



BEEF CATTLE PRODUCTION AND MANAGEMENT TRAINING MANUAL FOR FACILITATORS IN COMMUNITY-BASED BEEF CATTLE PRODUCTION

Preface

This training manual was produced to share experiences gained over a number of years by practitioners in beef cattle production and management. The conceptual framework of the manual is based on the work of many development facilitators and writers in the field of beef cattle production and management. It was designed for the practitioner, trainer, as well as people interested in sustainable rural development, and specifically beef cattle production. Illustrations in the text are products of workshops and meetings with rural communities in beef cattle production across Zimbabwe, communities in Mbire District and government extension workers.



The structure of the training manual is such that, the facilitator is provided with the procedure for planning and conducting sessions on beef cattle production and management. Experience from the field shows that there are a number of potential benefits for the people who use the process described in this training manual. For the grass root communities, the manual gives them the skills to articulate their opinions, to identify and prioritise their problems and needs and most importantly, to seek ways and means of solving their problems and provide for their needs with or without outside support. Thus, the participatory process recommended in this training manual is a way of sharpening the communities' skills and empowering them to face challenges posed by beef cattle production in semi-arid areas of Zimbabwe.

For the development worker and extension staff, the training manual reveals immense knowledge and experience that the grass root communities possess. Given the right attitude, skills and environment, development workers and extension staff quickly learn that there is knowledge at the grassroots, although of a different form and nature from what they are accustomed to. With participatory training, this community knowledge can be identified and integrated in any joint development effort to improve livelihoods of rural households.

The process outlined in this training manual, if well applied, allows for participation and sharing of experiences through the use of diverse techniques. We hope the manual will make some contribution to rural livelihoods by strengthening beef cattle production and marketing activities and hence incomes.

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How to use the training manual

This training manual is for use during both training sessions and community meetings. The manual also provides a simple, easy to follow step-by step procedure to plan, conduct and analysis beef cattle production and management techniques with communities and also to design effective training sessions. The manual is illustrated with experiences gained from various beef cattle production efforts at grassroots level in Zimbabwe, and other African countries, such as Kenya.

The training manual is only a guide, and staff who use it should see it as an inspiration to switch on their own creativity to develop and experiment with new and appropriate approaches for more fruitful participatory interactions with the various communities with whom they work with.

And, the exercises and activities in the manual are not arranged in any sequence and they are adaptable to various situations in Mbire District. It may not be necessary to read the book from cover to cover, but it can be used as a guideline for specific activities.

Suggestions for using this manual

Beef Cattle Production and Management Training is normally conducted by a team of facilitators made up of subject matter specialists, extension staff and field workers, among other professionals. Development workers and extension staff who participate in provincial and district training teams can use this manual in two major ways. First, as a source as they conduct their trainings in the field, and second, as a training guide as they prepare others to plan and conduct beef cattle production and management training sessions. For those who have not been trained in participatory methodologies, it is advisable to arrange a brief orientation workshop in which principles and procedures in the manual can be learnt and practiced before applying them with a community group.

Introduction

More than two thirds of Zimbabwe's total area of 389 000 m² lie in semi-arid regions known as Natural Regions Three, Four and Five. These agro - ecological zones lie below 900m above sea level, and usually receive less than 600mm of rainfall per year. The main agricultural activity suited for these regions is livestock production. Crop production is too risky except for drought resistant small grains, cotton and guar beans.

More than 80% of the 5000 rural households in Mbire District of the northern Zambezi Valley own cattle, goats and indigenous poultry from which they derive the following commodities:

1. Meat
2. Milk
3. Hides and Skins
4. Manure
5. Draught power
6. Transport
7. Income
8. Socio - cultural aspects

Mbire District lies in agro-ecological Natural Region Four and receives less than 500mm of rainfall per annum and high temperatures of between 20 - 40 *DC*. Soils in Mbire are relatively unbleached, of high base status and have a moderate to high clay content. These soils have a very high agricultural potential but the main limitation is the aridity of the environment they occur. The district's semi - arid environment supports extensive woodlands of *Cotophospernum Mopane* (*mopane*) whose leaves have high protein content and high nutritive value for cattle and wildlife. The grasses that thrive in this area are highly palatable as implied by the generic name (sweet veld).

The major challenges these farmers face on beef cattle production; management and marketing are:

1. Poor animal health
2. Shortage of adequate grazing
3. High livestock mortality rate (20% per year)
4. Poor animal husbandry skills
5. Weak support from public and private institutions
6. Poor access to markets
7. Uneconomic livestock prices

To address these challenges, there was need to develop a beef cattle production and management training manual for smallholder farmers in Mbire.

