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Traditional Goat Production and Utilisation of Goat Milk in Kgatleng and Kweneng districts of Botswana

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Abstract

Botswana, with an estimatd goat population of 1.83 million has inadequate milk production. This study describes milk production and utilisation of free grazing Tswana does. A survey of 100 randomly selected farming households which keep goats was conducted in Kgatleng and kweneng districts. Sixty percent (60%) of the respondent farmers were male farmers and 40% were female farmers. Data acquisition was done through questionnaires, interviews and direct goat observations. The total goat population was 1769 composed of 1319 female goats, 362 kids and 88 male goats. The average herd size per household was 17.69 whereas the averages for female goats and kids were 13.19 and 3.62 respectively.

Ninety-five percent of the farmers kept their goats extensively and only 5% practiced semi-intensive system. Goat kept extensively were grazed and browsed for 8 hours daily on natural ranges, while those kept semi-intensively were browsed and grazed for 4 hours. Thirty-four percent of the farmers stored crop residues from maize, sorghum and beans for supplementary feeding during the dry season. Goat milk was mostly used for tea, direct drinking and consuming with porridge. The main diseases reported were diarrhoea, helminthiasis and pneumonia. The major constraint was non-availability of feeds which accounted for 85% of all the production constraints encountered by the goat farmers.

1 Introduction

Goats have for a long time played an important role in the livelihood of rural African people and still constitute a valuable source of supply of milk for families who are unable to keep cattle. Goats can be sustained in altitudes and on grazing lands where cattle and sheep cannot survive and where they are able to produce limited amounts of milk in excess of the needs of their offspring. Botswana's goat population is estimated to be about one million, eight hundred and thirty seven thousand and seven hundred (1,837, 700) of which over 98.46% are under extensive management in the hands of traditional small scale farmers (MoA 1993). Aganga et. al (1996) reported available ge-

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netic resources, ecology and production potential of goats in South eastern Botswana. Goats' milk, like cows', milk is a complete diet on its own since it contains protein, fat and minerals. Subsistence families in rural areas with goats can therefore prevent malnutrition if they use milk from their milking does because of its nature as a complete diet. Local Tswana does normally produce a substantial amount of milk in the beginning of the rainy season when majority of the cows have not yet started calving hence providing food to subsist farming families. In rural areas goats' milk is usually used for making sour milk known as "madila" as well as for soft porridge and making tea. Some families in rural areas used it for preparation of traditional medicine. The main objective of this paper is to describe traditional goat management system with specific focus on goats' milk production and utilisation.

2 Materials and method

The data used in this study come from a random sample of one hundred goat farmers in fourteen villages in Kgatleng and Kweneng districts. A structured questionnaire was used to obtain the data through personal interviews and direct observations of the goats' herd. The interviews were conducted between January and March 1997. Information on various aspects of traditional goat production and goat milk utilisation was collected from the selected households. The main respondents were always the heads of households, although, assistance was, at times, sought in answering appropriate questions from other household members.

The study area is located in the South-eastern part of Botswana. The selected villages are within a 20 - 80km radius from Gaborone, the capital of Botswana. Information gathered related to the following: goat herd size, number of does/nannies, reproductive performance, crop residues fed to goats, husbandry techniques, water source, frequency of watering, disease occurrence, milk production and utilisation. A one litre measuring cylinder was used to measure the amount of milk produced per doe on goat farms where farmers milk their does. Information obtained from the respondent farmers was collated by comparing data for gender differences in male headed households with female respondent farmers using T - test (STEEL AND TORRIE 1980).

3 Results and discussion

3.1 Characteristics of sample goat herd

Data obtained from the survey (Table 1) showed that 45% of the respondent farmers kept 1 - 10 goats and only one farmer kept over sixty goats. A total of 374 does kidded prior to the commencement of this study on the evaluated farms with 131, 101 and 142 does kidding within 30, 60 and 90 days respectively. On average each respondent farmer had 13 females goats out of which 2 were pregnant and 3 were lactating. The lactating does were few therefore milk production per farm was lower than expected. This indicated that there is a great chance of improvement in Tswana goats' milk production by planned breeding to encourage all nannies to kid within a short period.

