

# **A SURVEY OF TRADITIONAL BEEF CATTLE FARMERS IN SOUTHERN BOTSWANA: DEMOGRAPHIC PARAMETERS AND ADOPTION OF CERTAIN IMPROVED MANAGEMENT PRACTICES**

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## **ABSTRACT**

*The aims of this survey were to characterise traditional beef cattle farmers and evaluate the adoption of certain improved management practices by these farmers in southern Botswana. The study was carried out over a period of 8 months i.e. March to October 2002. Demographic data, marital status, level of education, use of vaccination, record keeping, breeding system in use and management system used were collected from randomly chosen farmers using a formal questionnaire. A total of 71 beef cattle farmers were interviewed in 50 different villages of Kgatleng, Kweneng and Southern Districts of Botswana. Data were analysed using Procedure Frequency in Statistical Analysis System. The majority of the farmers were males (87%), aged over 35 years (83%), married (75%) and with either primary or no education (62%). The majority of the farmers (86%) practiced extensive management and did not keep production records (83%). Most farmers (99%) supplementary feed their animals and all farmers (100%) vaccinate their animals against certain diseases. The majority of the farmers (94%) did not control the breeding season of their herds and the majority (87%) also let bulls run with cows all year round. Most of the sampled farmers (56%) used artificial insemination (AI) to improve the genetic quality of their cattle. The constraints, which prevented farmers from using AI were long distances (over 60 km) between cattle post and AI camp centre, limited carrying capacity of the AI camps, small numbers of cows permitted per farmer per breeding season (5) and cows which were pregnant during stocking at the beginning of the breeding season. Farmers should be encouraged to know how to read and write to enable them to communicate better. Farmers should also be taught the benefits of controlling breeding and use of modern management practices such as use of AI and keeping production records. More AI camps should be set up to reduce the distance travelled by those farmers who are far way from an AI camp centres and also to accommodate more cows.*

## **1. INTRODUCTION**

Beef cattle production is the backbone of the rural economy in Botswana. It is for this reason that livestock improvement and research have emphasised more on this industry than any other agricultural sub-sector (Animal Production Range and Research Unit, 1970-1990). Two systems of production exist for beef cattle in

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Botswana viz traditional and commercial. Traditional or communal production system is practised on communal areas where fencing is not allowed. Hence it is not easy to control breeding. Commercial or freehold land on the other hand is fenced and hence it is easy to control breeding (Nsoso & Morake, 1999). Information on demographic parameters and uptake of modern management practices in beef cattle farming is scarce, especially under traditional farming system in Botswana. Therefore, the objectives of this study were to:

- characterise the traditional beef cattle farmers in southern Botswana
- evaluate the adoption of certain improved management practices by the above farmers

## **2. MATERIALS AND METHODS**

Data on demographic parameters, marital status, level of education, use of vaccination, record keeping, breeding system in use and management system used were collected using a formal questionnaire. A random sample of 71 beef cattle farmers was visited and asked questions by one of the authors. Based on the average distance cows can walk in one day, farm or cattle post locations were artificially categorised as follows:

- Near to artificial insemination (AI) camp i.e. within a radius of 0-30 km from AI camp centre
- Intermediate distance to AI camp i.e. within a radius of 31- 60 km from AI camp centre
- Far from AI camp i.e. outside a radius of 60 km from AI camp centre. AI camp farm managers (n=3) in southern Botswana were also interviewed on the usage of the AI Program in their districts.

## **3. SURVEY PERIOD AND AREAS COVERED**

The survey was conducted from March 2002 to October 2002. Beef cattle farmers from fifty (50) villages in the Kweneng, Kgatleng and southern districts, which form the greater part of southern Botswana, were interviewed.

## **4. DATA ANALYSIS**

Data were analysed using Procedure Frequency in Statistical Analysis System

(SAS, 1999 - 2000).

## 5. RESULTS AND DISCUSSION

According to Table 1, a total of 71 beef cattle farmers were interviewed in southern Botswana. Females and males formed approximately 13 and 87% of the sample respectively. Approximately 17, 49 and 34% of the farmers were in the 21-35, 36-55 and above 55 years age groups respectively. In terms of education level; 31, 31, 10 and 28% of the farmers had no education, primary, secondary and tertiary qualifications respectively. In agreement with Aganga *et al.* (2000), the secondary school leavers should be attracted into livestock farming by provision of necessary amenities in rural areas and agricultural aids such as Citizen Entrepreneurial Development Agency (CEDA) to facilitate their farming enterprises because most of them do not get formal employment. Approximately 24% of the farmers were not married and 75% were married while less than 1.5% were divorced. Approximately 32, 31 and 37% farmers interviewed were from Kgatleng, Kweneng and southern districts respectively. The above demographic parameters indicate that everybody participates in beef farming, therefore improving performance in this sector would improve the livelihood of the majority of the people in the rural areas.

