

GAME USE ON TWO KENYA RANCHES

**A Confidential Report to the Government of Kenya
By Wildlife Services Limited**

January 1973

**I.S.C. Parker & A.D. Graham
Wildlife Services Ltd
P.O. Box 30678
Nairobi,
Kenya**

GAME USE ON TWO KENYA RANCHES

**A Confidential Report to the Government of Kenya
By Wildlife Services Limited**

January 1973

25 copies of this report have been produced.

**3 presented to the Hon. Minister for Wildlife & Tourism
Through the Chief Game Warden.**

1 presented to Messrs, Arthur Cole Limited.

1 presented to Gianni limited.

20 retained by Wildlife Services Limited.

CONTENTS

| | <u>Page</u> |
|--------------|-------------|
| INTRODUCTION | 1 |
| METHODS | 2 |
| RESULTS | 9 |
| DISCUSSION | 20 |

INTRODUCTION

This report describes the commercial cropping of 820 Thomson's gazelle (*Gazella thomsoni* Gunther) and 638 impala (*Aepyceros melampus* Lichenstein) on the Kekopey ranch of Arthur Cole Ltd at Gilgil, and a further 500 Thomson's gazelle and 400 impala on the Suguroi estate of Gianni Ltd in Laikipia. The work on Kekopey took place between November 1971 and April 1972, including an initial week's experimenting and 3 two-week periods of full scale operation. The offtakes on Suguroi were taken in June and July 1972.

The purposes were to investigate the potential for game meat marketing in Kenya, and to establish techniques for cropping the two species concerned with particular regard to the attainment of hygiene standards as good as or better than those applying to the slaughter of domestic livestock. The work was carried out by Wildlife Services Ltd under contract to the estate owners. At the same time it was agreed with Government that the results of the work would be made available to the Ministry of Tourism and Wildlife.

The data presented herein are intended for limited Government circulation only.

METHODS

1. CONDITIONS

The following stipulations for the production of wild animal meats for human consumption were laid down by the Kenya Government's Veterinary and Game Departments in consultation with Wildlife Services Limited:

1. All carcasses were to be bled by severing the carotid arteries while the heart was still beating.
2. If killed by shooting, only head or upper neck wounds were permissible. Body wounds automatically meant condemnation owing to inadequate bleeding and the risk of contamination.
3. Evisceration to be within 60 minutes of slaughter. (Animals larger than gazelle and impala would be permitted less time. For example, steers in the Kenya Meat Commission must be eviscerated within 45 minutes of slaughter.)
4. Carcass bone temperature to fall below 13° C (55° F) within 4 hours of slaughter, and below 3° C (38° F) within 16 hours. The fall in temperature to be continuous with no temporary gains.
5. Processing of carcasses to take place in dust and fly-proof conditions.
6. Personnel handling skinned carcasses to be bathed and dressed in clean clothing, and to be free of disease or unhealed sores.

7. Facilities to be continuously available for carcass dressers and handlers to sterilise tools and hands
8. A minimum supply of 33 litres of sterilised (Chlorinated) water per carcass handled to be available.
9. Carcasses and viscera to be inspected by a qualified meat inspector of the Veterinary Department immediately following evisceration.
10. No unweaned immature animals to pass inspection.
11. Transport of carcasses passed fit for human consumption to be in dust-proof vehicles.

In addition to these Government stipulations the ranch owners demanded minimal disturbance of animals because the success of continued cropping would partly depend on a high degree of tameness.

The cropping team was also required by the distributing agencies to guarantee all carcasses the customary Islamic blessing to render them acceptable to Mohammedan consumers. In practice this religious rite (throat-cutting with incantations) coincided conveniently with hygiene-based bleeding.

