# A survey of Karakul sheep farmers in Southern Kalahari, Botswana: management practices and constraints to improving production

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## Abstract
Karakul sheep breed has a lot to offer to livestock production in many parts of Botswana. This breed of sheep is acclimatised to desert conditions, which prevail in most parts of Botswana. This breed produces a range of products *viz* meat, milk, fur/pelt and wool, allowing for diversification of farm produce hence reduced risks attached to the production of a single product. The Karakul breed has however, not spread to most parts of Botswana for reasons that are not obvious. There has been scanty research on production attributes and constraints to production faced by local farmers in Botswana. Therefore, the objective of this research was to administer a survey questionnaire to Karakul sheep farmers in order to document management practices farmers employ and also find out problems that they encounter in their production systems and then provide possible solutions. The results showed that on average the 10 interviewed Karakul farmers kept 214.3±196.7 Karakul sheep, 141.1±151.1 beef cattle, mainly Tswana-Brahman crosses and 183.8±68.5 goats, mainly Boer goat and Tswana-Boer goat crosses. Such farming strategy reduces risks attached to one enterprise due to market fluctuations and droughts, which are common in this part of the country. Karakul sheep farmers also keep donkeys, mules and horses that are a source of transport in this sandy part of Botswana. The majority of farmers practice free range grazing systems, supplementing their sheep when ever is necessary. The major constraints to efficient karakul production are lack of animal feeds during periods of scarcity, lack of market for pelts and meat, lack of skilled manpower, lack of capital and diseases. These constraints could be solved by the involvement of the government in aiding Karakul sheep farmers. Firstly, by establishing contacts and contracts with the wetter parts of the country, where feeds can be readily produced. Secondly, by providing skilled labour such as pelt sorters and graders. Thirdly, by providing a similar marketing strategy as for beef cattle and lastly encouraging disease research in Kalahari area. Provision of solution to the current production constraints would tremendously boost farmers production and their income hence leading to the goal of national food security, which has been advocated for sometime now.

**Key words** Karakul, sheep, Botswana

## Introduction
Karakul farming in Botswana is localised in the arid Southern Kalahari (Martins & Peters, 1992 a&b). Farming of this breed has many advantages since it can produce meat, pelt/fur, wool and milk (Devendra & McLeroy, 1982). The production of diverse products particular suits the climate of Botswana, which is predominantly arid (Field, 1970; Karikari, 1996). Furthermore, production of diverse products allows for flexibility as suggested by Nsoso & Madimabe (1999). Flexibility in farming operation is of tremendous importance where rainfall is unpredictable both in time and space.

The Karakul breed obviously thrives under the conditions of the Kalahari Desert. However, like any other farming venture, it is important to carry-out research on this breed and the production environment with the view to further improve production and also promote this breed in other parts of the country. Diverse genotypes in any production systems allow for flexibility in farm operation, which is ideal for Botswana farming conditions.

In Botswana research on Karakul production is very limited which may hinder improving production in this breed. Martins & Peters (1992a&b) looked at alternative use of Karakul sheep mainly concentrating on reproduction, growth and pelt production. Madimabe & Nsoso (1999) and Nsoso & Madimabe (1999) have reviewed work on Karakul research published in Botswana. These reviews have highlighted that there is no extensive research on this breed in Botswana despite the fact that it offers tremendous farming hope for drought prone parts of the country. Furthermore, all the work published so far has been science driven

without taking consideration of the farmers who are the major stakeholders. Therefore, the aim of this study was to survey Karakul sheep farmers in Southern Kalahari, covering Middlepits and Bokspits areas with the view to document management practices and identify constraints that hinder efficient Karakul production in Botswana from a farmer's point of view.

## Materials and Methods

A questionnaire was administered to Karakul farmers (n = 10 *i.e.* n = 3 in Middlepits and n = 7 in Bokspits) visited during a trip to Southern Kalahari in 1999. The farmers who were interviewed were selected with the help of Animal Health Production staff in each area. The selection criterion was to interview farmers who kept at least 25 pure breeding Karakul ewes.

The questionnaire basically covered the number of Karakul breed of sheep and other livestock species each farm kept, management practices/animal husbandry practices and constraints that farmers face in keeping Karakul sheep.

Due to similar responses obtained from Middlepits and Bokspits farmers, the results were jointly analysed using Procedure Frequency in Statistical Analysis System (SAS, 1999-2000).

