

## CARCASS COMPOSITION OF MATURE MALE BLESBOK AND KUDU

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### OPSOMMING: KARKASSAMESTELLING VAN VOLWASSE MANLIKE BLESBOKKE EN KOEDOES

Data oor die karkassamestelling van volwasse manlike blesbokke en koedoes wat in twee Noord-Transvaalse natuurreserve geskiet is, word aangebied. Die gemiddelde lewende gewig van die 22 blesbokke en 18 koedoes in die studie gebruik was 73,4 kg en 236,3 kg, koue karkasopbrengs 52,9% en 56,6% en maervleisopbrengs 43,4% en 45,4% onderskeidelik. Beide spesies is meer produktief ten opsigte van hoë gehalte kleinhandelsnitte as plaasdiere.

### SUMMARY

Data on the carcass composition of mature male blesbok and kudu shot on two Northern Transvaal nature reserves are presented. The mean live weights of the 22 blesbok and 18 kudu examined were 73,4 kg and 236,3 kg, cold carcass yields 52,9% and 56,6% and lean meat yields 43,4% and 45,4% respectively. Both species were found to be more productive of high quality retail cuts and of lean meat than domestic stock.

Over the last decade a considerable amount of data has been collected on the carcass composition of African ungulates (see reviews by Talbot, Payne, Ledger, Verd-court and Talbot, 1965; Skinner, 1970; von La Chevallerie, 1970). Unfortunately, there has been a general lack of uniformity in the slaughter methods applied so that comparative reviews are difficult. At present, several workers in the Transvaal are using a standardized slaughter technique with the result that a comparative assessment of the meat production of our indigenous ungulates with that of farm animals will become possible.

The present account is based on mature male blesbok *Damaliscus dorcas phillipsi* and kudu *Tragelaphus s. strepsiceros* collected during control shooting on two Northern Transvaal nature reserves. The blesbok were shot on Percy Fyfe Nature Reserve (24°02 S, 29°09 E) which includes Sour Bushveld and Sourish Mixed Bushveld types (Acocks, 1953) and lies at 1300 to 1500 m altitude. Kudu were shot on Langjan Nature Reserve (22°50 S, 29°12 E) which comprises Arid Sweet Bushveld lying at 750 m above sea level.

### Procedure

#### Shooting

A total of 22 mature male blesbok and 18 kudu were shot during the period March 1969 to January 1970 (Table 1). Because a study on food habits was also being undertaken, the animals were shot during the main feeding periods, i.e. early morning and late afternoon. The animals were shot through the neck or thorax with high

velocity bullets and bled immediately. The weight of blood lost between shooting and weighing was noted and added to the latter weight to obtain live weight.

#### External offal

The following constituents of external offal were weighed: unskinned head, unskinned feet, hide and skinned tail.

#### Internal organs

The heart, lungs and trachea, liver, gall bladder, oesophagus and stomachs (full and empty), spleen and full intestines were removed and weighed as described by Ledger (1963).

#### Carcass analysis

The carcass analysis technique described by von La Chevallerie (personal communication, 1969) was followed. After removal of external offal the dressed carcass, with kidneys and kidney fat still attached, was weighed before cooling. The carcasses were then left to cool overnight or for at least eight hours. After re-weighing, the kidneys and kidney fat were removed and the carcass sawn medially through the vertebrae. The right side of the carcass was then divided into joints following the S.A. Meat Board's chart for retail mutton cuts (Figure 1).

### Results and Discussion

#### Age, weight and condition of material

An attempt was made to collect as uniform a series

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Table 1

Sample size and mean weight (kg) of mature male blesbok and kudu examined, March 1969 to January 1970

| Month          | III   | IV    | V | VI    | VII   | VIII | IX     | X     | XI    | XII | I     |
|----------------|-------|-------|---|-------|-------|------|--------|-------|-------|-----|-------|
| <b>Blesbok</b> |       |       |   |       |       |      |        |       |       |     |       |
| no. shot       | —     | 5     | — | —     | 6     | —    | —      | 5     | —     | —   | 6     |
| mean wt. kg    | —     | 70,7  | — | —     | 75,1  | —    | —      | 68,3  | —     | —   | 77,9  |
| S.E.           | —     | ± 2,7 | — | —     | ± 1,5 | —    | —      | ± 2,4 | —     | —   | ± 1,8 |
| <b>Kudu</b>    |       |       |   |       |       |      |        |       |       |     |       |
| no. shot       | 3     | —     | — | 3     | —     | —    | 4      | —     | 4     | —   | 4     |
| mean wt. kg    | 236,3 | —     | — | 262,7 | —     | —    | 250,5  | —     | 224,0 | —   | 213,2 |
| S.E.           | ± 3,9 | —     | — | ± 8,9 | —     | —    | ± 21,1 | —     | ± 2,3 | —   | ± 8,0 |