2. SLAUGHTER

Except for 4 gazelle netted, all animals were killed by shooting at night during the dark phase of the moon. A "Mini Moke" vehicle, chosen for its cheapness and manoeuvrability carried a driver, gunman and Islamic meat blesser. On Suguroi estate the gunman also drove, reducing the team to two. On Suguroi this basic team was augmented by one to two additional teams. Animals were approached to within 30 – 70 metres, and dazzled with a 100-watt spotlight. They were then shot through the brain or neck. All animals on Kekopey were shot with a silenced .22 rifle firing standard velocity ammunition, chosen because the bullets travel below the speed of sound and cause minimal disturbance. On Suguroi the extra teams used unsilenced .22 rifles firing high velocity ammunition, and the Mini Moke team used a .22 Hornet rifle when working in thicker vegetation. This was to obtain flatter bullet trajectories, called for by the longer ranges, and was at the expense of quietness.

Night shooting was indicated to permit close approaches with minimal disturbance to other animals and to exploit the low ambient temperatures and the absence of flies. Immediately after shooting the carcasses were bled and blessed by the Mohammedan and loaded into the hunting car. Each carcass was tagged with a serial number. Selection was exercised in favour of adults and biased toward the larger individuals in any group. Not more than twenty

minutes after the first animal was shot the hunting car rendezvoused with a transport vehicle that took the carcasses for processing. Hunting and processing continued throughout the night with a target of up to 150 carcasses.

In an effort to speed up the slaughter rates netting was tried. A 500 metre nylon net (10 inch mesh) was suspended from a ranch fence and a herd of gazelle driven into it. Four animals were caught, but the carcasses were so badly bruised from the animals' struggles when enmeshed that they were condemned as unfit for sale. The technique was therefore abandoned.

3. PROCESSING

The processing complex consisted of a 35 metre overhead rail (No. 301-14 gauge Henderson Door Rail – a standard commercial commodity) along which carcasses moved, attached by meathooks to spreaders on bogies (Figure 1). The layout of the system is shown diagrammatically in Figure 2. A 10 cm. layer of wheat straw was laid on the working area under the rail to absorb blood spills and inhibit dust. This was burned and renewed daily. All workers showered before starting work and wore clean uniforms, aprons, caps and gumboots. Chlorinated water from a 9,000 litre tank was gravitated to taps at every station on the processing line. A bucket of boiling, disinfected water served every two stations for sterilising implements. The whole system was

lit by a 1 KVA generator.

Carcasses were hung from the hocks in the conventional slaughterhouse position. (Two sizes of hanger were used to cater for the difference in size between gazelle and impala.) At station 1 (fig. 2) the carcass was weighed and hooked up to a spreader by one hindleg that had been partially skinned. At station 2 the second hindleg was skinned and hooked up. At the same point the main skin cuts for removing the skins were made. At station 3 skins were pulled and flensed off, washed to remove dirt and blood and dropped into a tank of saturated saline solution (NaCl). At station 4 the sternum was split, and the head, metacarpals and metatarsals removed. At station 5 the carcasses were eviscerated, the viscera being dropped directly from the carcass into heavy-gauge polythene bags. The hearts, liver and lungs were kept separate from the other viscera. After inspection the hearts and livers were hung to cool, and the lungs and alimentary tracts discarded. At station 6 carcasses were inspected by the Government inspector and then pushed further down the rail to cool until ready for weighing and transporting to a commercial cold store in Nairobi (120 km from Kekopey and 200 km from Suguroi).

4. MARKETING

At the outset the Game Department stipulated that all sales of carcasses should be to or through the Kenya Meat Commission. The KMC itself had expressed willingness to undertake game meat marketing and was confident that it could be done. It was agreed with the KMC that the producer would sell carcasses at Sh 7.00 per kilo and charge a handling fee of Sh 0.60 per kilo. After December 1971 the KMC withdrew from this arrangement as it had been unable to sell all the carcasses then produced, and did not have storage space for future offtakes.

Permission was then granted for the producers to sell directly to meat wholesalers with the provision that the KMC still received a cess of Sh 0.10 per kilo sold.

Messrs Kenya Cold Storage Limited agreed to take all carcasses from Kekopey and Suguroi after the KMC withdrawal. Kenya Cold Storage undertook transport from the field into Nairobi, and provided cold storage and sales outlets. They paid the producers Sh 3.75 per kilo carcass weight for output from Kekopey, but lowered this to Sh 2.10 per kilo for all carcasses from Suguroi.

In addition to these local sales, Wildlife Services Ltd sought markets outside Kenya; though a certain amount of interest was shown from several sources, no orders were secured.