## Results and Discussion

### Average number of animals

According to Table 1, Karakul sheep farmers on average also keep a large number of goats (mainly Boer goats or Tswana-Boer goat crosses) and cattle (mainly Tswana-Brahman crosses). This is a characteristic of most farmers in Botswana who keep a range of livestock animals (Mosimanyana, 1998). This diversified farming set up minimises risks attached to one product in the volatile livestock markets. Furthermore, the grazing habits of these species differs in that goats are predominantly browsers while sheep and cattle are grazers, hence farmers maximise the benefits from the rangeland.

Transport animals such as donkeys, horses and mules are also important in Southern Kalahari (Table 1). This is to be expected given that the country is sandy hence these animal species provided a ready and cheap source of transport. Farmers also crossbreed donkeys and horses to produce mules. Of concern is the higher numbers of donkeys than other transport animals' species. Ideally it would be advisable to reduce the number of donkeys to similar numbers to those of horses and mules to reduce land degradation and also competition with livestock species, which are worth more in terms of the saleable products.

The major products of Karakul sheep are pelts from lambs and meat from lambs not pelted and culled ewes. Lambs for pelt production are slaughtered within 24 hours after birth, which is consistent with other previous studies (*e.g.* Martin & Peters, 1992a). Failure to do that would lead to deterioration of curls of the pelt hence down grading of the pelt. Lambs for meat production are killed from 6 months onwards and culls are slaughtered after every selection stage.

Other products, which should be produced, are wool and milk for export markets.

**Table 1** The average number (± s.e.) of Karakul sheep and other livestock species kept by Karakul farmers in Southern Kalahari

| Variable | Mean |
|---|---|
| Karakul sheep | 214.3 ± 196.7 |
| Karakul rams | 7.0 ± 6.6 |
| Cattle | 141.1 ± 151.1 |
| Goats | 183.8 ± 68.5 |
| Donkey | 28.8 ± 19.5 |
| Mule | 0.6 ± 0.8 |
| Horses | 8.0 ± 4.7 |
| Poultry | 6.2 ± 7.5 |

**Source of karakul sheep**

Most of the farmers obtained their stock from sale (n = 7), with only a few having inherited them (n=3) from their relatives. This means that Karakul farmers can readily sell their animals. Nsoso & Madimabe (1999) suggested that Karakul sheep should be farmed all over Botswana. Such a scheme would provide a ready source of market for Karakul farmers.

**Management of Karakul sheep**

Most flocks were extensively grazed (n = 8) with supplementation with bone meal, salt and Rumivite during periods of feed scarcity. During grazing the animals are shepherded. The Kalahari ecosystem is fragile, therefore, stock should be prevented from overgrazing, which would lead to soil erosion and further marginalisation of the desert conditions that are characteristic of this ecosystem. The animals are kraaled at night. The source of water is borehole with animals watered once a day.

Lambs not pelted are castrated from birth up to six (6 ) months of age. Castration at birth to about two months involves using rubber ring method whereas at older ages *i.e.* three (3) months onwards, it involves using burdizzo or knife methods. Castration is carried out to control breeding.

Most farmers (n = 6) do not wean their lambs *i.e.* they let weaning happen naturally. The rest of the farmers wean their lambs from 4 – 6 months of age. Weaning for this group of farmers involves either separating lambs and their mothers to different paddocks for those who have fenced paddocks or separating lambs and their mothers and herding them separately for about 2 months for those farming in communal areas. Farmers should be advised to wean their lambs if they are to improve their animals production, since weaning allows ewes to regain lost condition faster and hence it should be possible to breed from them in a shorter time than ones under natural weaning.

**Reproductive performance of Karakul sheep**

All the farmers interviewed claimed that their ewes give birth to predominately singles with a few ewes giving birth to twins. However, none of the farmers could quantify the reproductive percentages of their flock. Therefore, although such statistics is useful, it is only partially informative. Martins & Peters (1992a) reported that the twinning percentage of Karakul ewes in this part of the country is approximately 41%. This means that this breed is highly productive given that it is kept under desert conditions. As suggested by Nsoso & Madimabe (1999) twinning trait should be further enhanced in this breed for two reasons. Firstly, to increase the number of lambs pelted hence increase farmers' income. Secondly, to prevent the ever-increasing number of ewes reared in Botswana because of their low lambing rate per ewe lambing season. As pointed above, a higher number of ewes would lead to a higher land degradation than a lower number of ewes in the fragile ecosystem of this area.