To develop a consensus-training manual, a participatory workshop that involved all categories of the community by gender and socio - economic status, was conducted at Mbire District Development Association at Mushumbi Pools in October 2006. The purpose of the workshop was to review the current beef cattle production and management practices and their short-comings and come out with ways of:

- Strengthening community - driven animal health management practices;
- Strengthening the capacity of animal health support institutions for the provision of more effective and sustainable support to the community,
- Improving animal nutrition using guar beans and cowpea stover during dry months of the year when grazing is scarce; and
- Finding the most effective ways of bringing together beef cattle producers and buyers to collaborate and build sustainable marketing systems.

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Baseline information

The following information was collected from workshop participants who included smallholder farmer representatives from the 11 wards in the district, Agricultural Extension Officers, Veterinary Officers, Non-Government Organisations (NGOs) operating in the district and the Mbire Rural District Council leadership. The information below was collected through dialogue, individuals and group presentations:

Farmers' challenges to beef cattle production, management and marketing:

1. Lack of technical know - how on appropriate beef cattle management practices
2. Prevalence of diseases resulting in high mortality rates for cattle. Common diseases include:
 - a) Trypanosomosis
 - b) Redwater
 - c) Blackleg
 - d) Anthrax
 - e) Anaplasmosis
 - f) Bloat
3. Poor availability of dipping and handling facilities
4. Unavailability of veterinary services and medicines
5. Lack of markets
6. Burning of stover
7. Stock theft
8. Unavailability of pastures during the dry season (August - November)
9. Lack of water
10. Poor beef cattle prices as buyers dictate prices
11. Counterfeit drugs finding their way into the community

Challenges facing support institutions:

1. Lack of transport for effective extension delivery and support
2. Poor adoption of innovation by farmers
3. Destruction of tsetse control equipment by some local people
4. Lack of in-service training due to unavailability of funds
5. Qualified personnel are not prepared to work in the Zambezi Valley due to geographical marginalisation and harsh weather conditions
6. High staff turn - over
7. Poor communication systems in place thereby delaying swift extension delivery
8. Very high farmer - agent ratio resulting in most farmers not getting extension support at all
9. Very low staff motivation resulting in reduced morale and poor service delivery
10. Lack of accommodation for staff due to the above, and other reasons.

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Community-based interventions to challenges facing farmers

Challenges by priority	Interventions
1. Lack of technical know-how	<ul style="list-style-type: none"> • Farmers to organise training workshops • Farmers to face educational tours and shows • To develop a community information centre
2. Prevalence of diseases	<ul style="list-style-type: none"> • Farmers to protect tsetse control equipment from theft and vandalism • The Zimbabwe National Parks and Wildlife Management Authority to prevent wild animals from grazing in cattle pastures • Farmers to form disease control committees • Research should be conducted in the use of traditional veterinary medicines
3. Shortage of grazing	<ul style="list-style-type: none"> • Setting up of veld fire committees • Practice conservation farming • Encourage and keep stover • Growing of leguminous trees • Avoid destruction of bruise trees • Develop supplementary feeds from local resources
4. Poor markets	<ul style="list-style-type: none"> • Organise markets for livestock and other relevant committees • Farmers to create a marketing committee and a Commodity Association that link them to more demanding markets
5. Scarce dipping facilities	<ul style="list-style-type: none"> • Establishment of a veterinary medicine outlet in the community • Reduction of the size of herd appropriate to dip tank construction by authorities • Farmers to create microfinance programmes to purchase veterinary chemicals • Farmers to use carbaryl 85W on cattle to control ticks by using cup # 22 in a 15-litre Knapsack sprayer
6. Lack of water	<ul style="list-style-type: none"> • Maintenance of boreholes through Community-Based Management (CBM) outlet in the community • Drilling boreholes and wells • Water harvesting

Community-based interventions to challenges facing support institutes on beef cattle production and management

Challenges by priority	Intervention
1. Transport	<ul style="list-style-type: none"> Pooling of resources by NGOs and Government to implement programmes in targeted areas
2. Resistance or poor adoption by farmers	<ul style="list-style-type: none"> To use community – based and extension approaches that are results orientated Use existing local structures to influence adoption of technologies
3. Staff Training	<ul style="list-style-type: none"> Government and NGOs to pool resource and conduct training of trainers courses to staff in targeted areas To establish demonstration sites/plots so that staff can learn by doing To produce a beef cattle production and management manual to be used by partners, development workers, facilitators and farmers
4. Vandalism and theft of disease control equipment	<ul style="list-style-type: none"> Educate local people on importance of disease control equipment Train farmers on how to use equipment for tsetse control to instill a sense of ownership among local people. Work in liaison with law enforcement agents
5. Lack of trained personnel due to geographical marginalisation and harsh weather conditions	<ul style="list-style-type: none"> To influence agricultural training courses to have a quota system for students from these areas.
6. High farmer – agent ratio	<ul style="list-style-type: none"> Train lead farmers per targeted area for farmer-to-farmer technology transmission and Participatory Technology Development (PTD)
7. Poor communication system	<ul style="list-style-type: none"> Use local communication structures from war to village level Liaise with the Zimbabwe Republic Police and other support institutions who have radio communication systems