RESULTS

KEKOPEY

In 50 working nights spread over the dark phases of the moon in November and December 1971, and January and April 1972, 820 Thomson's gazelle and 638 impala were killed. The 50 night period included an 8 day experiment phase in which not more than 15 animals a night were taken. Including this experimental period, the nightly kill averaged 29.2 animals. The total carcass weight produced for sale was 22,000 kg, and the average dressed carcass weights were gazelle 10.40 kg and impala 25.77 kg. This offtake was below that authorised of 1,000 gazelle and 700 impala for two main reasons:

1. The terrain on Kekopey was unexpectedly rough making approaches to animals difficult and slow and thereby limiting the number that could be taken, and
2. The limit of 1 ton of carcasses that could be accepted nightly by Messrs. Kenya Cold Storage Limited.

Distribution of labour and typical times for task completion are summarised in Table 1. The time from slaughter to evisceration averaged 47.2 minutes (range 10 – 95). Those carcasses which exceeded the maximum time limit all passed inspection. The low nocturnal temperatures characteristic of the area

| Task | Men | Minutes to complete | |
|--|-----------|---------------------|------------|
| | | Impala | Gazelle |
| Unloading | 2 | 0.5 | 0.5 |
| Weighing | 2 | 0.5 | 0.5 |
| Initial skin cuts | 1 | 1.0 | 0.75 |
| Skinning | 2 | 3.5 | 1.5 |
| Sternum cutting, removal Lower limbs and head | 2 | 1.5 | 1.25 |
| Evisceration | 2 | 2.5 | 2.0 |
| Total | 11 | 9.5 | 6.5 |
| Government meat Inspection: | | | |
| Viscera | 1* | 1.5 | 1.5 |
| Carcasses | 1* | 1.5 | 1.5 |
| Combined total | 13 | 12.5 | 9.5 |

TABLE 1: Shows typical times for task completion on the “gralloch”.

Impala take longer owing to their larger size. Only 10 men are actually on duty owing to some overlap in tasks. In practice the dressers responded with shorter times to completion when presented with larger numbers of carcasses.

These men were not essential to the operation, but were supplied to assist the Government officers.

(nightly minima recorded during the project ranged from 3.3° - 12.2° C) resulted in carcass cooling within the stipulated limits.

Table 2 gives an analysis of condemnation rates for the first 1,156 animals taken on Kekopey. The remaining 302 animals are not expected to affect these results significantly. Condemnation from all causes totalled 3.3% of animals taken.

Of the 820 gazelle 53.2% were males. 46.8% females. Of the 638 impala 49.3% were males and 50.7% females.

SUGUROI

As Suguroi is twice as far from Nairobi as Kekopey is, and as the price per kilo carcass weight was much lower than at Kekopey (Sh 2.10 as against Sh 3.75), the cropping rate on Suguroi had to be raised. This in turn necessitated increased cold storage facilities in Nairobi to take up to 2 tons per night.

It was intended that the target crop of 900 animals should be taken in 7 hunting nights (130 per night) by increasing the number of hunting teams. In practice 10 days were needed, 6 in June and 4 in July. This was caused by

| CAUSE | IMPALA | | GAZELLE | | COMBINED | |
|----------------------------------|--------|------------|---------|------------|----------|------------|
| | No. | % of total | No. | % of total | No. | % of total |
| 1. Poor bleeding | - | - | 2 | 0.30 | 2 | 0.17 |
| 2. Cysticercosis | 9 | 1.85 | - | - | 9 | 0.78 |
| 3. Sarcocysts | 1 | 0.21 | - | - | 1 | 0.09 |
| 4. Wounds and septicaemia | 2 | 0.41 | 3 | 0.45 | 5 | 0.43 |
| 5. Contamination during handling | - | - | 1 | 0.15 | 1 | 0.09 |
| 6. Unweaned immatures | 1 | 0.21 | - | - | 1 | 0.09 |
| 7. Shot through body | 1 | 0.21 | 14 | 2.09 | 15 | 1.30 |
| 8. Bruising through netting | - | - | 4 | 0.60 | 4 | 0.35 |
| TOTALS | 14 | 2.89 | 24 | 3.59 | 38 | 3.30 |

