BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCES

ASSESSMENT OF SOCIO-ECONOMIC FACTORS AFFECTING GOAT BREEDING PRACTICES AND TRAITS PREFERENCES OF SMALLHOLDER FARMERS, MHONDORO

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APPROVAL FORM

The signatories confirm that they have read and recommended to the Bindura University of Science Education for acceptance of the project title: assessment of socio-economic factors affecting goat breeding practices and traits preferences of smallholder farmers, Mhondoro

SUPERVISON SIGN _____Date _____

COORDINATOR SIGN _____Date _____

CHAIRPERSON SIGN _____ Date_____

ABSTRACT

*The aim of this research project was to investigate and identify the socioeconomic factors that influence goat breeding practices and goat breed traits preferences of small holder farmers with distinctive reference to Mhondoro district. Data were obtained from the mixed–methods approach, including surveying and interviewing 40 respondents chosen through random sampling. For this study, respondents were asked to state the goat breeds in their stock and the reasons for selecting their current breeds. The respondents were asked to rate their preferred trait and breeding practice on a scale of 1(least preferred) to 5 (most preferred). Linear regression analysis using SPSS (23) to assess the relative importance's of various variables. Disease resistance and adaptability were more preferred traits in smallholder production. As a result Matebele and Mashona goats were the most preferred breeds. Nucleus breeding schemes are recommended to optimize the limited available resources. The study indicated that income level, education, access to veterinary services and market affected the breeding practices and breed trait preferences of farmers. From the study results attained I recommend that there is need for increased extension and veterinary services to goat producers so as for them to have improved breeding practices and breed trait preferences. Also, I recommend the government to increase the channels of credit directed to small holder farmers so as to increase production.

DEDICATION

This dissertation is dedicated to my parents, siblings and friends, for giving me continued financial support, emotional support and love.

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Firstly my sincere gratitude goes to Almighty God, for making it possible for me to complete this study.

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LIST OF ACRONYMS

AI	Artificial Insemination
FAO	Food and Agriculture Organization
NGO	Non-Governmental Organisation
AGRIBAN	Agriculture Bank
GDP	Gross Domestic Product

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CHAPTER ONE

1.0 Introduction

About 35% of the world's goats population is found in Africa (Haile, Gizaw et al. 2019). Goat farming requires less initial investment and goats are simpler to sell than larger animals. In the majority of Southern Africa, smallholder farmers with limited resources raise goats on modest a scale. However, due to increased knowledge of goat management, commercial production is beginning to grow. Goat farming is a common technique among smallholder farmers in developing nations because goats have a greater feed efficiency than other ruminants. Goats are very crucial to the livelihoods of developing countries by providing both tangible benefits (money from animal sales, skins, milk and meat) and intangible benefits such as insurance against emergencies, cultural and traditional ceremonies (Edwards 2020).

Substantial private and public funds have been invested in goats during the last decade to carter for the world increasing goat products demand due to rapid human population, dramatic urbanization and income change (E.Chivandi; 2019) Goat productivity can be increased by implementing a genetic improvement programme for instance introducing high milk and meat yield breeds such as Saanan, boer/ Khalahari breeds, respectively. Nutritional and managerial methods directly affect goat production. Breeding to produce desirable traits which require better nutrition and good selection is vital in improving goat farming (Sejian, Silpa et al. 2021).

The agro-ecological zone (AEZ), farming methods, and types of breeds retained are some of the different characteristics that can be used to categorize livestock production systems (Manirakiza, Hatungumukama et al. 2020). Worldwide goat production systems and goat traits vary widely in size, productivity and feeding regimes. As population grows, goat production rises in emerging nations (Michalk, Kemp et al. 2019). Increase in goat production is crucial in maintaining stable economy thus small holder farmers must be incorporated into both the production and the commercial markets because at present commercial markets for goats are underdeveloped.

The recent decline of commercial livestock in Zimbabwe is a result of market inefficiencies, farmers' lack of information about how to increase their output, and the country's erratic environment, which causes a shortage of dry feed and high mortalities, which reduces goat production. Goats are unevenly distributed on earth because they are tolerant to heat stress and can be produced in marginal regions. Goat farming experiences problems such as degradation of grazing land, competition of land use and poor quality pasture. The breeding of large ruminants is frequently of greater interest to policymakers than that of goats. (Bagheri Nejad, Krecek et al. 2020). However climate change also causes difficulties on goat farming (Marino et al 2016).

1.1 Problem Statement

Zimbabwe is a developing country with continuous increase in population thus food security has becomes an issue. Demand for goat products has risen as the population grew. The large demand for goat production and products is directly and largely driven by income growth, urbanization and human population growth (Mazhangara, Chivandi et al. 2019). Most goat producers are failing to meet up the demand. Competition for natural resources and feed will have an impact on goat output. (Correddu, Lunesu et al. 2020). Therefore the need to analyze and asses the factors causing reduced production so that a possible solution can be recommended to improve goat production. Breed traits and breeding practices directly impact growth rate, litter size and goat maturity thus affecting production.

Most goat farmers are failing to meet the demands of the products because they lack knowledge about the breeds they are rearing in relation to climate, feed type and breeding practices. Most goat producers are rearing goats for personal reasons thus addressing factors influencing breed traits preferences enables farmers to know the best breeds for increased production. Production of goats has a huge potential to reduce smallholder farmers' food insecurity and poverty. Small ruminants do not compete for food with humans and thus their production does not affect human food security.

1.3 Research Objectives

The main objective of the study was to examine the socio-economic variables influencing smallholder farmers' choices for particular goat traits and breeding procedures.

1.4 Specific objectives

The specific objectives to the study were to:

i. To evaluate characteristics of goat production in Mhondoro district.
ii. To determine the socio-economic factors that affect goat production.
iii. To outline solutions on how to reduce the vulnerability of smallholder farmers to socio-economic factors affecting production.
iv. To determine ways to improve goat breeding practices

1.5 Research questions

i. What are characteristics of goat production in Mhondoro district
ii. What are socio-economic factors that affecting goat production
iii. How to reduce the vulnerability of smallholder farmers to socio-economic factors affecting production
iv. How can smallholder farmers improve goat breeding practices

1.6 Justification of the Study

The department of livestock and veterinary services highlighted that there has been a large decrease in goat production in Zimbabwe. Goat production has been declining rapidly thus the need of knowledge about breeding traits and breeding practices suitable in the Mhondoro district so as to maximize production. The research is to highlight the problems faced by the farmers and outlining the possible measures which can be implemented to improve goat production. Knowing the smallholder farmers' goat traits preferences and breeding practices and traits preferences assist in the development of agricultural sector of Zimbabwe. The results of this research will indicate ways on improving goat production thus can be vital to NGOs, policy makers, smallholder farmers and any other organizations to improve breed traits and breeding practices ensuring high goat production. Smallholder farmers can acquire knowledge on some problems there are out looking highlighted in research. This study, pursues to find the socio-economic factors influencing goat breeds traits preferences and goat breeds practices, a case of Mhondoro district.

