

Technical Notes

The sheep industry in Botswana: promoting the Karakul sheep industry

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Introduction

The latest Botswana Agricultural Census Report (BACR) (1993) indicates that there are approximately 250 thousand sheep in Botswana. Ninety-three per cent of these sheep are found in traditional farms, while the rest are in commercial farms (BACR, 1993). The traditional farming system is practised on communal or tribal land where fencing is not allowed and thus no controlled breeding is possible. Commercial or freehold land is fenced thus controlled breeding is possible. Eight-four per cent of the sheep in Botswana are pure Tswana and its crosses, while the remaining 16% are Karakul and its crosses (Madimabe & Nsoso, 1998). There are also other sheep breeds, which are only important as ram breeds for crossbreeding with Tswana or Karakul. These are Dorper, Black Persian and Namaqua Africander.

The Tswana breed of sheep is found all over Botswana. It has a root fat tail. This breed is predominantly kept for meat production with occasional harvesting of skins. The coat is a mixture of hair and coarse wool (Devendra & McLeroy, 1982) but the wool is never harvested for sale.

The Karakul sheep is a native breed of the former Soviet republic of Uzbekistan (Devendra & McLeroy, 1982). This breed was introduced into Southern Africa early this century. In Botswana, this breed is localised in the Kalahari district (Martins & Peters, 1992a & b). The Karakul breed produces a range of products *viz* fur, milk (Devendra & McLeroy, 1982), carpet wool (Anon, 1998) and meat (Martins & Peters, 1992a). Therefore, this breed has a lot to offer as far as sheep production in Botswana is concerned.

As far as can be ascertained from published literature, there has never been a formal study where the production of Tswana and Karakul sheep breeds were compared. However, there exists work by the Animal Production and Range Research Unit (APRU) in Botswana for Tswana sheep (APRU, 1993). For Karakul sheep Martins & Peters (1992) published two extensive papers on this breed, Madimabe (1998) is in the process of publishing a manual for this breed and there is also a published work in Namibia for this breed (Anon, 1998). Most areas in Namibia where there is Karakul farming have similar climates to the parts of Botswana where this breed is farmed. Therefore, where there is no information on Karakul in Botswana to address the objective of this note, extrapolations will be made from these sources. The purpose of this note is to critically compare production attributes of the Karakul breed of sheep with those of Tswana sheep with the aim of promoting the former as a better breed than the latter for Botswana farming conditions.

The lambing percentage of the Karakul breed has been estimated to be 40% higher than that of the pure Tswana breed (Madimabe & Nsoso, 1998). This estimate was based on 1.41 ± 0.05 for Karakul (Martins & Peters, 1992a) and 1.01 lambs/per ewe lambing by APRU (1993) for the

Tswana breed. The extra lambs from Karakul can be pelted, raised for meat production and in the process shorn to produce wool. This means that the farmer has far more options with the Karakul breed than with Tswana. Therefore, a Karakul farmer is in a better position to plan farm operations than a Tswana sheep farmer.

An important question is, 'how much more income can a Karakul sheep farmer earn than a Tswana sheep farmer under the same farming conditions?' To answer this question a few assumptions will be made. Firstly, the average traditional farmer in Botswana keeps 12 sheep (BACR, 1993). Presumably most of these would be mixed age ewes and lambs since one ram per farm is adequate for breeding purposes. Some traditional farmers do not even keep any rams because rams of other farmers will serve ewes on heat during grazing since the land is communally owned and animals mix freely during the day.

Secondly, the mortality in Tswana lambs is 5.85, 10 and 15.95% from birth to weaning at 4 months of age, weaning at 4 months of age to 12 months of age and birth to 18 months, respectively (APRU, 1994), while in the Karakul breed lamb mortality is 21.2% at 2.4 months of age (Martins & Peters, 1992a). Mortality in Karakul lambs is only an issue for replacement stock but not for pelt producing lambs since the latter are killed within 48 h after birth, otherwise, the curl structure of the pelt deteriorates with increase in age (Martins & Peters, 1992b). For replacement stock what it means is that more than the required number of lambs should be kept. For example if the farmer needs four replacements, then he may keep six lambs knowing that about two may die from natural causes.

Thirdly, the average value of lamb pelt for the last eight years has been US\$8.25 (Anon, 1998). This is a conservative value but it is realistic given that the pelt industry went through a rough period when it was out-competed by mink, which represented 70% of all fur sales world-wide in the 1980s (Anon, 1998). Nowadays there is also competition from synthetics.