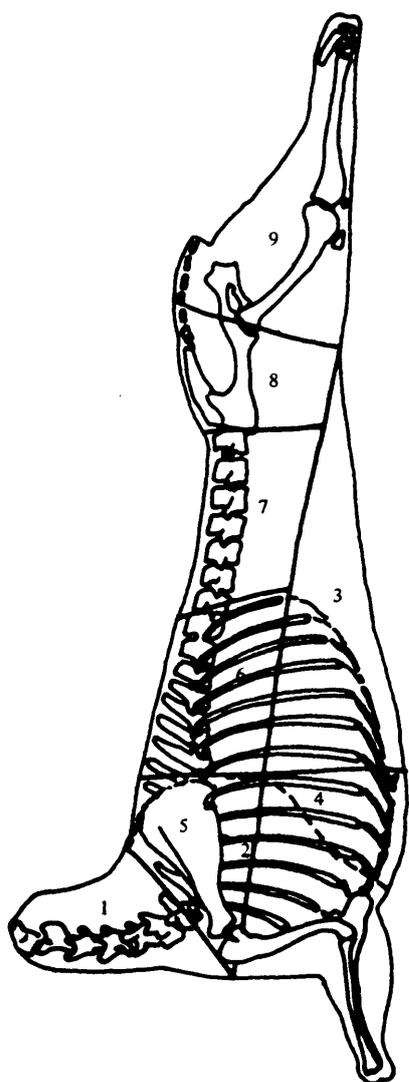


Fig. 1. — Chart indicating the retail mutton cuts recommended by the S.A. Meat Control Board and used in the carcass composition studies in blesbok and kudu. 1: neck; 2: shoulder; 3: flank; 4: breast; 5: thick rib; 6: rib; 7: loin; 8: rump; 9: buttock.

of animals as possible. Only mature males of three years and older were included in the data presented in the study. The mean live weights for 22 blesbok (73,4 kg) was somewhat higher than similar material from the Van Riebeeck Nature Reserve, Pretoria, where 20 mature males averaged 68,15 kg (Els, 1965). The kudu, at 236,3 kg were lighter than a mean of 257 kg for 57 males from Zambia (Wilson, 1965). The physical condition of both blesbok and kudu dropped considerably towards the end of the dry season (Huntley, 1971). However, this seasonal variation did not correspond with the pattern suggested by the live weight data given in Table 1.

#### Internal organs

Table 2 gives the weights of the internal organs examined. Far greater variation was found in the weights of internal organs than any other measurements, this being due to the inherent variability of organ size rather than inaccuracies in the study method.

#### Carcass dressing percentage

The gross carcass composition data are presented in Table 3. In this Table, the dressing percentage is expressed both in terms of the hot carcass, following Joubert (1969) and of the cold carcass, as recommended by van Zyl, von La Chevallerie & Skinner (1969). The difference in dressing percentage obtained by the two methods was only 1,4 and 1,8%, but this amounts to 2,6 and 3,2% of the cold dressed carcass weight of blesbok and kudu respectively.

The dressing percentage for kudu (56,8%) was very close to that for 32 month old Hereford x Afrikaner steers (56,0–56,4%) examined by Penzhorn and von La Chevallerie (1969) and falls within the range for the majority of African ungulates (55–61%) reviewed by von

Table 2

Weight, in kilograms, of the internal organs of animals examined in this study

| Measurement       | Blesbok |       |            | Kudu  |       |             |
|-------------------|---------|-------|------------|-------|-------|-------------|
|                   | mean    | S.E.  | range      | mean  | S.E.  | range       |
| Heart             | 0,56    | 0,20  | 0,40–0,79  | 1,28  | 0,04  | 0,98–1,44   |
| Liver             | 0,75    | 0,03  | 0,48–0,91  | 3,07  | 0,74  | 2,66–3,64   |
| Lungs and trachea | 1,15    | 0,04  | 0,91–1,41  | 2,85  | 0,11  | 2,14–3,77   |
| Spleen            | 0,24    | 0,03  | 0,12–0,30  | 0,53  | 0,33  | 0,35–0,73   |
| Kidneys           | 0,15    | 0,05  | 0,12–0,19  | 0,54  | 0,04  | 0,47–0,64   |
| Gall bladder      | 0,015   | 0,001 | 0,008–0,05 | 0,042 | 0,005 | 0,02–0,07   |
| Stomachs full     | 12,14   | 0,80  | 9,05–19,00 | 32,87 | 2,46  | 21,54–42,18 |
| Stomachs empty    | 1,61    | 0,09  | 0,86–1,89  | 4,14  | 0,60  | 3,30–6,37   |
| Stomach contents  | 10,53   | 0,78  | 7,03–17,02 | 28,73 | 2,21  | 18,36–35,88 |
| Intestines full   | 3,19    | 0,09  | 1,89–3,96  | 12,31 | 0,73  | 8,79–17,69  |