1.7 Delimitations

The study was carried out in Mhondoro, an area of fairly average rainfall (an average of above 750mm rainfall per year). The area was chosen since many smallholder farmers reside near to each other thus convenient in terms of data collection. This research focuses on socio-economic factors affecting breeding practices and goat breed traits preferences.

1.8 Limitations

The inability to raise enough money to cover the costs of moving from one region to another emerged as the study's main drawback. Another restriction was time because it was usually not enough to fit all the players in. Consequently, only 40 farms were chosen at random, in order to describe the elements that influenced the rearing of goats. The information was gathered over time where the majority of people were focusing on farming. People were unwilling to readily share knowledge as they were not familiar with the reseacher , which led to another major problem.

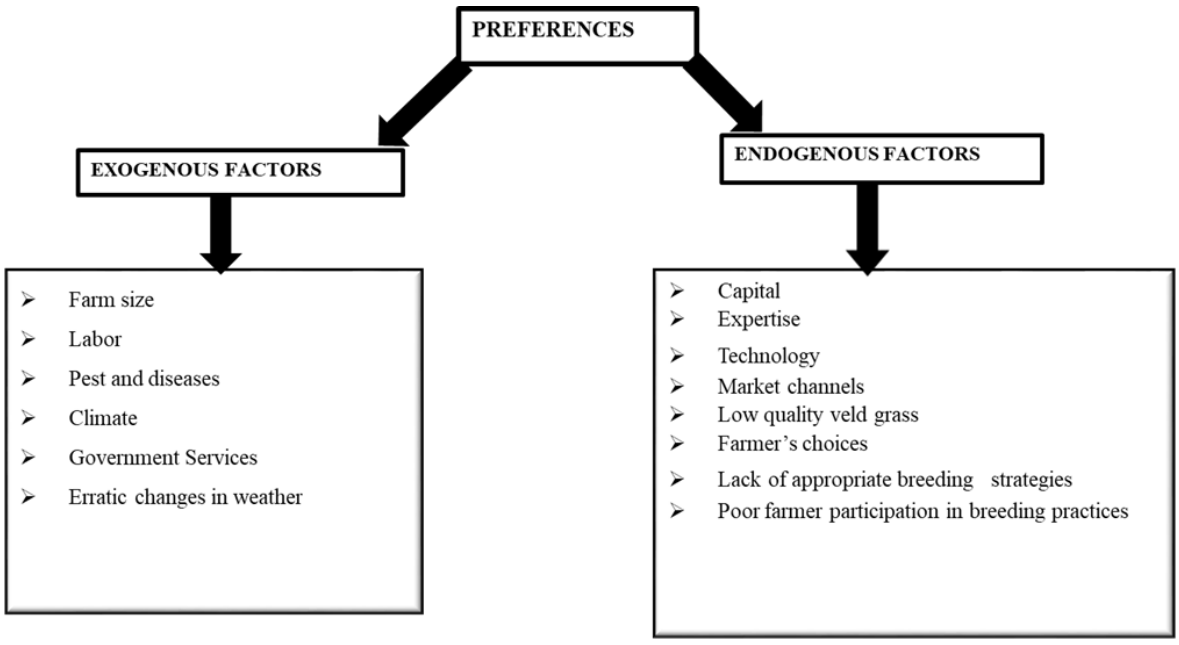
CHAPTER TWO

2.0 LITERATURE REVIEW

The chapter analyses the relevant writings that identifies the issues allied to factors affecting goat farming globally and locally. The chapter outlined definition of the key terms, factors affecting goat farming and also pointed out the socio-economic importance of goat breeding (farming) and management.. The role of extension officers and marketing aspects of goat meat in Zimbabwe is also reviewed. Henceforth this chapter also reviewed the goat breeding practices commonly practiced by the smallholder farmers.

2.1 CONCEPTION FRAMEWORK

Figure 1: The conceptual framework highlighting the factors affecting goat breeding practices and breeding preferences of smallholder farmers



2.2 Small holder farmer

According to FAO 2014, small holder farmer is a farmer will small piece of farming land relying mainly on family labor. Mdemu, Kissoly et al. (2020) defined small holder as a diversified group of households that encounter a range of challenges when attempting to engage in potentially lucrative agricultural sector activities.
About 80% of the 500 million small farms around the world are run by smallholder farmers, who also provide 80% of the food consumed in developing nations. This is so because goat uses food such as grass, fodder and waste that are not palatable to humans. The FAO 2009 highlighted that many smallholder farmers only engage in production at the lower end of the scale, where a modest increase in input yields a sizable boost in output.

Smallholder farmers depend on family labor to breed goat and farming activities so as to save money. Ekhoir et al. (2002) states that in any region of developing countries, small holder farmers own not as much as 5 hectares thus the researcher used the definition by FAO, 2014 for the study. This is so because the definition clearly highlighted that labor directly affects the productivity of small holder farmers. Small holder goat farmers play a vital role in supporting rural livelihoods by providing meat, milk, fertilizer and buffering against crop failure (Sekaran, Lai et al. 2021).Providing food for the household is the greater priority of smallholder farmers than profit maximization.

Small holder farmers are affected by ecological, demographical and socio-economic factors. The constraints affecting smallholder farmers venturing in goat breeding identified in the literature include poor nutrition, weak institutional support, high transaction costs, poor flow of information, small size of land, poor goat input and output markets, limited access to productivity enhancing technology, standards disease management and lack of access to education that help in developing and improving breeding practices.

2.3 Goat Production Systems

There are various goat production systems varying across the world and farms due to production environment, the agro-ecological zone, prevailing environment, purpose of production and available capital. Goat production systems positively impact the socio-economic development of the nation, as they can generate income and create employment in the areas of breeding, health and management (Haile, Gizaw et al. 2019). They also provide source of food security, as well as a buffer against poverty.
Mazinani and Rude (2020) states that most productions systems are a result of evolution in response to an increasing demand for goat products. Escarcha, Lassa et al. (2018) classified livestock production systems as solely livestock systems, landless ruminant systems, grassland-based systems and mixed farming systems. Sorely livestock systems is a production system whereby over 90 percent of dry matter fed to goats come from rangelands , pastures, annual forages and purchased feeds whilst less than 10 percent of the total value of productions comes from non-livestock activities. Landless ruminant scheme is a system whereby less than 10 percent of the dry matter fed to ruminants are farm produced and with an average annual stocking density above ten livestock units. A system known as a grassland-based production system is one in which farm production accounts for 10% of the dry matter fed to the animals, and the yearly average stocking density is less than ten animals per hectare of land. More than 10% of the dry matter given to animals in mixed farming systems comes from crop byproducts and stubble.

Rust (2019) classified livestock systems as grazing, mixed and landless systems according to stocking density per hectare and the proportion of farm-produced feed.
The grazing schemes are of low productivity and they cover largest area occupying 26 percent of the earth's surface. Yesuph and Dagnew (2019) stated that while landless systems are frequently used in places with high human densities, grazing goat systems are frequently used in marginal areas that are unsuited for agricultural production.