Table 1: Herd size and composition in the surveyed areas

Parameters	Values
Number of goat farmers interviewed	100
Total goat population	1769
Average Herd size/farm	17.69 + 13.81
Range of goat population	2 - 63
Total number of female goats	1319
Average number of female goats/farm	13.19 + 9.75
Range of female goats on farms evaluated	1 - 41
Total number of pregnant goats	206
Average number of pregnant goats/farm	2.06 + 3.91
Range of pregnant goats on farms evaluated	0 - 24
Total number of lactating does	368
Average number of lactating does/farm	3.68 + 4.04
Total kid population	362
Average number of kids/farm	3.62 + 4.51
Herd size	**Frequency %**
1 - 10	45.0
11 - 20	23.0
21 - 30	13.0
31 - 40	12.0
41 - 50	5.0
51 - 60	1.0
> 60	1.0

+ SD = Standard Deviation

3.2 Traditional goat management husbandry techniques

Table 2 presents the management practice (housing and health care) under traditional goat husbandry in the study area. Ninety-five percent of the farmers interviewed practised extensive system (7 - 8 grazing/day) and 5% practised semi-intensive system where goats grazed for 4 hours during the day and spent most of the time eating crop residues and supplements in the kraals. Housing for goats known as kraals were built from barbed wire fence and poles as well as thorny sticks cut from the range. The kraals are located a few metres from the homestead of the farmers. Only 13% of the respondent farmers de-wormed their goats using valbasin and dewo-injection. Out of the 13% de-worming their goats, 9 are male farmers and 2 of them de-worm their goats three

times a year, that is beginning of rainy season (October), April and May. Twenty-one percent of the respondent farmers dipped their goats using triatex and 5% out of the 21% use the chemical together with tick-grease.

Table 2: Management practice (housing and health care) under traditional goat husbandry in Kgatleng and Kweneng districts

Parameters	Value/ frequency % Farmers	Gender of Respondent Farmer	
		M	F
Management system			
extensive	95	56	39
semi-intensive	5	3	2
Housing types			
round kraals from thorny sticks (no roof)	86	48	38
barbed-wire fence with poles (no roof)	14	10	4
Health care			
deworming	13	9	4
no deworming	87	53	34
Deworming frequency			
once in a year	8	7	1
three times a year	5	2	3
dipping	21	16	5
no dipping	79	44	35
Dipping frequency			
once a year	5	5	0
three times a year	8	5	3
every month	8	6	2
Hoof trimming	7	4	3
no hoof trimming	93	55	38
Hoof trimming frequency			
irregular	5	5	0
when hooves overgrow	2	0	2

3.3 Milking, feeding and watering of sample Tswana goat herds

Milking was practised by 32% of the respondent farmers out of which 13% were female farmers. On average a doe produced 350 ml of milk per day while the average production per farm per day was 936 ml. This value is lower than 0.5 - 1.5 kg of milk pro-

duced daily by Maradi goats of Niger reported by Payne (1990). Only 34% of the respondent farmers gave their goats crop residues, 13% lopped browse trees to feed their goats while 2% gave their goats (rumevite) mineral supplements. Crop residues fed included bean pods, sorghum stovers, sorghum husk and maize leaves. Poor feeding might be part of the reason for low milk production, which needs to be improved.