Monitoring

Compilation of a training manual, implementation of the training guidelines and success of the programme will be measured by a set of indicators (Both Long and Short Term). As a way of doing this, there is a need to carry out a survey/measurement twice annually to measure the following indicators:

- Reduced beef cattle mortality rates
- Increased livestock weight
- Reduced disease incidence
- Increasing livestock herd
- Improved meat quality
- Higher returns from beef cattle

- More draught power
- More land cultivated
- Increased crop production
- Increased household income from crop production
- Increased food security
- A viable local livestock market
- Functional farmer groups in every ward
- Livestock feed demonstrations
- Research on use of traditional methods on control of cattle diseases

Training methodology and tools

The training should involve theory and practical sessions using participatory tools and methodologies that include:

- Question and answer sessions
- Group discussions
- Lectures
- Case studies
- Visual aids

Practicals should include:

- Hands on implementation of technologies by farmer groups in every ward
- Field days and field visits
- Demonstrations
- Veterinary clinics
- Refresher courses
- Farmer competitions
- Agricultural Technology Shows/ Fairs

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Chapter One

Beef breeds in Zimbabwe and breeds suitable for the Zambezi Valley

Introduction

A wide range of beef breeds are found in Zimbabwe but not all the breeds can virtually suit every type of environment and/or breeding programme. They can be classified into three broad types: the zebu type breed (*bos indicus*) the British breeds (*bos taurus*) and the continental large exotics (*bos taurus*).

Bos Taurus (Exotic)	Bos Indicus (Indigenous)
Aberdeen angus	Africander
Sussex	Tuli
Shorthorn	Mashona
Hereford	Brahman
South	Nkone Devon
Charolais	
Simmental	
Senepol	
Limousin	

Objectives:

By the end of this session, participants should be able to:

- Outline characteristics of various beef breeds found in the Zambezi Valley
- Identify breeds suitable for their specific areas of production and farming systems

Tools:

Pictures, Flip charts, Markers and Map of Zimbabwe.

Time:

1 hour

Method:

Group Discussions

Divide trainees into groups of four and ask them to discuss characteristics and list beef breeds in Zimbabwe and those suitable for the Zambezi Valley.

Back in plenary, write down all the characteristics of identified beef breeds and their suitability to

the Zambezi Valley. The following beef breeds of cattle are found in Zimbabwe and classified as either exotic or indigenous.

The exotics are animals that have been imported from Europe and America and the indigenous were developed in Africa.

Specialist breeds

The specialist breeds include the breeds such as the Aberdeen Angus, Hereford and the Sussex. These are breeds, which are specifically for beef production as they have a high feed conversion efficiency and are most suitable for pen fattening.

Dual-purpose breeds

These are breeds which can be used for both beef and milk production such as the South Devon and the Simmental breeds.

Zebu British synthesis (crosses)

These have been developed from crosses between the indigenous and the exotics. These thrive well in the Zambezi Valley due to their inherent characteristics of both indigenous and exotic beef cattle.

Breeds suitable for the Zambezi Valley

Characteristics of Mashona Breed:

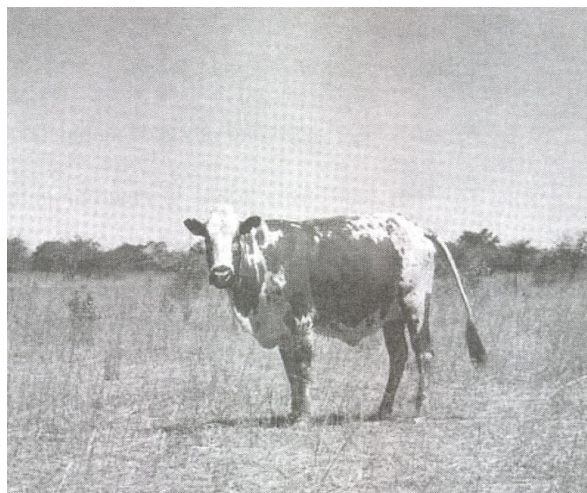
- They are a small-framed breed
- Have early carcass maturity and a high dressing out percentage
- They are hardy with a high degree of fertility
- Better disease resistance
- Have excellent cow fertility and calf productivity
- Mature early and adapt to high temperatures
- A short oestrus cycle and high calving percentage even under harsh conditions
- Calving difficulties are very minimal
- Have a docile temperament, which allows for ease of handling
- They are good grazers and make use of poor grazing conditions
- They are not good for pen fattening, as they are prone to laminitis when they are enclosed in pens and fed on high diets
- Range in colour from black, dark brown, red, red and white