2.4 Socio- Economic Development

Many households in Zimbabwe, depend on goat farming and breeding as a source of wealth (Mandleni and Anim 2012). Goat breeding is a vital component in the agricultural economy thus positive and negative factors causing change in goat

number should be reviewed. These factors include increased income and economic growth, socio-cultural believes , farm size, grazing land available, labor available, access to information sources ,increased industrialization of goat production, increased demand for goat products due to increased human population (Ryschawy, Tiffany et al. 2021), changing food preferences, developments in breeding and genetics (Adkinson, 2013).

Goats are very crucial in the agro-pastoral production systems common in many smallholder farmers. Karthik, Suresh et al. (2021) revealed that the majority of small ruminants in the world (about 64 percent) are raised in mixed farming systems in developing nations. Goat breeding promotes social and economic development of smallholder farmers. Goat breeding is essential to finding a solution to the problem of food security in low income areas such as Mhondoro with people who survive on less than $1.25 per day. According to Sere' 2009, livestock contribute roughly 17% of the food's energy and roughly 33% of its protein consumed by humans thus economic importance of livestock to economic development cannot be overemphasized. Goat farming is essential to the health and economy of small holder farmers and Zimbabwe as the whole nation of through an important contribution to the GDP and export earnings of the nation. Goat breeding provides security against crop failure for the majority of smallholder farmers in Zimbabwe

2.5 Socio-Economic Factors and Constraints of Goat Production.

Socio-economic factors are the factors that directly impact income of smallholder farmer (Wahombe, 2012). They strongly influence the distribution dynamics and significance of goat diseases. Goat breeding in various countries encounters many negative and positive factors affecting goat breeding traits preferences and goat breeding practices. Mupawenda (2009), states that various social, global, economic, political, and managerial issues have an impact on livestock production. According to Josiane, Gilbert et al. (2020) small flock sizes, single sire flocks, problems with animal identification, suboptimal animal performance, farmers' illiteracy, and bad record keeping all contribute to the failure of effective small ruminant breeding practices in smallholder production systems. This study focus mostly on socio economic factors affecting goat breeding traits preferences and breeding practices.

Goat breeding is significantly impacted by rain and heat wave. Reduced rainfall and recurrent droughts were reported as major challenges to goat production due to their impact on pasture and water availability. High temperature stress directly affect livestock (goats) by disturbing the availability and price of crops used in feeding animals as indicated by Sejian, Silpa et al. (2021) highlighting that many crops will have yield losses associated with increased frequency of high temperature stress. Indigenous varieties like Mashona, which are well adapted to poor rainfall patterns, are raised by majority of small holder farmers. Survival of animals in the presence of multiple stresses (heat, poor nutrition, parasites and diseases) is one of the important traits.

Since the majority of smallholder farmers depend on farming for a living and are therefore unemployed, they heavily rely on extensive goat production. Extensive farming is whereby animals are confined in a small area for grazing or left to move freely around villages scavenging for feed (Molina-Flores, Manzano-Baena et al. 2020). Livestock farmers, according to Lewis (2022), are under increasing strain from a dry, unpredictable environment, bad economic conditions and land degradation. The goats are fed on natural grass and shrubs thus farmers prefer breeds that survive and thrive in the environment for instance goats with the ability to walk long distances grazing. They also prefer hard skinned goats which are high tick and other pests resistant thus preventing the outbreak of disease.

Livestock occupy much of the land for shelter and grazing. Goat breeding is largely affected by land degradation impacting economic performance of the nation. Land degradation is a result of overstocking beyond the lands' carrying capacity. Overstocking results in overgrazing thus exposing pastureland to erosion. Land is degraded by veld fires. De Araujo, Machado et al. (2021) discovered using experimental data and simulated models that land degradation had detrimental effects on goat production and economic consequences. Overstocking causes poor goat performance low profitability.

Goat production is vital in the economy and food security, for the animal to be productive in needs to be in good health. Parasitic infections can cause a wide range of health problems in goats, including gastrointestinal issues, poor growth, anemia

and death. These infections can also reduce milk production and decrease the overall quality of goat meat. As a result it is important for goat producers to be aware of the potential risks in order to take measures to reduce their impact on the animals. Ticks reduce meat, milk and leather production directly and indirectly. In addition, ticks cause skin irritation and inflammation, which can lead to reduced milk production and poor growth. Ticks are blood sucking external vertebrates that attach themselves to goats suckling blood to survive. According to L Mujuru (2019) the tick-borne disease that occurred in Zimbabwe in 2018 killed 50000 livestock. The disease occurred suddenly with goats dying rapidly leaving farmers with two options, to eat the meat or sell the carcasses at low price thus reducing the income. The communal farmers lacked money to buy vaccines and dipping chemicals thus promoting the outbreak and spread of tick borne diseases.

Poor breeding practices involve breeding goats without considering genetic selection, such as breeding animals that are related or breeding animals with health issues. This also includes random mating, mating goats with different body sizes and mating goats of unknown genetic backgrounds. Poor breeding practices result in decreased milk production, meat production, poor quality coat, increased disease and parasites, decreased health and well-being of the goat. Poor health and breeding practices cause accumulation of genetic defects thus reducing the quality of goat products.

2.6 Methods of improving goat breeding practices

2.6.1 Breeding strategies and improvement patterns.

Breeding strategies are strategies created to combine new technology with improved ones in order to increase the performance of current stocks (D'Alessandro, Cieplinski et al. 2020). They can also be defined as the incorporation of a breeding program's elements into a well-organized system for genetic improvement with the aim of maximizing a general goal. Breeding strategies are vital because they help to maintain healthy populations, increase genetic diversity and ensure that only the strongest and healthiest animals are bred. They also help to ensure that animals with desirable traits are passed on to future generations. Examples of breeding strategies include selective breeding, artificial insemination, cross breeding, and genetic engineering.

Haile, Gizaw et al. (2019) state that crossbreeding, selection between and within breeds help farmers genetically improve goat breed traits. These tactics, according to

Carles (1983), can be successful if the farmers have a good grasp of what traits are suited in the specific location being evaluated. It is also vital to firstly choose the most suitable breed then consider if the breed can be further improved within breed selection. Internal genetic development increase productivity and profitability for small- and large-scale livestock producers. This section highlights key points of success and failure of within-breed genetic improvement strategies for goats in smallholder farmers.

2.6.2 Extension Officers

Extension officers are facilitators and communicators, guiding farmers in their decision-making so as to ensure that the right knowledge is used appropriately for the best goat production. They facilitate communication between farmers and researcher on one hand, and between farmers and decision makers on the other hand. Fall (2000) states that extension officers enhance constant monitoring and evaluation by providing knowledge on breed characteristics. Extension officers improve goat breeding practices of smallholder farmers in the sense that extension officers propagate new farming techniques, consult and collaborate closely with farmers. They ensure that farmers' output, income and general level of living is improved in a systematic and participatory way by allowing feedback. Public and private sectors can both offer agricultural extension services. The public sector, on which this study is centered, consists of agricultural ministries and department s as well as agricultural research institutes.

2.6.3 Veld Management

Good veld management program result from assessment of veld conditions regularly for the ability to support a sustainable livestock production (Todd et al.,2009).Veld management ensures long term rangeland productivity, maximum outputs and consistent forage supply for goats. Good veld management promotes rotational grazing thus eliminating land degradation, a result of selective grazing.

