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Production and reproduction characteristics of South African indigenous goats in communal farming systems

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Abstract

South African indigenous does in rural communal farming systems kid for the first time at approximately 17 to 18 months of age. Does conceive at a relatively low body condition score (BCS ≈ 2.5 to 3) and their average litter size is 1.7 kids per doe. The average kidding interval was approximately 238 days and the highest kidding rates were attained in autumn (96%), followed by spring (93%), winter (63%) and summer (0%). The mortality rates in goats in communal systems were extremely high (40.6%) compared to systems with better management (<5%). The mortality rates result from theft, poor hygiene and predation. Breeding is not controlled and occurs all year round, which creates managerial problems.

Keywords: Indigenous goats, communal farming systems, productivity
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Introduction

Livestock production is the most important agricultural activity in most of the countries in southern Africa. The breeding strategies followed in southern Africa generally depend on the environment and level of management. As far as the environment is concerned, livestock production is often practiced under unstable and hazardous production conditions, and further threatened by bush encroachment or desertification. Producers vary from sophisticated commercial to communal subsistence producers (Braker *et al.*, 2002).

The role of goats in the traditional areas has been recognised (Devendra & Burns, 1970; Devendra & McLeroy, 1980; Wilson, 1988; 1989). Goats, like cattle, play an important role in the livelihood of rural people in communal farming systems. Indigenous goats are more common in the communal areas, while Boer goats are mostly found on commercially owned farms. Indigenous goats constitute a valuable genetic resource because of their ability to adapt to harsh climatic conditions, to better utilize the limited and often poor quality feed resources and their natural resistance to a range of diseases such as pulpy kidney, gall sickness and internal parasites. Goats thus play an important socio–economic role in rural areas, which includes some of the most resource poor farmers in Africa. These animals are prolific and require low inputs for a moderate level of production, reach maturity early and are profitable to keep (Devendra & Burns, 1970).

Although there is now a considerable body of published research on indigenous types of small ruminants in tropical areas of Africa, much of the work published has the disadvantage of having been carried out under controlled conditions at research stations. Consequently, results are often not applicable to communal production systems in rural areas. The aim of this research was to study the fertility status and performance of goats indigenous to South Africa in communal production systems in order to recommend strategies for improved production.

Materials and Methods

This study was conducted in the Moutsi district of Mpumalanga, 25°27` S and 30°58` E. This is a rural area and the agricultural pressure on the land is very high. Small ruminants are enclosed and tethered in a wooden hut during the night and are only allowed to graze and browse during the day under the supervision of a herdsman, particularly young men or women. The seasonal characteristics of the area are summer (October – January), winter (May – July), autumn (February – April) and spring (August – September). Forty goat farmers were randomly selected from seven villages and farms with between 4 to 156 goats were monitored (297 goats in total) from February 1997 to November 1997. Each herd was visited monthly and

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the reproductive characteristics, growth performance and mortality rates were recorded. At the onset of the study all animals were weighed and aged by dentition. Growth performance and estimates of age at first kidding were only recorded for animals with a known birth date. Weaning was assumed to occur at 150 days (Devendra & McLeroy, 1980; Wilson, 1983). The effects of season and production system on production and reproduction data were analysed using the Proc GLM procedure of SAS (SAS, 1991).

Results and Discussion

Prestige and status were terms used in a derogatory manner to describe the behaviour of traditional ownership in relation to their animals. The reasons for keeping livestock are rational and are related to their particular needs in the long or short term. This is supported by the age and sex structure of the flocks. In rural areas, goats are generally more important than sheep for sacrificial purposes. Nevertheless, goats and sheep do not arouse the same emotions as cattle in rural people (Hunter, 1936). Despite the major objectives of keeping goats, there is always a predominance of does in the flock, while minor differences in sex and age structure are maintained. All animals in the flock are productive, whether production consist of giving birth to young, producing milk or simply the process of growth to a size at which another product becomes the principal one.

The major management practice used to obtain stability of structure is the selling or slaughtering of bucks not required for other production functions, for home consumption and/or performance of rituals. Usually one or two bucks are retained in the flock for reproduction. Animal production systems in Mpumalanga are traditional and the households are generally dependent on livestock production for an income or food supply and crop production is often associated with livestock production. Daily movement of livestock from home to the grazing fields is recognised as an important aspect of management within the system. The enclosing of livestock in huts or kraals is done mainly to protect them from theft and predation.

In many African countries culture dictates that women are subordinates to men and hence are socially marginalized (Braker *et al*., 2002). Women own goats but they are often not allowed to sell goats in the absence of their husbands, who generally work as migrant labourers. The various decision-making levels related to goat ownership in Mpumalanga depict a conspicuous gender imbalance, which is a product of strong cultural background biased against women. Nevertheless, goats are generally more prolific and easier to manage than sheep for people with little animal experience. Goats forage more widely and on a greater variety of foods, they survive the seasonal droughts due to their ability to browse and are quite prolific under these extensive conditions. Although not reflected by official statistics, it is probable that the number of goats kept by the rural people has increased markedly in the last few years. The ownership of goats bestows prestige and they have a place in local custom and religion.