Characteristics of Nkone

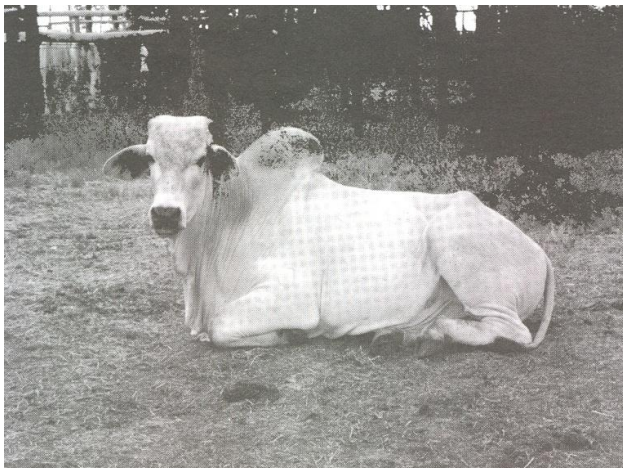
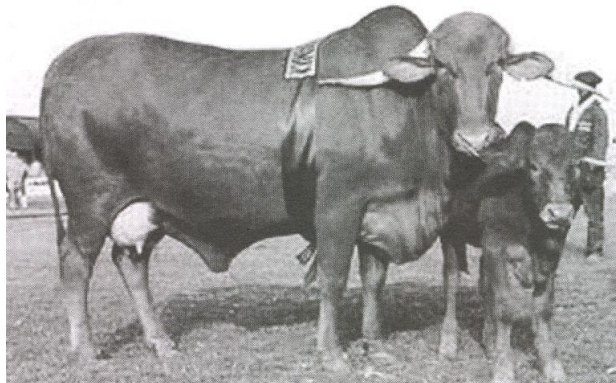
Breed:

- They are off medium size
- Highly fertile
- Superior mothering abilities resulting in a high calf survival
- Instances of difficult birth (dystocia) are very minimal
- Ease of calving in cross breeding systems
- They are hardy and can easily adapt to harsh conditions
- They have a good longevity
- Average growth rates



Characteristics of Africander Breed:

- They are hardy animals particularly adapted to arid and dry conditions
- They are good grazers and make use of poor grazing conditions
- Not suitable for pen fattening, as they are prone to laminitis.
- They are slow maturing
- Slightly less fertile than other indigenous breeds
- The cows produce very good calves when crossed with other breeds particularly the larger exotic breeds such as Charolais and South Devon

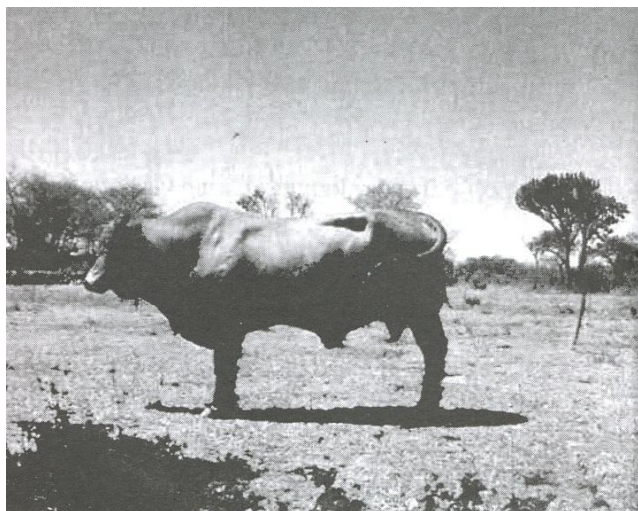


Characteristics of Brahman Breed:

- They have bigger and very good mature body sizes
- They can easily adapt to environmental changes/challenges
- Have average growth rate
- Calving difficulties are very minimal
- Have good cow fertility and productivity
- Have good disease resistance

Characteristics of Tuli Breed:

- They are hardy and can withstand dry dusty conditions
- High fertility
- Good mothering ability, weaning well grow calves yearly
- They are of outstanding longevity
- They are of average growth rate and reach sexual maturity at a young age
- More resistant to ticks and good drought tolerance
- Adapt to high temperatures
- Produces good carcass with good meat quality



Characteristics of Simmental/ Breed:

- They are true dual-purpose breeds with excellent beef and milk production
- Good milk producers and therefore a good breed for production of weaners
- They have a good mature size and have a high dressing percentage
- They are sensitive to harsh conditions but adapt easily
- The cows are heavy milkers with lactation yields of 4500kg or more milk with a high butter fat content
- A deep reddish brown colour with a white
- Horned

Summary

It is very important for farmers to know specific agro ecological conditions and characteristics before selecting beef cattle breeds prior to sustainable production and management. The Zambezi Valley is one such example.

Chapter Two

Handling and kraal facilities

Introduction

Management of cattle involves dipping, hand dressing, vaccination, branding, weighing, dehorning, castration, earmarking, pregnancy testing, drafting, loading and treatment of sick animals. This requires that cattle are handled about 50 times per annum. Cattle management starts with a properly designed kraal that has plenty of room for the number of cattle that will use it 2-3 square metres for each animal.

Objective:

By the end of this session, the participants will be familiar with:

- The importance of good handling facilities
- Castration
- Dehorning methods
- Dosing
- Dipping
- Weighing
- Choosing sites
-

Materials:

A picture showing different handling methods; burdizzos, flip chart and markers, dehorning iron, elastrator ring and applicator, knife, dosing gun or bottle, weighing band

Duration:

1 hr

Method:

Group Discussion

Divide the participants into three groups and ask each group to discuss the following questions:

Group One: What do you know about castration and what is its importance?

Group Two: What do you know about dehorning and what is its importance?

Group Three: What do you know about dipping and weighing? What is their importance?

The groups share the results of their discussions in the plenary. Give a summary on the flip chart.

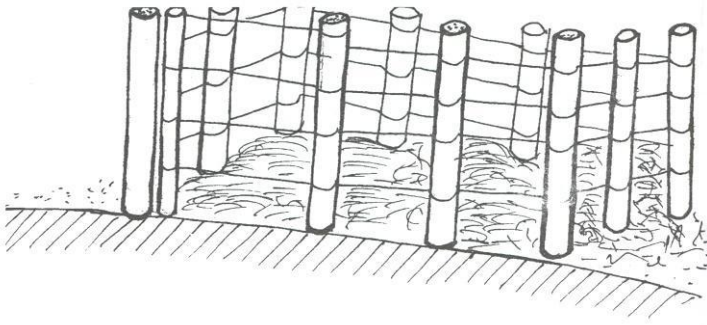
Demonstrate to the participants how to perform castration and dehorning.

Important considerations in handling facilities

Site

Choose a site that is accessible by cattle and motor transport. The slope should ensure surface drainage (2-3%), have a well-drained soil type where the work area can back into the prevailing wind; have adequate shade and a nearby permanent water supply. A shade is necessary (east to west 2,5m height). Protection is also important (kraals should be built on western side of a natural shelter, for example, a bush, to protect animals from western winds)

A pen on slight slope



Location

The greater the distance cattle travel the greater the expenditure of energy. Facilities should be sited as near equidistant as possible to all areas served by them.



Pen with a race on one side not far or too near from homestead

Design

The design should allow for a well-organised flow of animals with least disturbance and minimum possible injury. There should be a vantage or control point, from which the whole layout is visible, to enable adequate supervision.

Rectangular or triangular pens have been the norm in Zimbabwe. A minimum of two kraals is recommended. This allows for rotation of cattle from one kraal to another during the rainy season. A cattle race measuring up to 5 metres can be constructed on one side of the kraal.

Dimensions

The following areas in square metres per head are recommended

Holding pens

2.5sq metres per head (worked immediately)

6.0sq metres per head (detained overnight)

Calf pens

0.6 sq metres per head

Using the above, handling facilities can be built to satisfy herds of varying sizes, but the capacity of holding and forcing pens should be no more than 125 head. Bigger herds are more difficult to control and more prone to disturbance - fighting, butting etc, which can cause injury and sometimes panic.

Components of a proper handling facility

The race

Ideally, a race 5m long and 0.75m wide holding 2 to 3 animals is recommended. The race should be used regularly, preferably at each muster to ensure that animals, especially the

young stock, are thoroughly accustomed to the procedure and are less inclined to attempt to turn around in the race.

Bale

The bale must be of robust construction as this is the piece of equipment that takes the greatest pounding from animals.

Loading rump

Farmers can use existing loading rumps within their locality.