Van de Pol and Jordaan (20008) stated that the most effective veld management practices include high-production grazing, controlled selective grazing, high-utilization grazing, and short-rotational gazing. High-production grazing method uses the veld sparingly. This method ensures that the most nutrient-dense and palatable grasses are lightly used, which benefits livestock performance. Controlled selective grazing is a system whereby palatable grass species are moderately used

while unpalatable species are not used .This system is similar to high production grazing in practice. High utilization grazing uses all available species in the sense that animals are compelled to utilize species they would normally ignore. This system ensures improved production and proper maintenance of veld condition.

CHAPTER THREE

3.0 Introduction

A cross-sectional characterization study of smallholder goat breeding practices and traits preferences was conducted in Mashonaland West Province in Zimbabwe. The breeding practices and breed preferences of smallholders are discussed in this research utilizing descriptive statistics and cross tabulation. The majority of the goats used to produce meat are from local breeds, and objective breeding techniques are rarely used. Goats are linked with arable systems and other livestock species in smallholder agriculture. Goats are typically grazed by smallholder goat farmers on non-arable farmlands like rocky and hilly terrain. All of the variables used for data analysis are presented and summarized in tabular style in this chapter. The design, sampling, data collection, and potential useful analysis methods used for this study will all be discussed in this chapter. This chapter's major objective was to explain the approaches and procedures used to carry out the study. This chapter included the theoretical basis for the research, the subject matter, data gathering methods, the kinds of data required, and an analytical framework. The data processing method was also carefully examined.

3.1 Study Area

The research was conducted in Mhondoro, Zimbabwe. The Council has two sub-offices, Turf and Kadoma, and its legal authority spans 9327, 41 km (Kadoma, Suzuki, Yoshikawa, Ui, & Kumagai, 2010). It is divided into 16 wards, which are designated as communal, peri-urban, large industrial farms, and resettlement programs. Manyewe Development Point is home to the Mhondoro Ngezi Rural District Council's office. Mhondoro-Ngezi District is a district of the Province Mashonaland West in Zimbabwe. With varying amounts of rainfall but normally receiving an average of over 750mm of rain annually on average. The winter months, June and July, are frequently very cold in this region, which is warm like most of Zimbabwe. The district gets a yearly temperature of 24.84 ^{0}C, which is warmer than the national average for Zimbabwe.

The Mhondoro Ngezi District's communities depended on vegetable gardening and subsistence farming for their livelihoods. Most families relied on open wells on dry river banks for domestic water use and for watering gardens during drought seasons. Diversification was recognized as a means of survival and included trade and hawking, wild fruit collecting and hunting, brick-molding, wage labor, and artisanal work. It was also discovered that the Mhondoro Ngezi District faced a sizable challenge from veld fires and environmental deterioration brought on by human negligence. In Mhondoro District, agricultural practices are considered essential for sustaining local livelihoods and well-being (Mitchell Mashizha, 2017). These agricultural practices are not just limited to providing sustenance, but are also a source of revenue and employment for the local community.

3.2 Research Design

A descriptive survey methodology was used in this study. A total of 40 small-scale goat farmers were chosen. The sample size chosen was proportionate to the total number of small-scale goat farmers in the local municipality. Primary and secondary data were both used in this research. Primary data were collected through interviews with smallholder sheep and cattle producers and the use of a carefully constructed questionnaire. Secondary data were retrieved from data that had already been published in books, journals, papers, and on the internet in order to create a baseline for comparison with the main data that had been collected. A study design is appropriate and required for data collection, classification, analysis, comparison, and interpretation, according to Kombo and Tromp (2006).

3.3 Data Type and Collection Methods.

The leaders of the rural households gave their consent to the data collection, and farmers and appropriate times and places were coordinated. An English-language, well-structured questionnaire was used to gather the data. Simple sentences were used in the questionnaire to make it user-friendly for respondents, and local concepts were used to make interpretation straightforward. Relevant information on land characteristics, socioeconomic and demographic characteristics, issues with livestock production, and livestock productivity was addressed in the subjects.

The study needed the use of primary data. Use of questionnaires with structured, open-ended and closed-ended questions allowed for the gathering of the necessary data. Each household served as one research unit for the purpose of gathering data. Some local community members who were assigned by the leadership of the community helped with the data collection procedure.

3.4 Sample Size and Sampling Procedure.

The number of observations or replicates in a statistical sample is known as the sample size. It is an important factor to consider when conducting research, as it affects the accuracy and precision of the results. According to Graf, Dykes, Damiani, Jonkman, and Veers (2018), the sampling method is a statistical analysis methodology where a preset number of observations are taken from a larger population in order to draw statistical conclusions about the larger population. It is a means of gathering information from a population in order to make generalizations about that population.

For the purpose of gathering the data, random sampling was used as the selection method. Random sampling is a sampling technique that involves selecting respondents at random from a sizable community. The importance of random sampling is that it helps ensure that the data being collected is representative of the entire population, rather than just a select few. Random sampling helps reduce bias and ensure that the data is reliable and valid.

Probability sampling techniques include random sampling. The research used a sample size of 40 household heads. The ward had an overall population of 815 goat farmers according to oral records like councilors and village elders. The researcher decided to utilise 40 respondents because they represent 5% of the population as a whole, in accordance with the statistical theory presented by (Abebe, Daniels, and McKean) that 5% of a population can be used to represent the complete population in a study and still be regarded viable.

The heads of the households served as the primary respondents in the survey, although in cases where they weren't available, their spouses or other family members filled out the form on their behalf. For this research, only primary data were gathered. Questionnaires, interviews and focus groups were used in this research because they are used to collect both qualitative and quantitative data, enable respondents to

express their opinions, attitudes and experience. The researcher used self-administered questionnaires ensuring that all questionnaires are standardized so that all respondents receive the same questions with identical wording. The questionnaires were also open-ended and closed-ended to collect quantitative data and have a clear understanding of the respondents.

3.5 Data Entry and Analysis

The SPSS program was used for data capture and analysis. Statistical Package for Social Science (SPSS) version 22.0 of 2013 was used to code and record the data that was acquired. For the analysis, the variables that best reflected the conditions that prevailed in the study region were chosen. Both qualitative and quantitative information was acquired, thus it was subjected to descriptive statistics, which were then presented as tables. The socioeconomic variables that influenced goat breeding practices and breeding traits preferences were identified using ordinary least square regression analysis.

Diagnostic Test

For accuracy and assurance the researcher used link test and multicollinearity test. Link testing involves putting a collection of units through their paces to make sure they work together properly. Additionally link test was used to check whether choice of words match the target group's own communication style , the questions are phrased positively and also whether the questions are formulated to avoid discomfort or defensiveness among respondents. The Variance inflation factor was used to assess for multicollinearity. It is possible to determine whether multicollinearity exists or not by using the VIF number, which ranges from 1 to 10.

3.6 Ethical considerations

In the field, where there was more contact with the community, ethical principles were put into practice throughout the data gathering to ensure that they were followed by all parties involved. According to Halushchak (2022), ethical principles ensure more reliable, transparent and trustworthy data collection. Furthermore, ethical data collections practices can help build trust between researchers and participants, as well as encourage participation in research studies.

