

## Tswana Lambs Production under Communal Management In South Eastern Botswana

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**Abstract:** Lamb production in Botswana is not a very popular enterprise compared to cattle and goats' production. This paper describes Tswana lamb production under communal management in South eastern Botswana. The study was an on-farm research using the farmers' animals. Data was collected through the use of structured questionnaire based on reasons for keeping sheep, reproductive performance, constraints to sheep production and growth rates of lambs from birth till three months of age. Type of births of lambs was 95.12% singles and 4.88% twins with a sex ratio of 50:50 male: females. The average birth body weight of Tswana male lamb was 2.5 and 2.09 Kg for female lambs. Average body weight of lambs after 3 months was 7.15 Kg for males and 6.35 Kg for females. The average daily body weight gain (g/day) in the first 3 months after birth was 51.44±0.40 for males and 47.39±0.37 for females Tswana lambs raised under extensive management system. Production constraints are discussed in the text

**Key words:** Lamb production, birth body weight, average daily body weight gains

### Introduction

Sheep and goats are important sources of income and nutrition to many of the poorest rural population, many who own no cattle. Nearly 98.2% of sheep are located in traditional herds in Botswana (MoA, 1995). Sheep are kept mainly for meat and milk, but also hides are source of fat and protein and even used to pay bride price (MoA, 1995). In areas or regions where seasons of the year differ significantly in temperature, humidity and rainfall, there are seasonal variations in the amount and quality of pasture and on level of parasites (MoA, 1995). These variations affect sheep production. Extremes of temperature, level of nutrition and level of parasites infestation influence the survival and growth of lambs (MoA, 1995).

The agricultural statistic report shows that, 20% of 144440 farming households in Botswana keep sheep (MoA, 1995). The average number of sheep owned by each farming household was 14 which indicated that majority of farmers keep few sheep (MoA, 1995). On the other hand, 77% of sheep were in flocks of 40 or less. Female headed household owned 17% of sheep. It is estimated that there are 350000 sheep in Botswana (MoA, 1995). Birth rate was estimated as 35% of sheep and mortality rate was 17.2% (MoA, 1995). Nutrition represented one of the most serious limitations to livestock production in developing countries in the tropics. Diets based on crop residues and low digestible forage as it is the case in Botswana, have insufficient nutrients for the ruminant animal production (A.A. Aganga, 1999).

Diseases are critical constraints on sheep production in both developed and developing countries, e.g. enterotoxaemia and pastuerellosis give farmers problem especially in communal management (Aganga, *et al.*, 1997). Management of sheep in Botswana is mostly extensive with limited input in supplementary feeding, labour, treatment and disease control and also control of parasites. Therefore, output is also low.

Reproductive performance in sheep depends on breed type, nutrition and health status. Sheep productivity represents the combined effect of reproductive efficiency, growth rate, yield and quantity of desired final products (M.M.M. Ahmed, 1995). The reproductive performance depends on environmental factors, which are important in influencing seasonal patterns in reproduction. The most important is nutrition, which is influenced by forage availability and digestibility (C. Devendra and G.B. Mcleroy, 1982). Specific environmental factors might be classified as external or internal factors. The internal factors include the region in which the sheep are run and climate, which affect the animal itself, rather than the whole environment. The internal factors affect individuals but not the whole flock such as animal's sex, maternal effects and its reproductive status (C. Devendra and G.B. Mcleroy, 1982). Variability in gestation length has both genetic and environmental components. Prolific breeds generally have a shorter gestation length than non-prolific breeds. Some breeds can be bred throughout the year while some breeds have seasonal fluctuation in estrous activity (C. Devendra and G.B. Mcleroy, 1982).

Under practical conditions the best criterion of the growth performance of the fetus is the birth weight of the newborn lamb. The heavier and stronger lamb with its superior heat regulating mechanism was capable of extracting milk from its dam to maximum capacity and utilize available feed efficiently from earlier age (C. Devendra and G.B. Mcleroy, 1982). Typical growth rate is up to eight months in sheep. As the animals get older the rate of live weight gain decreases (R.T. Wilson, 1980). In 1983, it was stated that lambs average 2.0 ± 0.1 kg at birth and pre-weaning mortality is 15% and show growth resulting in 8.6 kg weaning weight, still limit overall productivity index to 11.0 ± 0.87 kg per ewe per year and annual reproductive rate to 1.4 lambs per ewe (S. Economides, 1983).