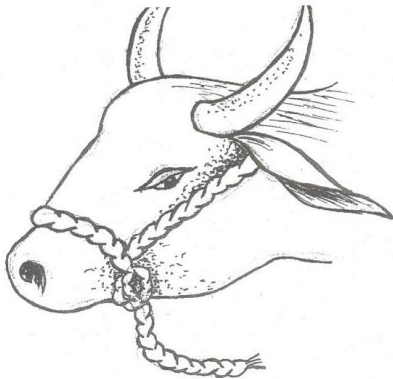
Cattle handling techniques

For animals that don't have horns or that resist being held by them, put your fingers in its nose like this. Pull the head close to you to hold it firmly.

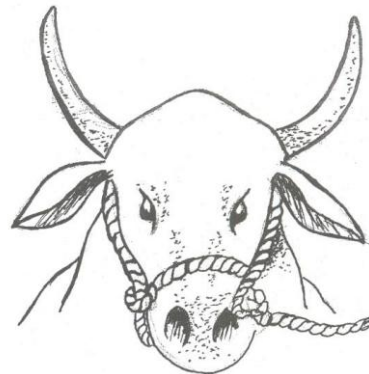
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You can hold an animal securely or tie it up with a halter as illustrated in 2 or 3.

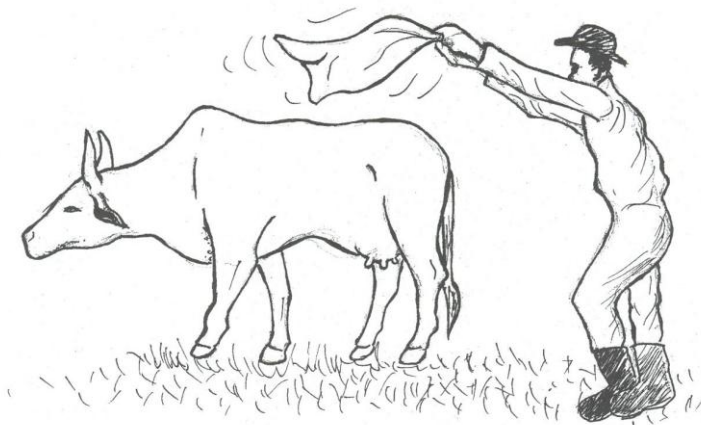


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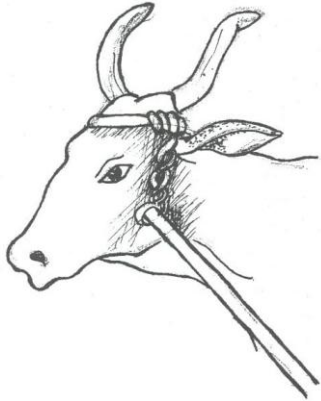
A piece of cloth on a stick stops cattle moving forward.



4

Leaving a long stick tied to the horns to manage bad-tempered cows help to catch and handle the animals safely.

5



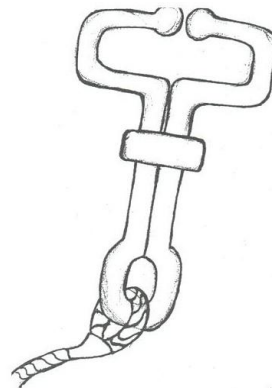
Or grip the animal's jaw like this.

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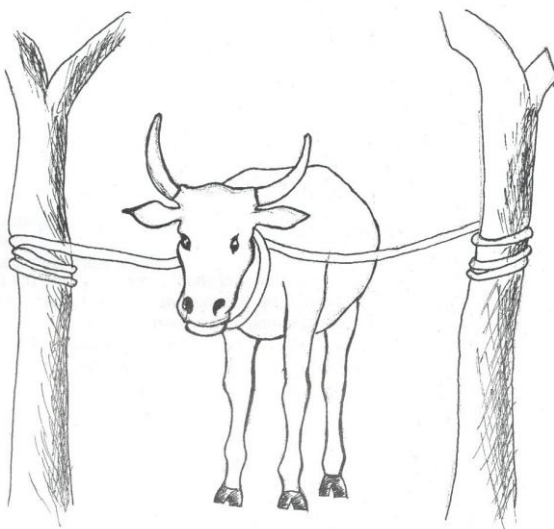


Some people use a tool like this nose-ring with a rope attached round to it to hold the nose of very strong cattle.

7



Tie an animal between two trees.