CHAPTER 4

4.0Results

4.1Response rate

The percentage respondent according to the farmers they were sent to is clearly illustrated by the table below.

Table 4.1: Questionnaire Response Rate

Questionnaires Given	Questionnaires Responded	Response Percentage %
40	35	87,5

Source: Primary Data

4.2 Demography of respondents

4.2.1 Gender

Gender of respondents was shown as in Table 2.

Table 4.2: Gender of respondents

GENDER				
	FREQUENCY	PERCENTAGE %	VALID PERCENTAGE%	CUMULATIVE FREQUENCY
MALE	15	42.9	42.9	42.9
VALID FEMALE	20	57.1	57.1	100.0
TOTAL	35	100.0	100.0	

4.2.2 Age

The questionnaire required the respondents to state their age and the results are stated below. Majority of respondents were of 30 to 39 years (n= 11).

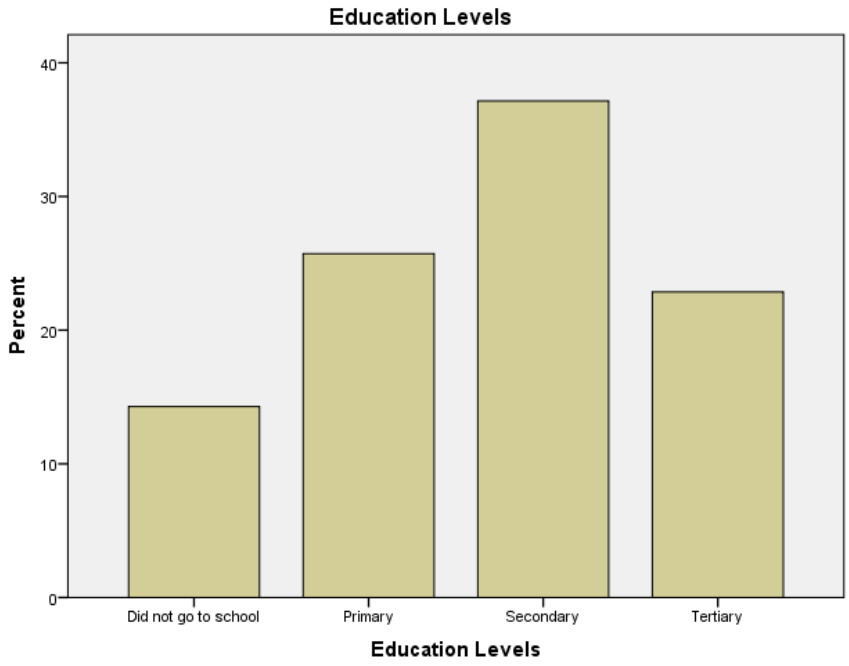
Table 4.3: Age of respondents'

AGE				
	Frequency	**Percentage %**	**Valid Percentage%**	**Cumulative Frequency**
15-19 years	4	11.4	11.4	11.4
20-29 years	6	17.1	17.1	28.5
30-39 years	11	31.4	31.4	59.9
40-49 years	5	14.3	14.3	74.2
50-59 years	6	17.1	17.1	91.3
60+ years	3	8.6	8.6	100.0
TOTAL	**35**	**100.0**	**100.0**	

4.2.3 Educational level

Level of education for respondents is as shown in Figure 1. The majority of the respondents got as far as secondary school (n=13 respondents).

Fig 4.2: Education level of respondents



Source: Primary Data

4.3 Livestock Information

4.3.1 Breeds kept.

The goat breeds kept by farmers are as shown in the Figure 2. The Breeds most kept by the farmers were Matebele (n=10) And Mashona (n=15). Farmers considered rearing indigenous Matebele and Mashona goats as source of income.

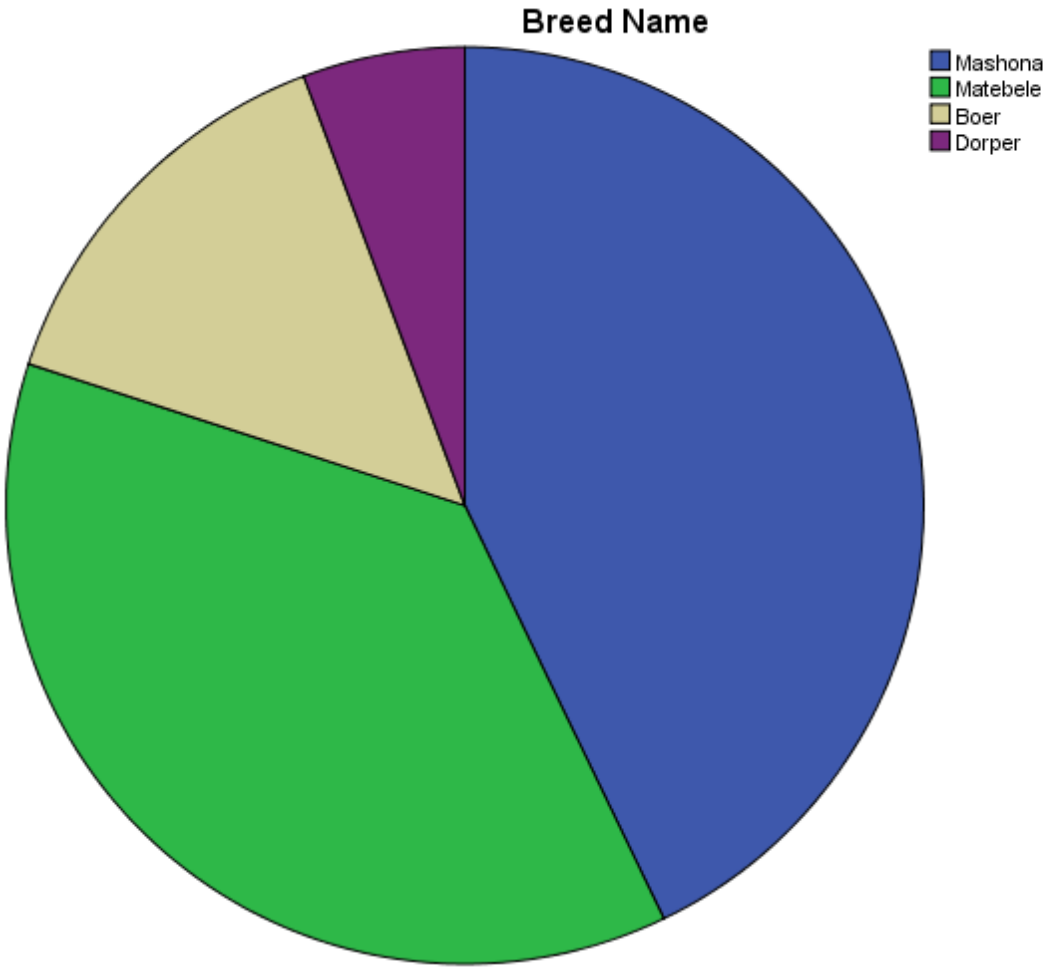


Fig 4.3: Goat breeds kept by farmers in Mhondoro

Source: Primary Data

4.3.2 Flock size

The size of the flock kept by farmers is as shown in Table 4. The majority of the farmers (n=13) kept goats at flock sizes 10-20 goats per household.