**Table 1: Demographic parameters of traditional beef cattle farmers in southern Botswana**

<b>Parameter</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
<b>Sex</b>		
Female	9	12.68
Male	62	87.32
<b>Age distribution</b>		
21 – 35 years	12	16.90
36 – 55 years	35	49.30
> 55 years	24	33.80
<b>Education</b>		
None	22	30.99
Primary	22	30.99
Secondary	7	9.86
Tertiary	20	28.17
<b>Marital status</b>		
Married	53	74.65
Single	17	23.94
Divorced	1	1.41
<b>District</b>		

Kgatleng	23	32.39
Kweneng	26	36.62
Southern	22	30.99

As shown on Table 2, only 17% of the farmers interviewed kept production records of their beef cattle while 83% did not. Nsoso *et al* (2003) also reports this phenomenon, where 100% of communal Tswana pig farmers did not keep records. It is typical of traditional farming in Botswana that farmers do not keep any records. Farmers should keep records because any efficient business must maintain standards on production, keep records and maintain both physical and financial control of the business (Morris, 1976).

**Table 2: Management practices of traditional beef cattle in southern Botswana**

Management practices	Frequency (n)	Percentage (%)
<b>Record keeping</b>		
Number of farmers keeping production records	12	16.90
Number of farmers not keeping production records	59	83.10
<b>Management system</b>		
Extensive	61	85.92
Semi-intensive	9	12.68
Confinement	1	1.41
<b>Supplementary feeding</b>		
Number of farmers supplementing	70	98.59
Number of farmers not supplementing	1	1.41
<b>Vaccinations</b>		
Number of farmers vaccinating	71	100

Approximately 86% of the farmers farmed under the extensive management system, while 13% used semi-intensive management and 1% of the farmers practised intensive management (Table 2). This trend is consistent with general beef production in Botswana as reported by Botswana Agricultural Census Report (1999), where over 80% of beef cattle are found under the communal or extensive management system.

Nearly all farmers (99%) supplement their beef cattle particularly with dicalcium phosphate and salt (Table 2). This is in line with the findings of Animal Production and Range Research Unit (APRU) (1970-1990), which reported that continuous feeding of a phosphate supplement is essential in all areas of Botswana because

soils are deficient in phosphorus.

All the farmers vaccinated their cattle mainly against Black Quarter, Botulism, Anthrax, *Brucellosis* and only a few vaccinated against *Pasturellosis* (Table 2). Some of these vaccines are provided free of charge by the government e.g. Anthrax, Black Quarter, Contagious Abortion and Foot and Mouth (Gaynor, 2003). This is because the beef industry is of tremendous importance in Botswana, especially for the rural people where it is the backbone of the economy. The adoption of a routine programme of preventative vaccinations and treatments according to the prescribed schedule is the most economic approach to health control (APRU, 1980). Farmers should be encouraged to continue this good management practice.

Most of the farmers (87%) interviewed did not control breeding, while 13% controlled breeding (Table 3). This is typical of traditional farming in Botswana where animals mix freely and any bull would mate any cow which is on heat, since the grazing areas are not fenced (Nsoso & Morake, 1999). For those farmers who do not control breeding, the breeding season is all year round, while those who control breeding, use a breeding season from January to March each year.

**Table 3: Breeding management and use of AI by traditional beef farmers in southern Botswana**

Parameter	Frequency (n)	Percentage (%)
<b>Season of breeding</b>		
All year round	67	94.37
January - March	4	5.63
<b>Breeding control</b>		
Farmers controlling breeding	9	12.68
Farmers not controlling breeding	62	87.32
<b>Use of AI</b>		
Farmers using AI	40	56.34
Farmers not using AI	31	43.66

Nearly 56% of the farmers utilised artificial insemination (AI) while 44% of the sampled farmers did not (Table 3). AI has many advantages such as higher mating ratios and good disease control if properly used (Ensminger, 1977; Bourdon, 1997). The most important advantages of using AI in traditional farming in Botswana is that it would lead to controlled breeding if all selected bulls could be kept at AI stations and the rest castrated. This would lead to farmers choosing the best bulls and also controlling calving seasons hence adopting appropriate management

strategies for efficient beef production.