The economic loss to sheep production due to diseases and parasites as a result of mortality, loss of condition and

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inefficient utilization of feed and carcass condemnation is high (S. Economides, 1983). With increasing intensification of sheep production, the stress on the sheep's body defense is more marked. This stress is the result of the higher productivity of the animals, the unusual diets they are offered, the confinement of large numbers in small areas and in sanitary conditions.

Nutrition is identified as one of the most serious factors limiting small ruminant productivity throughout Africa but especially in arid and semi-arid areas. Even when there appears to be an adequate quantity of vegetation available, its nutrient content in terms of metabolizable energy, digestible protein and minerals may be poor (S.S. Hussain, 1996).

The lack of infrastructure particularly related to sale of animals is often cited as a constraint. Some causes of death in lambs during the first weeks of life are diseases such as pneumonia, starvation and diarrhoea. The survival rate of lambs can be increased when healthy ewes and rams are used in breeding program. Nematode infection of gastrointestinal tract is one of the major causes of wastage and decreased productivity in the sheep industry (Aganga, *et al.*, 1997). Little attention has been given to improving small sheep production methods. This study is conducted to document current status of sheep production with more emphasis on the growth rate of their lambs.

### Materials and Methods

The study was conducted at Metsemotlhabe and Gakutwe (kweneng district) and Radiajang and Matebele (kgatleng district) in the eastern Botswana during June 2001 to September 2001 for 120 days. Twenty representative respondent farmers were selected out of 85 farmers, which were previously involved in a survey and 10 farmers were selected from each study area. Data was collected through the use of structured questionnaire, which was administered in local and English language where necessary. The questionnaire was based on reasons for keeping sheep, milk utilization, reproductive performance, constraints to sheep production, number of sheep and number of lambs possessed by each farmer and general management of sheep by the respondent farmers. The sheep were physically counted and individual weighing of lambs were carried out. Biweekly live weights of lambs were obtained using a mobile weighing scale. The data was analyzed using descriptive analysis and T-test for the difference in live weights of the lambs from the two districts studied.

### Results

The survey covered 286 sheep consisting of 226 females and 58 males (46 castrates and 12 intact males). The data collected from the survey showed that there were 15 sheep per farmer on average. The flock was 79.02% females, 16.08% castrates and 4.20% intact males. Single lambs constituted 95.12% and twins constituted the remaining

Table 1: Average daily gains of lambs in grams/day

Birth weight of males (kg)	weight of male lambs after 3 months (kg)	Average daily gains (grams/day)	Birth weight of females (kg)	Weight of females after 3 months (kg)	Average daily gains of females (grams/day)
3	9	66.67	2.20	6	42.22
2.5	8	61.11	2.10	6	43.33
2.5	7	50.00	1.80	5	35.56
2.0	6	44.44	1.90	6	45.56
2.6	7	48.89	2.00	7	55.56
2.5	7	50.00	2.20	7	53.33
2.9	8	56.67	1.90	6	45.56
2.8	8	57.77	2.10	6	43.33
2.2	6	42.22	2.40	7	51.11
2.7	7	42.22	2.60	8	60.00
2.2	6	42.22	2.00	6	44.44
2.3	7	52.22	2.70	8	58.89
2.6	7	48.89	1.70	5	36.67
2.7	8	58.89	1.90	6	45.56
2.5	7	50.00	2.00	6	44.44
2.4	6	40.00	1.70	6	47.78
2.2	6	42.22	1.90	6	45.56
2.5	8	61.11	2.10	7	54.44
2.8	9	68.89	2.40	7	51.11
2.0	6	44.44	2.10	6	43.33
Averages					
2.50±0.2	7.15±0.45	51.44±0.40	02.09±0.36	06.35±0.35	47.389±0.37

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4.88%. The main reasons for keeping sheep in the two districts according to the respondent farmers included security against crop failure (30%), slaughtering during social ceremonies (20%), sheep were also used for payment of bride prices (14%) castrated males mostly were sold to butcheries and individuals to get income (15%), slaughtering for meat consumption in home was 15%, very small number of sheep owners also kept sheep for milk production (2%) and about 4% used sheep for gifts.