Table 4.4: Flock size

Number of goats	Frequency	Percentage %	Valid Percentage %	Cumulative Frequency%
1-10	10	28.6	28.6	28.6
10-20	13	37.1	37.1	65.7
30-40	9	25.7	25.7	91.4
40-above	3	8.6	8.6	100.0
Total	35	100	100.0	

Source: Primary Data

4.3.3 Purpose of keeping goats

Table 5 summarizes the reason why goats were kept by farmers. In the majority of the cases the major reason for keeping got was for house hold consumption (n=12) followed by source of income (n=8).

Table 4. 5: Purpose for keeping goats.

Reason for keeping goats	**Number of respondents**	**Percentage %**
Family consumption	12	34.3
Source of income	8	22.9
Religion /Rituals	5	14.3
Prestige / Status	6	17.1
Insurance	4	11.4
TOTAL	**35**	**100.0**

Source: Primary Data

4.3.4 Factors affecting goat breeds traits preferences and breeding practices

Factors affecting breed traits and practices are illustrated in figure above. Poor breeding practices (n=8) and lack of knowledge about breed traits (n=6) greatly affect goat production

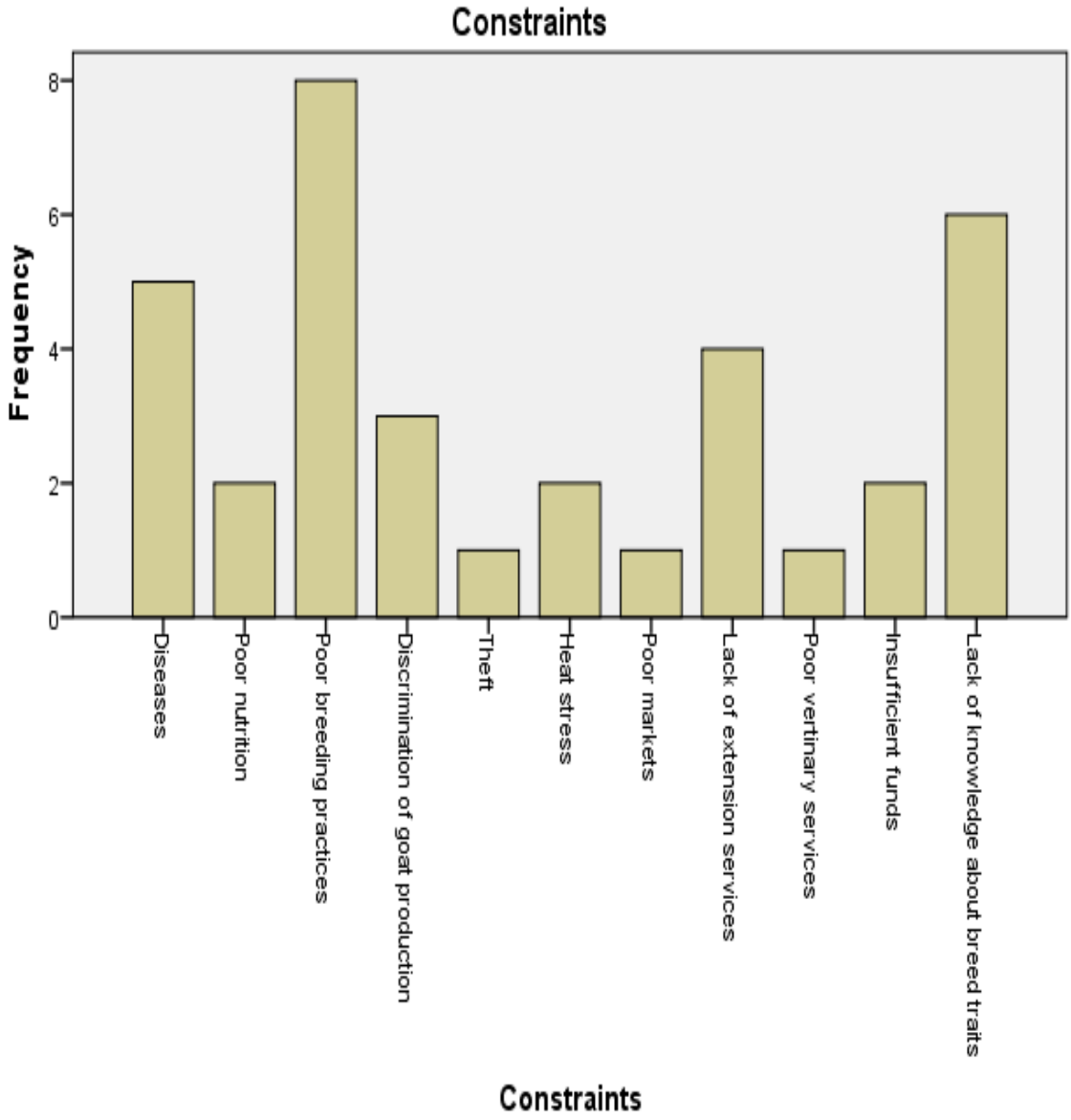


Fig 4.3: Factors affecting breed traits preference and breeding practices.

Source: Primary Data

4.3.5The preferred goat breeds traits preferences by respondents.

Most Respondents preferred mostly disease resistant (n=23%) and adaptability (n=20%) traits over other traits as shown figure 4 below.

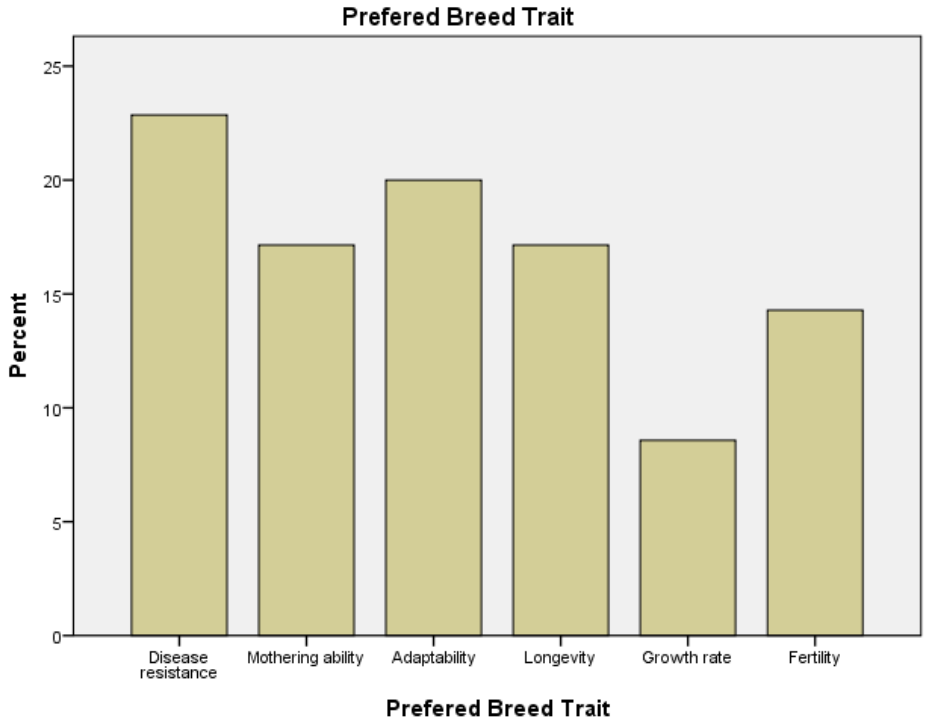


Figure:4.4

Source: Primary Data

4.3.6Preferred breeding practices

Table 4.6 below illustrates the breeding practices used in study area. The study discovered that natural mating (n=25percent) was broadly applied than Artificial Insemination (10 percent) due to minimum knowledge about AI.

