2,262	4,970	0,310	2,963	2,234
FEMALES (N=7)					
Feb 70	18,8	82,4	3,1	14,9	0,0
Feb 70	17,7	80,8	2,5	14,7	1,7
Mar 70	18,0	82,2	0,4	15,0	2,2
May 70	16,1	78,9	0,3	16,8	4,3
Jun 70	17,7	81,4	0,7	16,9	1,1
Sep 70	10,6	74,5	0,0	20,8	5,7
Oct 70	10,7	76,6	0,0	19,6	3,7
Mean	15,7	79,5	1,0	17,0	2,7
S.D.	3,513	3,021	1,265	2,413	1,986

* All carcass meat yields based on extrapolation from 1/2 carcass except the male collected in Jan 70.

Table 8

Analysis of variance and orthogonal contrasts of hindleg meat yield vs. sex and season

TREATMENTS				AOV				
DESIGNATION		N	MEAN	SOURCE OF VARIATION	DF	SS	MS	F
1 = Jul–Oct,	Female	3	1716,667 g	Treatments	5	8 394 100,000	1 678 800,000	14,051 **
2 = Nov–Feb,	Female	7	2921,429 g	Error	19	2 270 200,000	119 484,336	
3 = Mar–Jun,	Female	3	3100,000 g	Total	24	10 664 000,000		
4 = Jul–Oct,	Male	5	1830,000 g					
5 = Nov–Feb,	Male	4	3025,000 g					
6 = Mar–Jun,	Male	3	3150,000 g					

ORTHOGONAL CONTRASTS

CONTRAST		SS	F	PROB. OF GREATER F
1,2,3 vs. 4,5,6	(female vs. male)	99 510,256	0,8328	0,3729
4 vs. 5,6	(Jul–Oct males vs Nov–Jun males)	4 546 900,000	38,0542**	0,0000
5 vs. 6	(Nov–Feb males vs Mar–Jun males)	26 785,714	0,2242	0,6413
1 vs. 2,3	(Jul–Oct females vs. Nov–Jun females)	3 654 000,000	30,5815**	0,0000
2 vs. 3	(Nov–Feb females vs Mar–Jun females)	66 964,286	0,5604	0,4632

** Highly significant ($p < 0,01$)

Discussion

Dressing percentages of mountain reedbuck fit within the ranges of dressing percentages published by Ledger (1968) and von La Chevallerie (1970) for wild and domestic ungulates, but the position of the mean within the range varies with the season of collection at Loskop. The statistics presented in this paper were included to demonstrate that even with a small sample and the possibilities of bias inherent in small sample, the seasonal differences in masses and dressing percentages of mountain reedbuck collected at Loskop were unlikely to be attributable to change. Any commercial harvest of this species in an area with comparably "sour" grazing should therefore be limited to summer and autumn if maximization of meat yield is desired.

Mountain reedbuck have several attributes which make them desirable as meat producers. Venison from this antelope is highly palatable and at Loskop largely free of parasites. This species makes use of grazing in rough terrain that is unsuitable for farming and marginal for livestock production. The social structure and territorial behaviour of mountain reedbuck tend to spread the population over available habitat thus lessening chances of concentrations interfering with rotational grazing plans for livestock. Mountain reedbuck have a high reproductive potential even on poor quality rangeland. Twenty of the 24 adult females examined at Loskop were either pregnant, lactating, or pregnant and lactating. Of the remaining four, two were collected during the mating season, and one was carrying the remains of a resorbed fetus.

These advantages are balanced by several disadvantages. The "territorial male – small female group" social structure of this species spreads the population making hunting less efficient in terms of animals available for shooting per unit of hunting time than hunting animals which form herds. The overall distribution of mountain reedbuck is limited by the availability of suitable hilly or mountainous habitat. The rough terrain inhabited by mountain reedbuck makes hunting and carcass collection difficult. Current population levels are low in much of their range and could not support heavy commercial hunting pressure. Mountain reedbuck feed predominantly on grass and are potential competitors with cattle although habitat requirements, small size, and dispersed social organization limit this competition.

Mountain reedbuck have a potential as meat producers in mountainous areas, but their limited distribution and low overall densities would limit utilization to localized concentrations. The primary future use of mountain reedbuck will probably be limited to sport hunting where they are common and game viewing where they are rare.

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