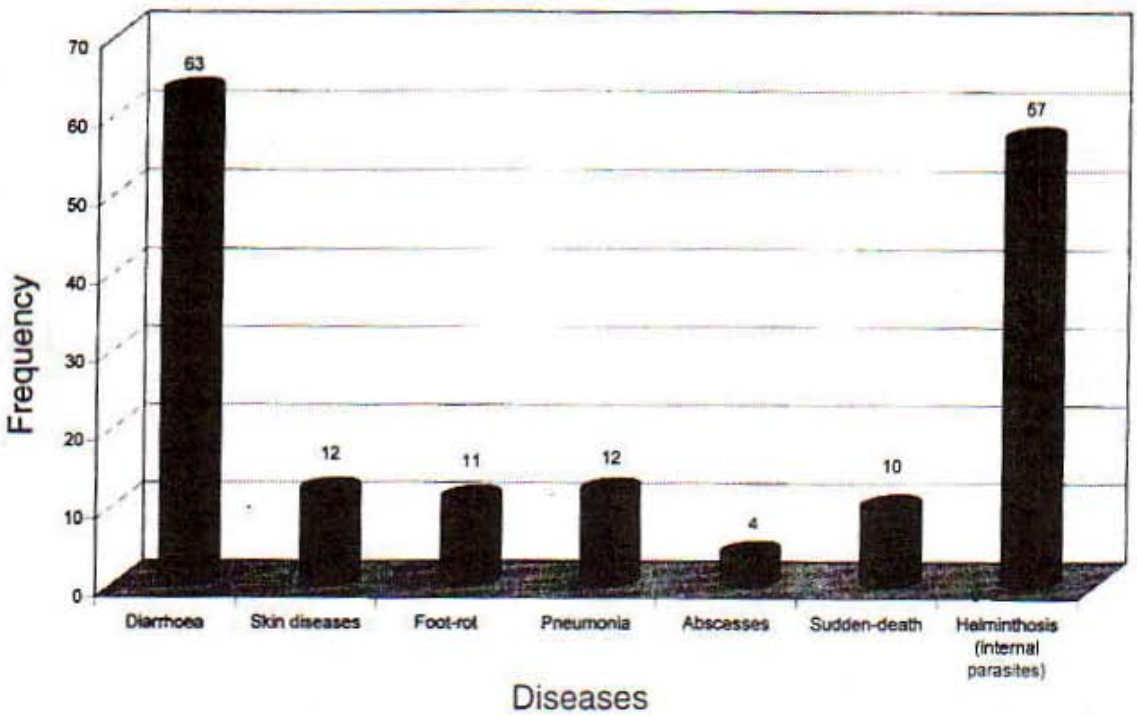
Table 3: Milking feeding, and watering of Tswana goats under traditional management system in Kgatleng and Kweneng districts

Parameters	Value/ frequency %	Gender of Respondent Farmer	
	Farmer	M	F
Milking			
Respondent farmers milking their does	32	19	13
not milking	68	32	36
Milking frequency			
once in a day	30	18	12
twice a day	2	1	1
average milk production (ml) day/doe	350 + 82.679		
average milk production (ml) day/farm	936 + 162.86		
Supplementary feeds			
crop residues	34	24	10
no crop residue feeding	68	39	29
lopping of browse trees	13	9	4
no lopping of browse trees	87	50	37
mineral supplements offered	2	2	0
no mineral supplements provided	96	56	40
Water source			
streams	24	14	
small dams	17	12	5
boreholes	10	4	6
tap water	47	29	18
running surface water	2	1	1
Watering frequency			
daily	68	38	30
any time	32	20	12

3.4 Constraints on goat milk production

Table 4 shows constraints on goats' milk production and 85% of the respondent farmers indicated that unavailability of feeds was the major problem to goat milk production since kidding coincided with the dry season when there was not enough forage. This problem could be solved if more farmers practised crop residue feeding and also plan their breeding such that kidding coincides with the beginning of the rainy season. Problems associated with the conditions of the udder accounted for the remaining 15% of the milk production constraints.