Table 4.6: Breeding Practices

Frequency	Percent	Valid Percent	Cumulative Percent
Natural Mating	25	71.4	71.4
Artificial Insemination	10	28.6	28.6
Total	35	100.0	100.0

Source: Primary Data

Table 4. 7: Breeding Practices

Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**	
Uncontrolled Breeding	20	57.1	57.1	**57.1**
Controlled Breeding	15	42.9	42.9	**100.0**
TOTAL	**35**	**100.0**	**100.0**	

Source: Primary Data

4.3.7 Diseases

Table 8: Disease Names

Foot and mouth disease (n=12) is the most prevailing disease due to poor hygiene and housing goats closely together**.**

	Frequency	Percent	Valid Percent	Cumulative Percent
Foot and Mouth	12	34.3	34.3	34.3
Brucellosis	10	28.6	28.6	62.9
Mange	9	25.7	25.7	88.6
Poor management	4	11.4	11.4	100.0
TOTAL	**35**	**100.0**	**100.0**	

Source: Primary Data

CHAPTER 5

5.0 Discussion

According to Saunders and Lewis (2012), a response rate of 50% is favorable and 60% or more is preferable. This was presumably made possible by the curiosity that the research issue in animal production sparked in the minds of most respondents. However, the response received can typically be regarded as being representative of the population sample.

According to the data in Table 4.2 above, out of the 35 respondents who took part in the study, 15/35 (42.9%) of them were men, and 20/35 (57.5%) were women. Therefore, it is clear that the sample fairly represented each gender, and the results accurately matched the population as indicated by the distribution of males and females. However, this shows unequivocally that women make up the bulk of those who work in the goat industry. The results suggest that women have also taken action to enhance their lifestyle and the economy in the agricultural sector. Due to their desire to strengthen their economic independence and negotiating power inside the household, women tend to own goats more frequently than men do. This empowers women by allowing them to control small ruminants. The findings by Ara Parvin, Gulsan (2013) also indicated that women authorization in agricultural sector increases country economy by reducing food crisis.

Since the majority of young people in the area prefer the mining activities (Ngezi Platinum Mine) over goat farming, it is evident from the figures in table 4.3 that very few young farmers (14.3% and 28.5%) are engaged in goat farming. Younger people move to cities in pursuit of employment while older people (those over 30) stay on farms. This would imply that a more engaged group, who might increase productivity and commercialization, is being overlooked in the goat production.

It was important to consider the educational level the respondents. The graph (figure 4.2) above indicated that there is high literacy level in Mhondoro goat farmers. A high literacy rate is advantageous for increasing goat production since literate populations are more inclined to adopt and employ innovative breeding techniques that could help with commercializing goat production. This is in consistent with the research findings

from S Tsvuura(2021) who highlighted that more educated youth can understand the market structure, breeding traits of economic importance and best goat breeding practices better thus are expected to be more involved in goat production improving productivity. A small proportion of the farmers did not attend school thus, the levels of understanding by these agriculturists would probably be different in terms of administrative abilities.

The indigenous Matebele and Mashona goat breeds were found to be the most common ones raised by smallholder farmers in Mhondoro (figure 4.3). This study uncovered the reason for goat keeping, the methods used for breeding, the farmer's preferred breed, and goat trait preferences. Smallholder farmers, unlike commercial farmers, often raise goats for family needs rather than only as a business venture, thus they may not always be motivated to expand production, especially if doing so entails higher dangers. This finding is in align with L Westholm (2020) findings which states that smallholder farmers lack access to productive resources used in commercialized goat production. Family consumption was the primary motivation for goat keeping, hence the number of goats per home is statistically influenced by household size as highlighted by R Merkel (2019) by clearly stating that increase population require increased production. This indicates that, with all other conditions being equal, an increase in family size will result in an increase in the number of cattle due to increased labor.

Because of their excellent flexibility and disease tolerance, the majority of respondents expressed a strong preference for native Matebele and Mashona goats. A huge meat breed of goat is the Matebele. Mashona goats, with mature body weights between 25 and 30 kg, are mostly kept by smallholder farmers in Mhondoro (Shumba, 2003). This is supported by C Viser (2021) findings that indigenous goats possess a range of adaptive mechanisms that enable them to deal with harsh conditions. Due to the difficulties smallholder farmers encountered, including the lack of food and veterinary medications as well as a subpar management system, farmers tend to stick to Mashona breeds. Due to their high purchase and maintenance costs, Boer goats are mostly kept by smallholder farmers for commercial purposes. Most goat farmers (65.7%) have herds with less than 20 animals (table 4.4) due to discrimination on goat production and lack of education from extension officers.

Diseases, poor nutrition, poor breeding practices, prejudice against goat production, theft, heat stress, poor markets, subpar veterinary services, a lack of funding, a lack of extension services, and a lack of understanding of breed traits were challenges faced by farmers in the region who raised goats. During the survey the researcher observed that diseases, lack of extension services, poor breeding practices and lack of knowledge about breed traits were the major constraints affecting goat farmers in Mhondoro. Despite the variables affecting smallholder goat farming, 94 percent of the 40 farmers surveyed expressed a desire to increase their herds, and just 6 percent did not, citing excessive stock theft as the reason why they had no interest in doing so. Of the 94 percent who said they were interested in growing the stock, 42 percent said they would like to do it by learning more about cutting-edge breeding techniques. The majority (54%) said they will enhance their stock by obtaining both quality breeding stock and adequate funding. 2.0% of the farmers surveyed desired to fence off and create separate camps on their grazing grounds in order to increase the quantity of livestock.

For cattle improvement projects to be successful, farmers must be involved in determining breeding objectives and developing breeding programs (Dossa et al. 2009; Mueller et al. 2015). Smallholder farmers favor breeds with high carcass and body weight, good body conformation, flexibility to the environment, adaptability and resistance to illness, good mothering capacity, and drought tolerance, as shown in fig. 4 (Bhattarai et al. 2019).In the region, disease resistance and good mothering skills in goats were the most desired features by farmers, as seen in the table below. Due to the frequently harsh conditions, disease resistance has been noticed by smallholders in Mhondoro as an important characteristic.