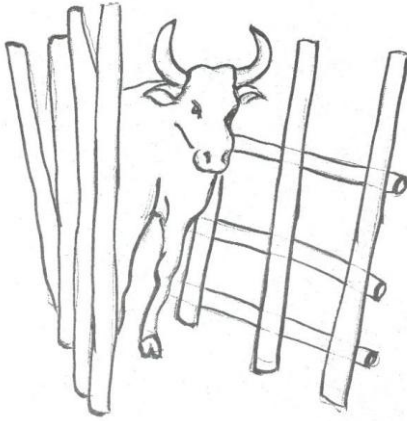
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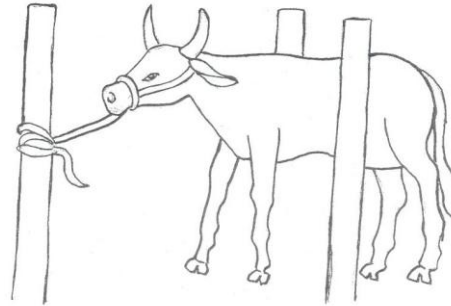
Make a simple race and crush.

Use three poles to hold an animal.

9



10



Routine practices

Castration

Reasons for castration

- This is a means of preventing inferior male animals from breeding (reproducing)
- It is done to induce docility in male animals
- Castrates are easy to feed: there is no fighting in pens hence they spend more time feeding than fighting
- Castrates tend to produce tender and fatter meat at mature age
- Castration is also done to prevent the strong odour in meat, which may not be desirable.

One would benefit from delaying castration because the longer the time before castration the higher the weaning mass and subsequent gains. The table below best illustrates this.

Castration age	Birth mass	Weaning mass	Gain
Birth	32	170	138
3 months	33.2	174	140.8
6 months	32.6	186	153.4

But, as the animal gets older, the more traumatic castration becomes. Castration is generally done at the same time as dehorning.

Castration methods

1 Burdizzo's forceps method

This is done by pulling down the testes and holding the spermatic cords between the jaws of the forceps. The jaws are then closed and then given a jerk to completely sever the cords. This is the most suitable method for beef, it is fast and bloodless and requires some skill. It can be at the same time as dehorning or 2-3 months of age.

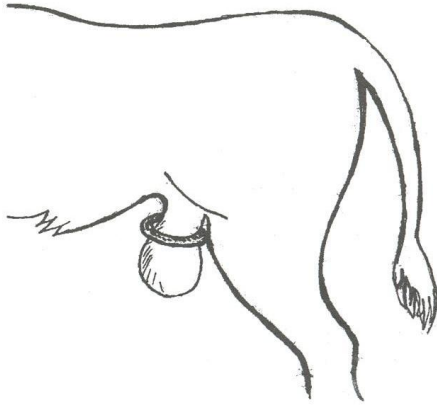
2 Knife method

This is done by incising the bottom of the scrotum and pulling out the testes. Then rub the knife against the spermatic cords until they break. This method can be used at any stage. But it is illegal to castrate an animal that is more than 12 months old without the use of anesthesia. This method requires some skill and is slow. It also requires the use of chemicals to treat the opened wounds.

3 Elastrator ring method

This is slow and should be done within the first week of life. It is more painful. It involves putting a rubber ring (elastrator ring) such that the testes are below the ring. This stops blood flowing to the testes, which eventually die and drop in about two weeks. The rings must be close to the body.

Elastoring Ring Method



Dehorning

The principle is to cauterize the horn bud and the surrounding skin. If this is not properly done, you get scar or deformed horns.

Dehorned animals are easier and safer to work with than horned animals. There is reduced damage inflicted without horns to the skin and udders. Dehorned animals require less space in terms of feeding space, transport space in the truck and floor space.

Generally, it is done within a few months after birth or when the horn buds can be felt to about 5mm long.

Dehorning calves

Calves should be dehorned when the horn bud can be felt, but preferably within a month after birth. The principle of dehorning is to cauterize the horn bud and the skin area surrounding it. If the horn bud and skin are not properly cauterised malformed horn growth will be produced.

Dehorning older cattle

Horn growth up to 50mm in length may be removed close to the head with a sharp knife. Cautery of the wound and surrounding skin will prevent further growth.

Dehorning methods

Hot iron methods

The iron is heated by gas, fire or electricity. The electricity and gas are preferred as they produce a constant heat. The iron is heated to a dull glow. It is applied with circular motion for 3-5 seconds (not twisting motion). Guillotine dehorner can be used first if the base of the horn is too wide for the iron. For fully-grown horns, a surgical wire or saw and local anesthesia are used. To reduce bleeding, you can use hydrogen peroxide and try to do it in winter. The dehorning wounds should be checked regularly.