TABLE 2: Shows the proportion and cause of condemnation in 487 impala and 669 Thomson's gazelle from Kekopey ranch.

the inability of the additional hunting teams in the June session to achieve a high enough kill rate (15.8 and 4.2 per night respectively against the Wildlife Services team average of 52.2). These teams were replaced by two other teams for the July session in which a combined average of 118 animals per night were taken. The poor results of June's additional teams arose from their inexperience and unsuitable vehicles. A total of 500 gazelle and 397 impala was increased by the slaughter of 4 unweaned impala found after the parent had been shot, and by the accidental cropping of 2 female reedbuck and 4 Grant's gazelle. The overall average rate of kill was 91 per night.

The total weight of carcasses sold was 13,162 kg. Dressed carcass weights averaged 9.7 kg (gazelle) and 22.5 kg (impala). These are slightly lower than those obtained at Kekopey. With the gazelle this difference is attributable to the lower proportion of males (35.6% males to 64.4% females) in the offtake, and with the impala it is suspected that the average age of animal taken was much lower than at Kekopey (the sex ratios being exactly 50% males and 50% females). Both reasons are believed attributable to the extensive shooting that is undertaken regularly on Suguroi.

The main camp and processing line at Suguroi had to be situated much further from the concentration areas of both gazelle and impala. This resulted

In longer times between slaughter and evisceration, which averaged 63 minutes. Some carcasses were not eviscerated for as long as 2 hours. Nevertheless no carcasses were condemned for this reason.

Similar nocturnal temperatures to those of Kekopey prevailed at Suguroi giving good carcass cooling.

Table 3 gives an analysis of condemnation rates for the animals taken on Suguroi. Condemnation for pathological conditions were similar to those on Kekopey (Suguroi 1.0%, Kekopey 1.3%), but rejections for body shots were higher on Suguroi (3% against 1.3%), and are believed to be a further result of using inexperienced teams.

MEAT INSPECTION

At the outset of the cropping on Kekopey it was agreed that all meat inspection should be carried out by staff of the Veterinary Department. In November and December 1971, and January 1972 inspection was undertaken by officials from the Kenya Meat Commission Factory at Athi River. After this the Veterinary Department refused to provide staff, claiming a lack of communication between themselves and the Game Department as the reason. This last minute refusal to provide inspectors caused the cancellation of

| CAUSE | IMPALA | | GAZELLE | | COMBINED | |
|----------------------------------|--------|------------|---------|------------|----------|------------|
| | No. | % of total | No. | % of total | No. | % of total |
| 1. Poor bleeding | - | - | - | - | - | - |
| 2. Cysticercosis | 6 | 1.50 | - | - | 6 | 0.66 |
| 3. Sarcocysts | 1 | 0.25 | - | - | 1 | 0.11 |
| 4. Wounds and septicaemia | 2 | 0.50 | - | - | 2 | 0.22 |
| 5. Contamination during handling | 1 | 0.25 | - | - | 1 | 0.11 |
| 6. Unweaned immatures | - | - | - | - | - | - |
| 7. Shot through body | 6 | 1.50 | 20 | 3.97 | 26 | 2.98 |
| TOTALS | 16 | 4.00 | 20 | 3.97 | 36 | 3.99 |

TABLE 3: Shows the proportion and cause of condemnation in 400 impala and 503 Thomson's gazelle from Suguroi ranch.

operations in March at considerable expense to the operators. As a stop-gap two Game department Veterinarians were seconded from the UNDP/FAO Kenya Wildlife Project, inconveniencing all parties.

MARKETING

All carcasses were disposed of at an average price of Sh 3.43 per kilo. Demand was poor despite a 6 month public relations campaign carried out by Messrs. Morgan Orr & Associates to promote the product. Hotels and restaurants reported little tourist interest in game meat contrary to expectations.

