

# Snakebite Management in Cattle by Farmers in Lentsweletau Extension Area of Kweneng District in Botswana

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**ABSTRACT:** A study was conducted to identify and document practices and plants species used for the management of snakebite in cattle in Lentsweletau extension area in Kweneng district of Botswana. Thirty-nine farmers and cattle herders were interviewed through the use of structured questionnaires for the various ways used to manage snakebite. Most of the respondents were males (74.36%) while 25.64% were females. Majority of the respondents (33.33%) did not use any medicine to treat or manage snakebite while 30.77% used modern medicine, 28.21% used traditional remedies and 7.69% used both modern medicine and traditional remedies. Of the farmers who used modern medicine, terrymycine injection (45%) was the mostly used followed by potassium (35%), sulphur (15%) and lastly tar (5%). Some respondents reported the use of medicinal plants. They identified four plants species from four different families; *Ziziphus mucronata*, *Diospyros lyciodes*, *Euphorbia mauritanica* and *Aloe spp*. The parts used were branches, roots and leaves. They were administered through oral (80%) and topical (20%) routes. It is important to find out the bioactive compounds in the reported plants so that they can be purified and used in snakebite management in cattle, in rural areas where antivenom is not easily available.

**KEYWORDS:** Cattle, snakebite, Lentsweletau, traditional medicine, medicinal plants.

## I. INTRODUCTION

A large percentage of Botswana's population resides in rural areas and is mostly dependent on agriculture where livestock production dominates [1]. Farmers in rural areas are sometimes faced with livestock diseases and problems like snakebite. Botswana has about seventy two species of snakes, of which about 80% are not venomous. However, there are some poisonous species like the Mozambique spitting cobra, the boomslag, the twig snake, the puff adder and the black mamba in the country. Cattle are believed to be more vulnerable to snakebite than goats [2]. Snakebite can be a serious problem to cattle in summer when it is warm and favourable for snakes to be out of their holes hunting on pastures where cattle graze. During grazing, cattle are at a high risk of coming in contact with snakes. Snakebite has been reported as a serious problem for livestock all over the world [3; 4]. Documentation of mortalities caused by snakebite in Botswana is scarce.

Poisoning by snakebite requires an immediate medical attention. Some farmers are either resource poor or stay far away from urban areas and they cannot easily acquire modern medicine for their livestock. Such farmers usually tend to use traditional remedies. The use of traditional medicine to treat and manage snakebite has been reported in both human beings and livestock [5; 6; 3; 7; 8] in Africa. The current study identifies and documents practices and plants species used by farmers to manage snakebite in cattle in Lentsweletau extension area in Kweneng district of Botswana. There is no available literature on the subject at Lentsweletau hence this study. The indigenous knowledge of the Lentsweletau community has to be documented and preserved so that it is not lost with time due to modernisation pressures or the loss of some species used in the traditional practices due to habitat destruction.

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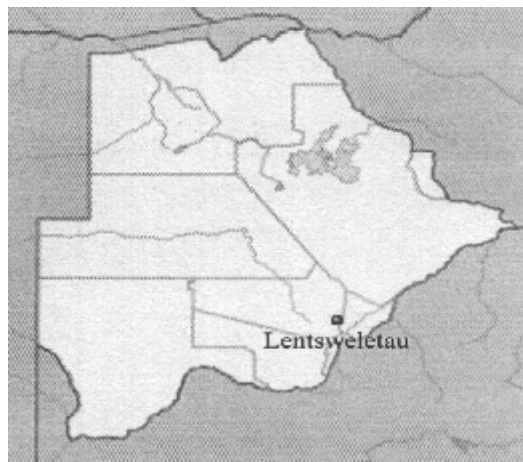
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## II. MATERIALS AND METHODS

### *Study site*

Figure 1 shows the location of the area where the study was conducted. The study was conducted at Lentsweletau village in Kweneng district of Botswana from May to July 2015. The village is located at 24° 22' 47" S x 25° 51' 0" E, about 60 km north of Gaborone, the capital city of Botswana.



**Figure 1: Map of Botswana showing the location of Lentsweletau village in Kweneng district.**

### *Data collection and statistical analysis*

The community of Lentsweletau carries out both pastoral and arable farming on lands in the periphery of the village. Thirty-nine farmers and cattle herders were interviewed through the use of structured questionnaires to gather information on the various ways used to manage snakebite in cattle in Lentsweletau extension area in Kweneng district. Verbal consent for the study was obtained from the respondents. The main data captured in the questionnaire included demographic characteristics, whether respondents used modern medicine or traditional remedies to manage or treat snakebite in their cattle. The respondents were also asked about the plant species and the plant parts used to manage snake bite. Data were analyzed using statistical and simple percentage methods. Tables and a bar chart were used to present the results.