Most farmers reported that most of the ewes lambed twice a year. This is also desirable to increase the farmers income and allow for diversity as to whether to produce pelts, wool or meat.

**Diseases of Karakul sheep**

Internal parasites are a major concern in replacement lambs and those reared for meat production. Drenching with worm remedies in summer and spring, which are the seasons with highest incidence could lower their negative impact on productivity. In fact, most farmers routinely do this in summer and spring. The negative impact of parasites has also been reported as a major constraint to small stock production in other parts of Botswana (National Veterinary Reports, 1990-1996).

Important diseases of lambs, which are a concern to farmers are Nasal worms, Scabs, Diarrhoea and Blue wild beast eye disease.

Diseases of rams and ewes, which are a concern to farmers, are Pulpy Kidney disease, Gall sickness, Scalp lies and Blue wild beast eye disease.

The incidence of diseases both in the lambs and adult sheep are mostly seen in summer and spring. This means that farmers have to be on the outlook for these else they lose a lot of animals. To safeguard against internal parasites and diseases the majority of farmers frequently drench their animals with the worm remedies and also vaccinate against diseases.

**Major constraints to Karakul production**

The major constraints to efficient Karakul production all farmers face are lack of feeds, lack of market for pelts in Botswana, lack of capital, diseases and lack of skilled manpower in Botswana.

Livestock feeds are sold through Livestock Advisory Centres (LAC) and private companies in Botswana. It happens that in parts of the Kalahari droughts are frequent and during such periods it is difficult for farmers to get enough feeds. The solution is for farmers to venture into fodder production especially in parts of Kalahari where it's possible to do so. A further solution is to contract other farmers in wetter parts of the country like Chobe to grow hay for drier parts like Kalahari.

Farmers sell their pelts, which are the most valuable product of Karakul sheep to South Africa. A major complaint by farmers is that pelts are bought once a year (in June), therefore, they only receive one payment per year. Ideally farmers would like to see a situation like Botswana Meat Commission (BMC) where sales are held periodically throughout the year. Like beef farmers, Karakul sheep farmers would like to be paid 90% of the value of their products after a week or two with the balance being paid out at the end of the year or beginning of the following year. Tied to this farmers would like to see the government taking an active part in this trade by passing legislation which would enable training pelt sorters and graders here in Botswana, such that there is quality control. Pelts sent for export via South African should be of the best quality because at the moment all pelts irrespective of their quality are exported and in some instances the price paid for pelt does not even pay for the cost of transporting pelts from Botswana to South Africa. Therefore, sorting and classifying pelts here in Botswana would prevent such a costly venture to farmers.

Pelts of low quality could be further processed to add value to them before exporting as either semi finished or finished products or made into local goods such as horse saddles and winter clothing. Some of these goods can also be exported.

Sorting and grading pelts in Botswana and adopting BMC style of payment would provide farmers with a ready source of income and reduce their present complaint about lack of capital. Furthermore, promotion and farming of Karakul in other parts of Botswana would also provide a ready market for Karakul sheep, although this would be saturated after sometime.

Carrying out research in Kalahari areas and coming up with appropriate recommendations should solve disease problems.

**Characteristics of Karakul farmers**

The majority of farmers were male (n = 8) of 21 - 51+ years of age, with only a few being females (n=2) aged 49+years. All farmers had primary education with a few having Junior Certificate (n=2) qualification and one holding a Diploma qualification. This mean that these farmers can read and write hence they are in position of accessing technology in order to improve their farming enterprises. Furthermore, some of these farmers can be trained to be pelt sorters and graders using objective standards.

## Conclusions

Karakul sheep farmers in Southern Kalahari also keep cattle and goats, which diversifies their produce hence reduced risk attached to a single farming enterprise. Most Karakul farmers practice free range grazing system with supplementation when ever is necessary, routinely drench their animals for parasites and also vaccinate their animals for diseases. The major constraints to production are lack of feeds, lack of market of pelts in Botswana, lack of capital, lack of skilled labour and diseases. These constraints could be solved by government getting involved in this farming enterprise by providing contacts and contracts with fodder producing farmers in wetter parts of the country, providing similar markets, pay systems and capital similar to those currently provided to beef farmers. Carrying out research on diseases in Southern Kalahari could solve the last constraint.

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