Table 3

Carcass composition of mature male blesbok, kudu and springbok

|           | n   | Live wt.<br>(kg) | expressed as a percentage of live weight |              |      |      |      |                     |         |
|-----------|-----|------------------|--|--------------|------|------|------|---------------------|---------|
|           |     |                  | hot carcass                              | cold carcass | skin | head | feet | ext. offal<br>total | viscera |
| Blesbok   | 22  | 73,4             | 54,3                                     | 52,9         | 6,22 | 6,60 | 2,08 | 19,90               | 16,80   |
| Kudu      | 18  | 236,3            | 58,4                                     | 56,6         | 5,62 | 6,72 | 2,31 | 14,65               | 15,40   |
| Springbok | 14* | 35,5             | –  | 57,9         | 5,32 | 6,14 | 2,27 | 13,73               | 20,66   |

\*From Van Zyl *et al.* 1970.

La Chevallerie (1970). That for blesbok (52,9%) was somewhat lower, but not as low as for Merino lambs (46,0) reported by van Zyl *et al.* (1969).

the buttock accounted for 29,2% of the carcass weight and in blesbok 25,6%.

#### Carcass conformation

Table 4 presents the results of the carcass composition study.

Unfortunately comparable data for domestic stock are rare in the literature, so it is difficult to assess the relative merits of blesbok and kudu against animals such as cattle, sheep and goats. In general however, the results are very similar to those described for springbok by von La Chevallerie & van Zyl (1971). These workers found that the flank and breast (low value cuts) of sheep accounted for 23,6% of the carcass weight, whereas in springbok, these cuts comprised only 10–12% of the carcass weight. In the present study, it was found that the same cuts in blesbok and kudu amounted to only 12,6% and 10,7% respectively.

A high quality cut, the buttock, comprised 29% of the mature springbok carcass compared with only 24,2% in sheep (von La Chevallerie & van Zyl, 1971). In kudu,

Table 4

Weight of carcass components in kg and as a percentage of the cold carcass weight

|                        | Blesbok |      | Kudu  |      |
|------------------------|---------|------|-------|------|
|                        | wt      | %    | wt    | %    |
| Number                 | 22      |      | 18    |      |
| Live weight            | 73,4    |      | 236,3 |      |
| Cold carcass           | 38,8    |      | 133,9 |      |
| Cold carcass yield (%) | 52,9    |      | 56,6  |      |
| Buttock                | 4,99    | 25,6 | 19,67 | 29,2 |
| Shoulder               | 3,62    | 18,6 | 11,67 | 17,4 |
| Neck                   | 2,59    | 13,4 | 8,99  | 13,4 |
| Loin and rump          | 2,59    | 13,4 | 9,49  | 14,2 |
| Flank                  | 1,37    | 7,1  | 3,88  | 5,8  |
| Breast                 | 1,07    | 5,5  | 3,26  | 4,9  |
| Thick rib              | 1,53    | 7,9  | 5,15  | 7,6  |
| Rib                    | 1,66    | 8,5  | 4,84  | 7,2  |

### Buttock composition

It has been shown (Butterfield, 1962) that the muscle, fat, gristle and bone composition of the buttock corresponds closely with that of the whole carcass. The data presented in Table 5 indicate the extremely low fat percentage and high muscle percentage of wild ungulates when compared with domestic species such as cattle which may comprise as much as 30% fat (Talbot *et al.*, 1965).

Table 5

### Buttock composition in mature male blesbok and kudu

|                      | Blesbok | Kudu  |
|----------------------|---------|-------|
| Weight, (kg)         | 4,99    | 19,67 |
| Length, (cm)         | 50,2    | 81,1  |
| Circumference (cm)   | 59,3    | 89,1  |
| Muscle (%)           | 82,0    | 80,3  |
| Fat (%)              | 1,4     | 1,3   |
| Bone and gristle (%) | 16,6    | 18,4  |

The lean meat yield of the blesbok buttock is somewhat higher than that of the kudu, possibly due to the former's superior muscle to bone ratio at constant fat content. Considering the live animal as a whole however, the kudu is more productive of lean meat due to its higher dressing percentage. Using the figures given in Tables 4 and 5 the estimated lean meat percentage of live animals would be 45,4% (107,3 kg) for kudu and 43,4% (31,7 kg) for blesbok. These figures are higher than that for nyala, 41,4% (Keep, 1971), but within the range of 41–46% for game animals given by Ledger (1963).

### Conclusions

Although the dressing percentages of blesbok and kudu did not differ much from those of domestic breeds,

the carcass composition was found to be more productive in terms of high value retail cuts and lean meat yield. The very low fat percentage of game animals is of interest with regard to their energy metabolism on natural pastures especially during periods of extended drought.

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