The survey revealed that in order to create sustainable improvement breeding techniques for native goats, it is crucial to comprehend and take adaptive features into account in breeding procedures (Monau et al. 2020). Due to the fact that they can graze freely without a herd man, smallholder farmers chose goats with good mothering abilities. On the other hand, every responder who maintained an indigenous breed stated that access to better breeds and a lack of understanding were the main factors in their desire for an indigenous breed. They claimed that if they had

access, they would switch in commercialized, exotic varieties like Red Kalahari and Doper breeds. Additionally, they claimed that discrimination and financial constraints were the key drivers behind the preservation of native Matebele and Mashona breeds. The socioeconomic attributes of the head of home heavily influence the smallholder families' choice of desired traits.

According to the results, there aren't many smallholder farmers who use formal breeding techniques for subsistence breeding production systems. Illiteracy, poor record-keeping, a limited flock size, and the numerous functions goats serve in smallholder systems (such as serving as a source of prestige, insurance, and financial reserves) are among the potential causes of this condition. Poor goat output was caused by the fact that the majority of smallholder farmers lacked sufficient knowledge of the new breeding techniques and features that were economically significant. Due to limited access to artificial insemination services, few farmers used it. With only 30% of farmers having male goats, the majority of smallholder farmers were adopting natural mating, which led to a high rate of inbreeding and minimal genetic improvement. To prevent the spread of breeding illnesses, certain health precautions must be used when sharing males. Due to a lack of awareness regarding the use of artificial insemination, a lot of smallholder farmers engaged in natural mating. Many farmers claimed that because goats shared grazing grounds, goat breeding was largely uncontrolled. A.Nguluma (2022) and RP Badia (2009) findings also state that goat system is mainly extensive and also stated that breeding is uncontrolled.

The survey indicated that contagious diseases have serious economic consequences for the Mhondoro communal farmers and Zimbabwe as a whole through direct mortalities, abortion, lack of growth in young animals and measures taken by the authorities to limit or eradicate the disease. Diseases associated with poor hygiene are impacting smallholder farmers to a lesser extend because they require little attention as compared to contagious diseases (foot and mouth, brucellosis, mange). In this study farmers lacked the knowledge and resources for treatment and control of diseases because of poor availability and updating of veterinary services. These results are in consistent with those of B Nkonki (2019) who highlighted that farmers are short of knowledge and resources for disease treatment and control due to poor availability of

information. Smallholder farmers used locally available remedies and traditional medicines for curing and preventing diseases because of high costs of modern veterinary drugs (AG Bakare; 2020). For the animal health-related factor, the majority ranked foot and mouth disease as the most prevalent factor affecting goat breeding practices as shown in table 4.8.

CHAPTER SIX

6.0 Conclusion

The study's goals included defining goat production in the Mhondoro district, providing a clear understanding of goat breeding practices in terms of management, identifying the socioeconomic factors that influence goat production, identifying the relationship between socioeconomic factors on goat breeding practices and goat trait preferences, and outlining solutions to lessen smallholder farmers' vulnerability to socioeconomic factors. Comprehensive questionnaires were used to interview 40 smallholder goat producers in Mhondoro. Utilizing descriptive statistics, the questionnaire's data was examined.

6.1 Recommendations.

Grounded by the findings of the study focusing on socio-economic factors affecting goat breeding practices and breed trait preferences of smallholder farmers in Mhondoro, the following recommendations were made to ensure increased goat production.

- Improve veterinary and extension services: Extension agents should educate farmers on general management and breeding practices that improve their breeding practices.
- Provide loans and capital to smallholder farmers: The study made it abundantly evident that some breeds, such as Boers and Red Kalahari, are pricey to buy and require intensive care, which is made possible by capital (money). As a result, the government should provide smallholder goat farmers with access to loans through banks such as AGRITEX.. Additionally, the government can entice the business sector to fund smallholder goat producers. To increase the overall production of their goat herds, smallholder goat farmers use the cash to buy breeding stock, crawl pens, feed additives, and veterinary medicine supplies.
- Educate farmer: Training for increasing goat production is necessary in order to effectively improve the smallholder goat farmers' means of subsistence. Most smallholder farmers lack knowledge about the goat breeding traits of economic importance (longevity, adaptability, disease resistance and growth rate) thus there should be educated about those traits so that they prefer

economic important traits thus maximizing goat production. Farmers should be educated about how hybrid vigor is attained in crossbreeding. Most of smallholder farmers do not conduct Artificial Insemination due lack of knowledge thus educating them through raising campaign awareness conducting workshops.

- Vaccinating goats regularly: Disease is the most threatening hazard in goat production thus farmers should form a vaccinating program so as to eliminate disease occurrence.

6.2 Areas of further study

To maximize goat production efficiency, more research should be done on the socioeconomic issues influencing goat breeding techniques and the breed trait preferences of smallholder farmers. Further research is required on potential biotechnology breeding techniques that might be made available to smallholder farmers in Zimbabwe in order to enhance marketed goat output.

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RESEARCH QUESTIONNAIRE.

NO:

My name is **……..**, a final year student at Bindura University of Science Education studying BSc in Animal Science and Technology (Hons). As part of my studies, I am carrying out a survey research project with the title, **an assessment of the socio-economic factors affecting goat breeding practices and goat breeding traits preferences in Mhondoro district.** The questions on the questionnaire will be used in this study only and all the responses remain confidential. I …… will be held accountable for any information that will be leaked. The aim of the study is to improve goat breeding practices and breed traits preferences of communal smallholder farmers.

SECTION 1 : Demographic Information.

Date of interview: __/__/__/

Name of location/ ward number:.....

Male	Female

Gender

15-19	20-29	30-39	40-49	50-59	60+

AGE

EDUCATIONAL LEVEL	Did not go to school	Primary	Secondary	Tertiary

SECTION 2 : Livestock Information.

1. Which goat breeds do you keep?
- .....
- .....
- .....
- .....
2. How many goats do you have?

…….

3. What is the main purpose for keeping your goats?

1. Breeding Purpose	2.Source of income	3.Social Status	4.Savings

4. What is affecting your goat breeds traits preferences and breeding practices?
   a)…….
   b) ……
   c) ……
5. What are the possible causes of these factors?
   a). .....
   b). .....
   c). .....
6. Do you have any knowledge about the new breeding methods?
   .....
   .....,.....
   .....
   .....
7. What breeding methods do you use?
   .....
   .....
   .....
8. What diseases have affected your goat breeds?
   .....
   .....
   .....
9. How have these diseases affected your breeding practices?
   ……
   ……
   ……
   ……
10. What methods are you using to control the diseases?
    a. .....
       .....
    b. ....
       .....
    c. .....
       .....
    d. .....
       .....
11. Do you get advice from professionals?

Yes	No

11b. if yes, where do you get advice from?

Extension Officers	Private veterinary services	Non-governmental organizations	Social media

12. What assistance is being provided in controlling the tick-borne diseases?
    .....
    .....
    .....
    .....
    .....
13. What suggestions do you have in order to control the diseases?
    a). .....
    b). .....
    c). .....
    d). .....

Other comments.

.....
.....
.....
.....
.....

THANK YOU!