## III. RESULTS AND DISCUSSION

Table 1 shows the demographic characteristics of the respondents. The results revealed that males were the main owners and herders of cattle, constituting 80.56% of the total respondents while females constituted 19.44%. This is in agreement with [1] who reported the ratio of male to female ownership of cattle holdings to be 3 to 1 in Botswana. Women and children in Botswana are mostly owners of small stock like goats and chicken. The ratio could be attributed to the fact that in rural villages, women usually stay at home looking after children and old people or caring for the sick while men go to work or to the cattle posts. Slightly above half the number of the respondents were under the age of fifty years and were mostly cattle herders while those over fifty years of age were mostly cattle owners. This again can be attributed to the fact that most Botswana venture into farming after retirement from employment.

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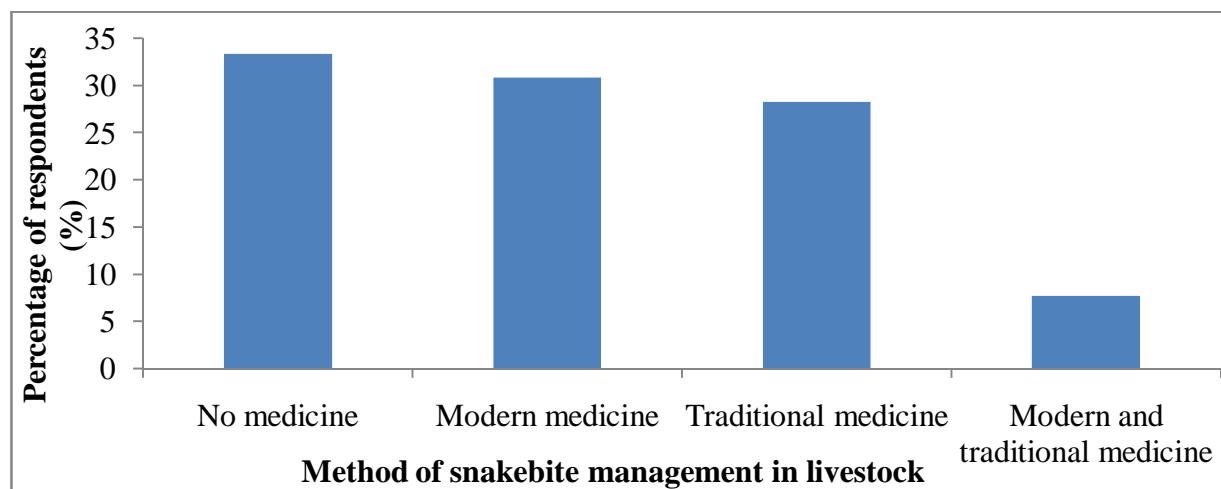
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**Table 1: Demographic characteristics of the respondents**

Variable n = 39	Category	Number of respondents	% of respondents
Gender	Male	29	74.36
	Female	10	25.64
Age (years)	Less than 50	20	51.28
	50 and above	19	48.72

Majority of respondents (33.33%) did not use any medication to treat or manage snakebite on their cattle, 30.77% used modern medicine only, 28.21% used traditional remedies only while 7.69 % used both modern and traditional medicine (Figure 2). The high percentage of respondents who did not use medicine to treat snakebite may show that most of the snakes in the study area are not poisonous. The snakebite resolves without any treatment. It may also be due to lack of knowledge of what traditional remedies to use by respondents or lack of money to buy modern medicine [8]. The study area has a veterinary office where farmers could go and ask for help. The use of traditional medicine may be the farmers' choice or due to the price of modern medicine, since some farmers are resource poor. Some farmers may choose traditional remedies because they find them cheap and easy to prepare [9]. Farmers may also go for traditional remedies due to lack of knowledge in the use of modern medicine [10].



**Figure 2: Snakebite control and management in Lentsweletau extension area in Kweneng district of Botswana**

Table 2 shows the traditional remedies or practices used to manage snakebite in cattle as reported by the respondents. The use of various parts of a snake mixed with medicinal herbs and bloodletting are the most common traditional practices reported. The significance of bloodletting is to release venom from the body. In the current study, the dried and ground snake bile is mixed with medicinal herbs and applied to the bite site that has been scarified with a sharp needle. The cremated snake head, tail and gallbladder of a snake are ground into powder, mixed with water and taken orally. The remedy prepared from the cremated parts of a snake has been reported in South Africa and is referred to as *isibiba* [6]. Other common remedies included the use of snuff, traditional medicine from the cattle kraal charm, tar from tobacco pipe and drinking milk. Milk is used to neutralise the venom. The use of parts of a snake as well as milk to treat snakebite shows that the community uses zootherapeutic products in addition to medicinal plants and modern medicine. Zootherapeutic practices had been recorded in different parts of the world [11; 12] and in Botswana the information is scarce. The use of snuff and bloodletting to manage snakebite has been reported in other studies [6]. However, some researchers do not support the use of traditional remedies because it delays seeking medical attention which can result in increased cattle mortality [6].