Pre-weaning mortality of lambs in Kweneng and Kgatleng districts was not a prevailing problem since only two lambs died in Kweneng and one in Kgatleng out of a total number of 46 and 36 lambs, respectively. Therefore, 3.66% of lambs died before weaning. According to the owners, disease accounted for all deaths of lambs. The breeding ratio of ram to that of sheep was 1:22 in Kgatleng and 1:19 in Kweneng.

The average birth weight for males and females (Table 1) were 2.50 kg and 2.09 kg, respectively. The male lambs were 0.41 kg heavier than the females on average. After about 90 days live weight of male lambs was 7.15 kg and females had an average weight of 6.35 kg. Therefore, the difference in live body weight between males and females was 0.8 kg which was not significantly different ( $p > 0.05$ ). The males gained about 51.44 grams on average per day and females gained about 47.37 grams per day on average. Male lamb gained about 4.05 grams heavier than a female lamb on average. The male and female mean live weight on average in Kweneng were 7.0<sup>0</sup>.45 kg and 6.3<sup>0</sup>.35 kg.

## Discussion

The total number of lambs which were weighed during the study in the two districts was 82 made up 78 lambs born as singles and 4 born as twins which indicated that Tswana sheep had low twinning rate. The percentage for female lambs was 48.75% and 51.22% of male lambs which is almost 1:1 sex ratio. An average of 4.0 lambs produced per farmer. The birth body weight of a Tswana lamb was similar to those reported in 1983 which was 2.0 $\pm$ 0.51 kg at birth (S. Economides, 1983). The average daily gains of Tswana male lambs was similar to that of the female lambs before puberty. Sheep reproductivity represents the combined effect of reproductive efficiency, growth rate, yield and quantity of desired final products (M.M.M. Agmed, 1995). Pre-weaning mortality of lambs was very insignificant with 3.7%. Lamb survival depends on mothering instinct, mothering ability, ability to resist diseases and parasites and level of management (MoA, 1995). The reproductive performance is influenced by ewe fertility and the incidence of multiple birth (MoA, 1995). The cause of mortality was diseases and the cases were reported to veterinary personnel before the lambs' death.

Farmers in Kgatleng and Kweneng districts reported that the most prevailing problems encountered was parasites which were listed by all the respondent farmers. The most common external parasites mentioned were ticks. Diseases were listed by 80% of the respondents. This was possibly due to absence of disease prevention and control measures enforced for sheep as it is the case with cattle in Botswana. Feed availability was stated by 50% of the respondents as limiting factor in sheep production. Capital played a very important role in sheep farming which needs some resources in terms of capital and therefore resource poor farmers could not afford to provide supplementary feeds to their sheep. Labour was also mentioned as a constraint since there were no animal attendants to assist the aging farmers. Though the farmers mentioned other causes of death like predators and snake poisoning, the farmers said the most prominent problem was diseases. Low quality and inadequate quantity of feed make sheep more susceptible to diseases and it leads to reduction in growth rate, reproductive capacity and low survival rate (S.S. Hussain, 1996). The farmers were aware of the need to vaccinate their sheep against pasteurellosis and enterotoxaemia and also to treat animal for internal and external parasites. Despite this awareness most of the farmers neither vaccinated their sheep nor treated them for parasites. During this survey, most adult sheep were infested with ticks thus; farmers were advised to dip or spray their animals. Sheep plays a significant role in the life of people in the districts since farmers gave multiple reasons why they kept sheep. The main reasons given for keeping sheep were protection against crop future (30%) and hence acted as the owners' security. The other important reasons are that sheep are used for ceremonies and for home consumption as mutton.

## Conclusion

Pre-weaning mortality was very low. Farmers in Kgatleng and Kweneng districts of Botswana experienced production constraints such as diseases, unavailability of feed, labour shortage, parasites infestation and lack of adequate capital which impaired lamb production. Farmers keep sheep mainly for meat production, sale to get cash income, security against crop failure, payment for bride price, gifts and dowry and slaughter during social ceremonies. The Tswana sheep is the predominant sheep breed in the two district and the breed is indigenous to Botswana. There is a need to promote sheep production in Botswana since currently, it is limited compared to cattle and goat production.

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