Figure 1: Incidence of Diseases in Goats



3.5 Domestic uses of goat milk

The goat is generally known to produce relatively higher milk yield per unit of live weight compared with the cow (DEVENDRA, 1980). In many countries, goat milk is marketed as a health food with relative advantage over other types of milk from different animal species. Presently, in Botswana goats' milk consumption is limited to small-scale goat farmers and their families. Only 32% of the respondent farmers milked their goats. They used the goats' milk for tea, food especially soft sorghum porridge and direct drinking (table 5). Goats' milk has the following advantages: scarcity of tubercle bacilli, high proportion of small fat globules facilitating easy digestion, anti-allergic properties and lower lactose content for lactose - intolerant individuals. Haenlein (1992) stated that goat milk is a valuable source of amino acids (histidine, aspartic acid and tyrosine) and has a relatively higher content of C_6 - C_{14} fatty acids in addition to high Vitamin A, nicotinic acid, choline and ascorbic acid compared with milk from other animal species. Despite these inherent nutritional advantages of goat milk, 68% of

respondent farmers (Table 3) did not milk their goats. The most important constraint is lack of awareness of its nutritional advantages.

Disease problems have been a limiting factor of goat production in the tropics and subtropics. Incidence of diseases in the sample goats' herd is shown in fig. 1. Diseases include internal parasitism (helminthiasis) pneumonia, skin diseases etc.

Table 4: Constraints to goats' milk production

Problem	Frequency % (N= 100)
Nonavailability of feeds	85
Diseases of the udder	
pendulus	3
unequal teats	1
hard teats	8
abscesses on the udder/teat	2
wounds on the udder/teat	1

Table 5: Domestic uses of goats' milk and its preparation

Uses and Preparation	Frequency % (N = 32)
Drinking as pure milk	46
boiled before drinking	38
not boiled before drinking	8
Used for tea	72
boiled before mixing with tea	72
Consumed with porridge	51
not boiled before usage in porridge	40
boiled before usage in porridge	11
Used for sour milk	7

There is a need for increased consumption of goat milk for people to derive the full nutritional potential of the readily available protein source in Botswana. Haenlein (1984) reported biochemical differences highlighting major metabolic advantages of goat milk over cow milk. Haenlein (1992) observed that goat milk contains significantly lower bacteria counts than cow milk and that a variety of microbial organisms can exist in goat milk without being pathogenic. The relative importance and nutritional advantage of goat milk over cow milk based on lactalbumin and lactoglobulin sensitivity in humans was highlighted by Zeman (1982).

4 Conclusions and recommendations

There is need for improvement of milk yielding capacity of Tswana (local breed) goats in Botswana. This can be achieved by selection, cross breeding, improved management and feeding. Awareness programmes on goat raising and nutritional advantages of goat milk should be provided to small scale farmers. Enlightenment of goat farmers in terms of disease prevention measures such as routine deworming, dipping, use of supplementary feeds as well as planned breeding programmes. This will enhance increased goat milk production and consumption and subsequent reduction in fresh milk importation.

5 Traditionelle Ziegenhaltung und Verwendung der Ziegenmilch im Kgatleng und Kweneng Distrikt in Botswana

Zusammenfassung

Botswana, mit einem geschätzten Ziegenbestand von 1,83 Mio Tieren, hat keine ausreichende Milchversorgung. Die Arbeit basiert auf einer Untersuchung bei 100 Bauern, davon sind 40 Bäurinnen. Die erfaßten 1769 Ziegen der Rasse Tswana, davon 1319 weibliche Tiere, 362 Zicklein und 88 Böcke wurden in durchschnittlichen Herdengrößen von 17,69 Tieren, 13,19 Ziegen und 3,62 Zicklein gehalten.

Eine extensive Ziegenhaltung betreiben 95 % mit 8 Stunden täglicher Weidezeit und eine semi-intensive mit 4 Stunden 5% der Halter. Zur zusätzlichen Fütterung während der Trockenzeit lagern 34 % der Halter Ernterückstände von Mais, Hirse und Bohnen ein. Durchfall, Wurmbefall und Lungenentzündung sind die Hauptkrankheiten und als Problem wurde fehlendes Futter von 85 Haltern genannt.

6 Acknowledgement

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