The practice of extensive management by most of the farmers (86%), renders controlled breeding difficult (Table 3). For the farmers with few animals e.g. 20 breeding cows or less, most cows are found to be pregnant during Pregnancy Diagnosis (PD) by the Department of Animal Health & Production (DAH&P) staff when AI camps are restocked for the AI service. This is done during September to October each year. According to Payne (1990) it is difficult to utilise ordinary AI techniques to any major degree on extensive holdings. However, he states that the most satisfactory method is to gather a limited number of the most productive breeding beef cows onto a small area of the holding in order to synchronise their oestrus cycles and then inseminate them over a short period. Using this technique, an upgrading programme can proceed rapidly in a small, specially selected nucleus herd. This nucleus herd can be kept for the production of improved bulls that are subsequently used in the breeding herds out on the extensive grazing (Payne, 1990). Such a strategy could be implemented in Botswana together with AI to benefit the resource poor small-scale farmers.

According to the AI camp farm managers in southern Botswana, farmers do bring large numbers of cows. This has proved to be true because the AI camps reach their stocking rate before the pregnancy diagnosis (PD) schedule is finished. This forces the AI staff to leave out cows from other farmers for the breeding season, due to the low capacity and low number of cows permitted per farmer per breeding season. These problems caused the number of cows per farmer to decrease from 20 to 5 (Kapele, 1999) and farmers around Ramatlabama area in southern Botswana grouped themselves to form a private AI camp called Panyane. The government should encourage the setting up of more private AI stations together with on farm AI.

Farmers owned a total of 2 717 cows, which translates to 38 cows per farmer. The farmers also owned a total of 103 bulls at an average of about 1 bull per farmer. Physical bulls are needed to cover those cows, which may not conceive after the regular AI season. Teaser bulls may also be appropriate to help detect cows on heat. The use of teaser bulls is known to increase conception rates from AI.

Approximately 34, 30 and 37% of the farmers interviewed were nearer to AI camps (within 0-30km) from AI camp centres, at an intermediate distance (within 31-60km) from AI camp centres and far (more than 60km) from AI camp centres respectively (Table 4). Of those farmers near to the AI camp, 87.5% utilised AI, while 12.5% did not. Of those at intermediate distance, 57% of the farmers used AI, while 43% did not. Of the farmers far from the AI camp, 19% used AI, while 81%

did not (Table 4). This is in agreement with Kapele (1999) who stated that farmers nearer to AI camps use AI in higher numbers than those who are far because of long distance to AI camps. This means that to benefit farmers, this should be considered when new AI camps are formed.

**Table 4: The effect of distance from AI centre on the use of AI by traditional beef farmers in southern Botswana**

<b>Distance from AI centre</b>	<b>Frequency<sup>1</sup> (n)</b>	<b>Percentage (%)</b>
<b>Near distance (0 - 30 km radius from AI camp centre)</b>	<b>24</b>	<b>33.80</b>
Farmers using AI	21	87.50
Farmers not using AI	3	12.50
<b>Intermediate distance (31 - 60 km Radius from AI camp centre)</b>	<b>21</b>	<b>29.58</b>
Farmers using AI	12	57.14
Farmers not using AI	9	42.86
<b>Far distance (&gt; 60 km radius from AI camp centre)</b>	<b>26</b>	<b>36.62</b>
Farmers using AI	5	19.23
Farmers not using AI	21	80.77

<sup>1</sup> This column shows the number of farmers in each sub-category, further subdivided into those who were using AI and those who were not

## 6. CONCLUSIONS

The demographic parameters of the present study indicate that most members of society participate in beef farming in southern Botswana. Therefore, improving performance in this sector would improve the livelihood of the majority of the people in the rural areas. The majority of sampled farmers in southern Botswana used some improved management practices. However, there is need to encourage a higher uptake of these than at present for efficient beef production. The constraints preventing farmers from using AI are long distances i.e. a radius of more than 60km between cattle posts and AI centres, limited carrying capacity of AI camps, small numbers of cows permitted per farmer per season and lack of controlled breeding. Most cows were pregnant when brought in for insemination. The government should encourage setting up more AI camps to reduce the distance travelled by farmers to seek for such service.

## **ACKNOWLEDGEMENT**

The authors would like to thank Mr T. Bagwasi, Senior Agricultural Research Officer of the Department of Agricultural Research, Ms G. J. Kapele, Scientific Officer and Mr C. Tangane, Principal Technical Officer of the Department of Animal Health and Production for the information they provided. AI Camps Farm Managers and beef cattle farmers are thanked for providing data. Botswana College of Agriculture provided funds for the study.

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