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**Table 2: The traditional remedies used to manage snakebite in cattle in Lentsweletau area**

Traditional remedy	Frequency of report (%)
Cut a blood vessel to let blood and snake venom out.	9.09
Cut the bitten area to blood let.	18.18
Rub tar from tobacco pipe on the bite site	9.09
Draw medicine from kraal charm (lenaka) and apply to the bite site	9.09
Dried snake bile ground and mixed with medicinal herbs, then rubbed on the scarified bite site.	27.27
Ground burnt head, tail and gall bladder of a snake mixed with water and administered orally.	9.09
Milk taken orally to neutralise the snake venom	18.18

Table 3 shows a display of the names of the various plants, the parts of the plants and the method of administration of plants used to manage snakebite in cattle in Lentsweletau extension area. The plant species that were utilised for snakebite management were identified by respondents. The names of the plant species were confirmed at Botswana College of Agriculture herbarium. The plant parts used for management of snakebite in cattle and their methods of preparation were also identified. The parts used were roots (50%), leaves (25%) and branches (25%). They were administered through oral and topical routes. Oral application (80%) was the most commonly used route of application. The leaves of *Euphorbia mauritanica* are usually crushed and put in water used to wash hands by people after burials in Botswana. The plant is believed to cleanse bad luck. In this study the plant is said to cleanse the venom from the animal. *Diospyros lyciodes* is used to cure infertility in women and reported to have antibacterial activity; lupeol and ursolic acid [13]. *Ziziphus mucronata* roots have been reported to cure other cattle diseases like diarrhoea in Ohangwena and Oshikoto regions of Namibia [14]. Moreki et al. [15] reported the use of *Z. mucronata* as a traditional remedy for retained placenta in cattle in Mogothono in Botswana. *Ziziphus mucronata* is reported to have anthelmintic and antimicrobial activities [13]. The use of *Aloe* in the treatment of snakebite in humans has been reported in rural South Africa [6]. *Aloe* has also been reported in the control of intestinal parasites in goats [8]. The use of medicinal plants in the treatment of snakebite has been reported in other countries [4]. It is important to find out the bioactive compounds in the reported plants so that they can be purified and used in cattle, in rural areas where antivenom is not easily available.

**Table 3: Names of various plants, their parts and methods of application in the traditional management of snakebite in cattle.**

Plant scientific name	Family	Plant Tswana name	No: of responses	Part of plant used	Method of administration
<i>Euphorbia mauritanica</i>	Euphorbiaceae	Mosimama/mosiama	1	Branches	Branches ground, mixed with milk and taken orally as well as applied to the bitten area.
<i>Aloe spp</i>	Xanthorrhoeaceae	Mokgwapha	1	Leaves	Leaves crushed, put in water and taken orally.
<i>Diospyros lyciodes</i>	Ebenaceae	Motlhajwa/letlhajwa	2	Roots	Roots boiled and taken orally.
<i>Ziziphus mucronata</i>	Rhamnaceae	Mokgalo (Buffalo thorn)	1	Roots	Roots boiled and taken orally.

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Table 4 shows the modern medicine used to manage snakebite, their method of administration and the percentage frequency of their report. Terrymycine injection (45%) is the mostly used medicine and tar (5%) is the least used. The use of potassium in the treatment of snakebite in humans has been reported in rural South Africa [6]. Some respondents (30.77%) preferred to use modern medicine to treat snakebite because it is safer and efficient.

**Table 4: Modern medicine used to manage snakebite, their method of administration and their frequencies**

Modern medicine	Method of administration	Frequency of report (%)
Terrymycine	Injection	45
Potassium	Orally (dissolved in water)	35
Sulphur	Injection	15
Tar	Inhaled through the nose	5

#### IV. CONCLUSION

The study has revealed that the Lentsweletau community either use no medication, modern medicine only, traditional medicine only or both traditional medicine and modern medicine to treat or manage snakebite in their cattle. The study has also revealed that the community is rich in indigenous knowledge in traditional medicine, using both medicinal plants and zootherapeutic products. The lack of using either traditional or modern medicine to treat snakebite in cattle reported in this study may be due to lack of knowledge of what traditional remedies to use, or lack of money to buy modern medicine, hence the importance of documenting traditional indigenous knowledge so that it can be passed from one generation to another. However, it is important to identify and scientifically validate the safety and efficacy of the traditional practices and the medicinal plants recorded in this study. It is also important to conserve biodiversity since some flora and fauna are of medicinal value.

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