Overseas outlets in Ghana, Libya, Beirut, Abu Dhabi, Addis Ababa and Hong Kong were approached. Trial samples sent to Ghana were never acknowledged despite a professed interest in game meat. All other outlets approached showed interest, but being unfamiliar with the product were very cautious. It was apparent that personal contact with potential buyers was essential to establish sales. An approach to the Ministry of Tourism and Wildlife to sponsor a sales tour to the Arabian Gulf markets was turned down on the grounds that such sponsorship should come from the private sector. As Government has not given any long term contract to the private sector to develop the commercial aspects of wild life use, such as takes place being on

the basis of short term revocable permits or as with the subject of this report experimentally, the private sector was not prepared to invest in expensive sales trips whose costs would be recoverable only through long term operation. As a result no overseas sales were achieved.

Several buyers in Europe showed keen interest in buying Kenya game meats. However current veterinary regulations preclude the import of fresh meat into Europe from tropical Africa.

International airlines serving Nairobi were approached in the hope that they might serve game meat on their flights. Interest was expressed, but no orders placed. Small quantities of impala and gazelle meat were smoked, or made into pates and sausages by the NAS Butchery Ltd. These products proved popular as luxury items, but moved slowly on account of their very high prices.

Marketing was hampered by the limited cold storage space available in Nairobi.

All skins were sold to Messrs. Nairobi Hides and Skis Ltd. At Sh 35.00 per gazelle and Sh 40.00 per impala skin. A number of male gazelle and impala horns were sold to curio dealers in Nairobi at Sh 5.00 per gazelle horn and

Sh 5.00 per pair of impala horns.

FINANCIAL RESULTS

Table 4 gives a breakdown of costs and income from the combined Kekopey and Suguroi operations. The figures shown do not reveal all the financial outlay that was required to set up the cropping programmes. Much of the equipment and transport bought had a useful life in excess of the very short time taken by the experiment. It was therefore hired to the programme at set rates, the equipment (including the gralloch, knives, piping, electric wiring, uniforms etc.) at Sh 100.00 per day in the field, and the Mini Moke at Sh 1.00 per mile. The figures do not reveal the cost of time spent organising the operation as theoretically such expenditure is more rightly considered debitable to a much longer term commitment.

COSTS

| | | | |
|--|------------------|-----------------|----------------------|
| 1. Staff | a) Management | Sh 27,500.00 | |
| | b) Subordinate | 44,096.65 | |
| | c) Extra Hunters | <u>3,898.00</u> | Sh 75,494.65 |
| 2. Transport Hire | | | 30,264.60 |
| 3. Cropping equipment and tentage hire | | | 10,360.00 |
| 4. Aircraft use | | | 5,900.00 |
| 5. Expendable materials (salt, straw etc.) | | | 5,608.05 |
| 6. Fuels | | | 4,899.90 |
| 7. Administration | | | 3,113.40 |
| 8. Refrigeration hire (Kekopey operation only) | | | 2,773.10 |
| 9. Marketing and Publicity | | | 2,766.65 |
| 10. Game Department fees | | | 2,375.00 |
| 11. Ammunition | | | <u>1,745.00</u> |
| | Total | | <u>Sh 145,300.35</u> |

INCOME

| | | |
|--------------|-------|----------------------|
| 1. Carcasses | | Sh 120,672.53 |
| 2. Skins | | 87,165.00 |
| 3. Horns | | <u>2,755.00</u> |
| | Total | <u>Sh 210,592.53</u> |

EXCESS of Income over Costs = Sh 65,229.18
 =====

TABLE 4: Costs and Income from the combined Kekopey and Suguroi Cropping operations.

DISCUSSION

There were two major objectives to the programmes on Kekopey and Suguroi – to establish techniques for cropping Thomson's gazelle and impala (the most widespread, numerous and accessible game species on private land) and to investigate the potential market for game meat in Kenya. In that 2,358 antelope were cropped, their skins and 35 tons of dressed carcasses marketed and a profit of Sh 65,229.00 made, the experiment was a success. However, there are many qualifications to the achievement.

The work did establish workable cropping techniques for impala and gazelle. However they are not easily transferable, either to new situations or inexperienced operators. There are several reasons for this. Firstly certain aspects require high standards of proficiency. This was demonstrated by the comparatively poor kill rates achieved by all but one of the additional hunting teams used on Suguroi, despite the fact that all were experienced professional hunters. It illustrated the high degree of skill called for in this task.