Fourthly, lambs for meat production are normally killed after 12 months of age, with the average weight of 26 kg (APRU, 1994) and an average price of US\$40.00. Fifthly, the average price of Karakul wool is about US\$0.30 per kilogram (Anon, 1998). Lastly, an average purebred Karakul ewe produces 3 kg of wool per year (Schoeman, pers. comm).

Results and Discussion

Using all the above information (also shown in Table 1) a traditional farmer who keeps 12 Tswana ewes produces 12 lambs a year. However, a Karakul farmer produces 17 lambs from 12 ewes (Table 1). About 16% of these lambs would die before 12 months of age (APRU, 1993), meaning that there will be 10 lambs left for sale for Tswana sheep and 14 for Karakul sheep. Assuming 10% of the lambs will be kept as replacement then the farmer has 9 and 13 lambs left for sale from Tswana and Karakul sheep respectively. These would bring in an income of US\$360.00 and US\$531.70 per year for Tswana and Karakul sheep farming respectively (Table 1). These figures should be discounted for costs of drenches, drugs and other production costs e.g supplements and costs of running boreholes. Such discounting is not possible at present because individual farmers do not document the costs of these items (Nsoso, 1998).

Karakul lambs are likely to grow faster than Tswana or Tswana crosses. Martins & Peters (1992a) reported that at five months of age Karakul lambs weighed between 24.8 ± 0.7 and 29.7 ± 0.7 kg irrespective of season of birth. Comparatively, Tswana sheep weighed between 22.8 and 30.4 kg at 12 months of age (APRU, 1994). It is worth noting that the two figures are from different ecological zones and also from different management regimes hence it is necessary to be cautious in comparing them. However, they serve to indicate that the growth rates of the two breeds are likely to be different with the Karakul having a faster growth rate. Faster growth rates are important to

Table 1 A comparison of products and income derived from Karakul and Tswana sheep farming based on a 12-ewe production system

Farming option	Product	Income (US\$)	
		Karakul	Tswana
1 [≡]	Lamb carcass @ US\$40.00 per head	13*40.00 = 520.00	9*40 = 360.00
	39 kg of wool @US\$0.30 per kg	11.70	—
Total income 1	—	US\$531.70	US\$360.00
2 ^A	17 pelts from spring lambing @US\$8.25 per skin	140.25	—
	7 pelts from autumn lambing @US\$8.25 per skin	57.75	—
	7 lambs for meat production at 12 months of age @ US\$40.00 per head	280.00	—
	39 kg of wool @US\$0.30 per kg	11.70	—
Total income 2	—	US\$489.70	—
3 [¶]	17 pelts from spring lambing @US\$8.25 per skin	140.25	—
	15 pelts from autumn lambing @US\$8.25 per skin	123.75	—
	39 kg of wool @US\$0.30 per kg	11.70	—
Total income 3	—	US\$275.70	—

≡ — Lambs sold after 12 months of age. Calculation for lambing percentage based on 101% for Tswana (APRU, 1993) and 141% for Karakul (Martins & Peters, 1992a). Mortality based on 15.95% (APRU, 1993) for the two breeds since there is no information on the Karakul. However, this may slightly over-estimate the meat income from Karakul since this breed will be less acclimatised to Botswana's conditions than the Tswana, which has been farmed here for hundreds of years. Therefore, the Karakul is likely to have higher mortality, which is indicated by higher mortality at 2.4 months for former breed (21.2% Martins & Peters, 1992a) than for Tswana at 4 months of age (10% APRU, 1993). An adult ewe is assumed to produce 3 kg of wool per year (Schoeman, pers. comm).

A — All spring born lambs slaughtered for pelt production. However, those from autumn only 43% slaughtered (Martins & Peters, 1992b). An adult ewe is assumed to produce 3 kg of wool per year (Schoeman, pers. comm).

¶ — All spring lambs slaughtered for pelt production and also all except 2 lambs from autumn lambing slaughtered for pelt production. The two lambs from autumn lambing are replacements but only one will be required. The other one may die from natural causes. An adult ewe is assumed to produce 3 kg of wool per year (Schoeman, pers. comm).

increase the profitability of a farming enterprise since the shorter it is the less the cost of production hence the higher the returns to a farmer. Thus if everything else is equal, Karakul lambs would reach market weight faster and they can be slaughtered earlier than Tswana lambs.