The annual reproductive rate is a composite parameter that does not appear to be utilised as much as it should be (Wilson, 1989). The total number of young per breeding female per year has been calculated as the size of the litter and the number of days in a year divided by the kidding interval, i.e. litter size x 365 / kidding interval. The annual reproductive rate of indigenous does increases with age and peaks at 3 to 4 years of age, remains stable and then starts to decrease (Table 1).

Goats are the most prolific of all domesticated ruminants under tropical and subtropical conditions and certain goats are able to breed throughout the year (Hofmeyr *et al.*, 1965; Devendra & Burns, 1970; Casey & Van Niekerk, 1988; Greyling, 1988). Indigenous goats in Mpumalanga breed throughout the year with the highest kidding rate recorded in autumn, which indicates a summer breeding season that coincides with optimum feed availability. The length of the breeding season is primarily the result of genetic and environmental interactions (Casey & Van Niekerk, 1988) with the environment playing a major role. Tropical goats reportedly exhibit poly-oestrous all year round, but it is known that environmental factors other than photoperiod, e.g., availability of feed and variations in rainfall, temperature and humidity, may affect the breeding season of goats (Amoah *et al.*, 1996).

The gestation length for indigenous goats in Mpumalanga varied between 145 to 148 days, which agrees with that reported for Boer goat does (Greyling, 1988). A gestation period of 149 days is normal in does (Shelton, 1978), with variations between 144 and 151 days. It was not possible to quantify the effect of the weight of the kids, type of birth (single or twins) or type of diet on the gestation length in the present study.

Similar to Boer goat does (Casey & Van Niekerk, 1988; Greyling, 1988), the indigenous goats in Mpumalanga are early breeders, reaching puberty at 6 to 7 months of age. The age at first kidding varied

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between 16 to 18 months of age, which is similar to West African Dwarf goats in Chad, but longer than the Togo (15 months), Sahel (13 months) and Maradi goats (14 months) (Wilson *et al*., 1989) and West African Dwarf goats in Nigeria (Ikwaegbu *et al.*, 1995). Age at first kidding of South African indigenous goats is shorter than that reported for Rwandan goats (21 Months, Wilson *et al*., 1989). Average litter size was 1.7, and 76% of the births that occurred in autumn and spring were twins, while only 24% of the births in winter were twins (Table 1).

Table 1 Effect of season and age on the prolificacy of indigenous South African goats (n = 297)

Season	Single birth	Twin birth	Proportion of total
Autumn	4%	96%	54%
Winter	68%	32%	24%
Spring	7%	93%	22%
Summer	0%	0%	0%

Age (years)	Prolificacy
2.5	56.1 - 77.3%
3.5	7.3 - 98.2%
4.5	133.4 - 183.7%
5.5	106.2 - 146.3%

The average kidding interval of indigenous goats in Mpumalanga was 258 days (n = 297), which is slightly shorter than that of West African Dwarf goats or goats from other parts of Africa (Wilson, 1989; Odubute *et al*., 1992). Ikwuegbu *et al*. (1995) also reported a kidding interval of 250 days for West African Dwarf goats in Southern Nigeria. Apparently these shorter kidding intervals are more common in traditional systems where uncontrolled breeding is practiced. Does in Mpumalanga often kid three times in two years which agrees with the findings of Mack (1983). The-kidding pattern of indigenous goats also suggests that they are most prolific at about four years of age (Table 1).

Mortality rates of goats in Mpumalanga ranged between 3.8 and 40.1%. Similar mortality rates were reported for goats in other parts of Africa (Devendra & Burns, 1970; Bembridge, 1989; Wilson, 1989; Ikwuegbu *et al*., 1995; Manjeli *et al.*, 1996). Unlike the West African Dwarf goats where stillbirths or abortions constituted the major cause of mortalities, mortalities of indigenous goats were mainly due to theft, predation and coccidiosis due to poor hygiene. These causes of mortality can be controlled if proper management practices are implemented.

It appears that the potential productivity of goats is constrained by a poor understanding of the value of goats and of strategies for improved natural resource management in target environments. False perceptions about environmental degradation, biases, inadequate official support and resources are probably the major constraints that detract from sustainable goat production. Until recently, in southern Africa there has been an official bias against the goat as destroyer of vegetation. Because of this prejudice, efforts to exploit the full potential of this animal have been generally minimal, compared to efforts in sheep and cattle (Bembridge, 1988).

Indigenous goats have a considerable potential provided that proper management is employed and that their potential in terms of valuable and productive small stock is recognised.

Conclusion

The current reproduction status of communal goat does is low, mainly due to high kid mortalities and inbreeding. In traditional livestock management, does and bucks run together all year round. Usually one or two bucks are left in the herd for up to five years resulting in inbreeding. The genetic resource of indigenous goats is therefore at risk if no effort is made to improve the management of goats in communal farming systems. Research and development efforts can significantly improve production from goats and simultaneously enhance the livelihood of the poor. In the search for efficiency and the maximum use of

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available animal genetic resources, more enlightened thinking is necessary about the role that the goat can play.

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