Although a 12 man team processed over 100 carcasses a night, and could have handled many more, this was achieved by the exercise of considerable

skill. These men drew on 12 years' experience of various game cropping projects, worked long hours under exacting conditions and displayed high morale.

Although Thomson's gazelle and impala are accessible to commercially viable cropping, the production of carcasses and skins to acceptable standards set by the Kenya Government is, weight for weight, more difficult and expensive than it is for domestic stock. This is because wild animals are necessarily unpredictable in their movements, availability and condition. In addition cropping operations are at the mercy of adverse weather.

While the work described here has quite clearly set a base-line for development, it has demonstrated the need for more generally applicable techniques. Both on Kekopey and Suguroi, the management and existing ranch staff are quite capable of taking the number of animals cropped by Wildlife Services Ltd by themselves, although initially not with the same speed and precision. Had they done so in their own time, using the skins only as their source of revenue and disregarding meat production, their gross costs are unlikely to have exceeded Sh 10,000.00. Their income would have been Sh 77,165.00, greatly exceeding the Sh 32,614.59 they received after sharing the profit shown in table 4 with Wildlife Services Ltd. From the ranchers'

point of view the production of hygienic game meat by employing a team with the necessary expertise to do this reduced their potential income very substantially. Repetition of such an exercise would only be justified if either the price of meat increased very substantially, or they undertook the work on their own.

The sale of game meat encountered indifferent results. Demand for it was unexpectedly low, particularly from the luxury meat consumers. Reference to results of fresh or frozen game meat marketing in Tanzania, Zambia, Rhodesia and South Africa show similar outcomes, and the only recorded successes in this field appear in Uganda and around Kilimanjaro in Tanzania as anomalies. The general rejection of fresh game needs explanation before future extensive investment in marketing it is warranted.

Further obstacles to game meat production in Kenya arise from the shortage of cold storage space and International Veterinary restrictions on exports to Europe and America – the most obvious markets. Both of these will require extensive investment in equipment and research to overcome. This is unlikely to be forthcoming from the private sector of the economy so long as the individual does not have long term guarantees to be able to develop and manage wild life on his land in accordance with his own plans. For as long

As the Government denies the landowner ownership, or at least long term control of his wild life stock, it is unrealistic to expect the private sector to invest large sums of money in the provision of expensive equipment or research.

In view of the difficulties besetting the sale and production of wild life meat, various forms of processing warrant consideration. In Rhodesia and South Africa a good demand exists for high quality game biltong, making this a profitable form of game use. However demand for this is undeveloped north of the Zambezi. Meat could be canned for either human or pet consumption, but canning is not a cheap form of meat processing. Demand for canned meat is low in Africa, as demonstrated by the demand for corned beef from the KMC – only 0.5% of production being retained for Kenya consumption. There are possibilities for selling canned game meat in developed western countries, but these have yet to be explored. Current sentiment in several western countries is such that selling game meat for pets would be a risk. For example a major British pet beef manufacturer was forced to abandon the canning of horse and donkey meat for pets through public pressure. This could also arise with African game meat.

An alternative use for game carcasses is the production of carcass meal. Hitherto this has been scorned by wild life authorities – allegedly for low profitability – but we suspect deeper psychological reasons (“game”, with its connection with “royalty” being too good for a powdered stock food!) However, it should be pointed out that all carcasses can be converted into meat meal irrespective of type or origin. Minimal hygiene standards pertain to carcass handling prior to processing. Demand for carcass meals is rising both locally and internationally and prices are likewise increasing. If produced correctly there would be no barriers to the export elsewhere. The production of carcass meal deserves careful consideration by anyone interested in commercial game cropping. If foreign made carcass meal processing equipment is exorbitantly expensive, the possibility of designing and making such equipment locally should be entertained.

In conclusion, the results achieved on Kekopey and Suguroi are a technical success that has not been attained elsewhere. However, rather than prove a case for commercial game cropping, they illustrate the numerous problems that go with it. While giving grounds for optimism, they emphasise that we are only at the beginning of a long experimental period if the case is to be tested.