There is a second production option available from the Karakul breed, which is not available from Tswana sheep (Table 1). This option involves producing pelts, meat and wool. Under this option, a Karakul sheep farmer, would slaughter all lambs born in spring, which would bring income at no production costs for the lambs. The farmer would also shear ewes, which would produce 39 kg of wool (based on 12 ewes and one replacement). In addition the farmer would have a second lambing in autumn. From this second lambing, 43% of the lambs would be slaughtered for pelt production. The proportion of lambs pelted in autumn is that given for the Botswana Karakul industry by Martins & Peters (1992b). After 12 months there would be seven lambs left for sale. In total, this would bring in US\$489.70 (Table 1). This figure is slightly lower than that from producing Karakul for meat but higher than that of pure Tswana for meat production. Although this figure is lower than that of producing Karakul for meat only it has far more flexibility and diversity than

the former venture, which is good given that markets are quite volatile most of the time.

The third production option also not available from Tswana (Table 1), is that of producing pelts from both spring and autumn lambing and wool from ewes. The total income from this option is US\$275.70. This figure is also less than the income derived from meat in Tswana sheep farming (Table 2). However, this production option has more flexibility and diversity and an even flow of income throughout the year than the other two options.

The flexibility from farming Karakul sheep is important for farmers since they can have all their animals slaughtered for meat depending on the meat market situation and have additional income from wool from ewes which the Tswana sheep farmer can not do. Alternatively if the pelt market is lucrative, the farmer can slaughter most lambs for pelt production and leave replacements only, which the Tswana farmer cannot do. The higher lambing percentage of the Karakul is an added advantage to the system because more animals are available to allow for diversity, which is hardly possible with a Tswana farmer.

Diverse products reduce a farmer's risks tied to one product and also afford the farmer an even flow of cash throughout the year, which is important for operational reasons. This is possible because products will be marketed at different times of the year. In the final analysis, the Karakul farmer has many production options compared to the Tswana sheep farmer with only one. Therefore, the risk factors tied to one product are more reduced for the former than latter sheep farmer.

Farming Karakul throughout Botswana may take time because there is lack of high breeding value animals (Madimabe, 1998) and such animals could be very expensive to buy especially for traditional farmers who are resource poor. However, the problem of scarcity can be addressed as outlined by Madimabe & Nsoso (1998), which is by using artificial insemination and then upgrading crossbreds to Karakul.

Conclusions

A comparison between the relative gross returns of a Karakul sheep farming based industry and a traditional Tswana sheep farming based industry in Botswana shows that the former would bring in more income than the latter. Furthermore, the former industry offers many products *viz* fur, meat, milk and wool hence it allows for more flexibility and diversification in the farmer's choice of products and a more even flow of income throughout the year than the latter. Therefore, where possible, traditional Tswana sheep farmers from all over Botswana could change to the Karakul breed either as a pure breed where they are available or through upgrading where possible. It is also worth remembering that conserving pure Tswana sheep is important for future production and biodiversity. However, such efforts should be the responsibility of a national government and not resource poor private citizens who are struggling everyday to make ends meet in order to feed their families.

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Commercial ostrich farming in Botswana

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According to the returns to the Department of Animal Health and Production in December 1996 there were only 10 registered ostrich farms in Botswana with a total of 4305 ostriches kept. Ostriches of all ages were kept and the juveniles, 3 to 12 months formed the largest group at 38.4% followed by the breeding birds at 31.6%. The farms were widely distributed throughout the country and Lobatse district had the highest number with three ostrich farms. Most of the farms had less than 200 birds and there was only one farm with more than 1000 ostriches.

Introduction

The ostrich (*Struthio camelus*) is the largest living bird with an adult male standing at 2.5 m and may weigh up to 150 kg (Bruning & Dolensek, 1986). Domestication of ostriches was first attempted in the Cape Province of South Africa beginning in the 1860s (Huchzermeyer, 1994). Initially ostriches were kept for their feathers but are now kept for their meat and skins. There is a big demand for ostrich meat for it is low in fat and cholesterol (Shanawany, 1995). Commercial ostrich farming is currently found in South Africa, Israel, U.S.A., Australia, Canada, Zimbabwe and Namibia (Deeming & Ayres, 1994). Although Botswana has the highest number of wild ostriches, estimated by aerial surveying at 60,000 (Hallam, 1992), the ostrich industry has yet to be developed.

In this study the distribution of ostrich farms in Botswana with their flock composition is reported.

Materials and methods

Information on ostrich farming was obtained from the Department of Animal Health and Production of the Ministry of Agriculture, Gaborone, Botswana. All ostrich farmers are legally obliged to submit annual reports to this department. The data were utilised in computing the number of ostrich farms and the distribution per district. The number of ostriches kept and the flock composition was also determined.