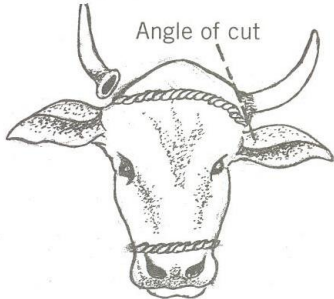
Chemical dehorning

This is done using a caustic soda/ sodium dioxide or some branding liquid. This is done within 2 days of birth. First, you have to clip all the hair around the horn zone. This method is not commonly used because animals are likely to rub off the liquid on to other parts of the body and cause skin burns.

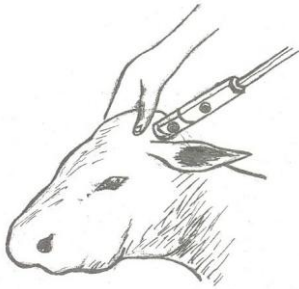
Surgical wire or guillotine saw

Fully-grown horns may be removed with a guillotine saw or surgical wire close to the head. Where horn growth has developed to the stage where the base is too wide for hot iron dehorning, this method is recommended but the use of a local anaesthetic entailing the services of a veterinarian is necessary. Bleeding can be reduced by swabbing the wound with hydrogen peroxide. Protection against infection and insect worry is necessary until the wound has formed a hard crust or scab.

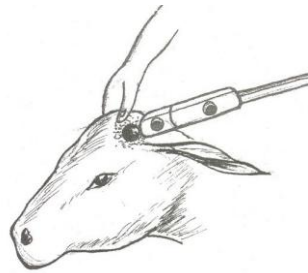
Dehorning an adult animal



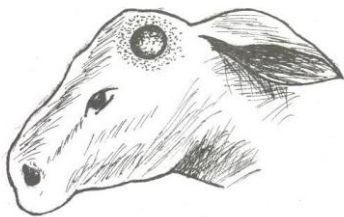
Dehorning a young animal (the hot-iron method)



1. Put the end of hot iron over horn



2. Move the iron round to loosen the horn

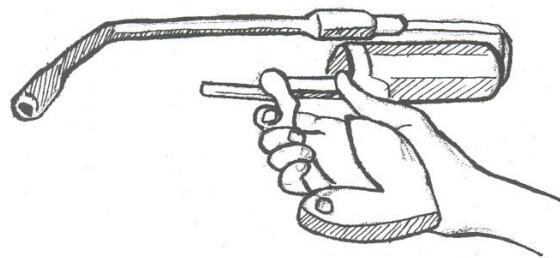


3. Scrape the horn out completely

Dosing

- Farmers to follow proper dosing intervals to control internal parasites
- Strategic dosing involves dosing cattle for every change in season

Drugs in liquid form may be administered by mouth, using a long-necked bottle or dosing gun. When administered as a drench, raise the animal's head slightly and slowly and administer the fluid into the side of the mouth, allowing the animal to swallow freely. If the animal's head is raised too high or if the tongue is pulled out, it interferes with normal



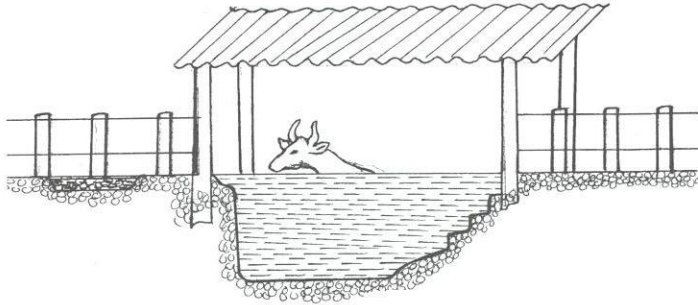
A dosing gun

technical guide

swallowing and could cause the drench to enter the lungs. The resulting pneumonia can be fatal. Dosing guns should be checked periodically for accuracy.

Dipping

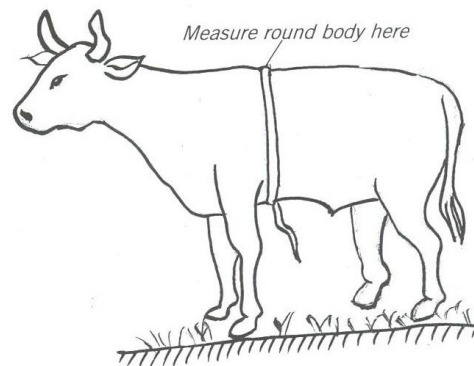
- Tick control (spraying / plunge dipping)
- Correct dip must be used
- Follow dipping intervals
- Dipping programme should be planned according to acaricides used



Cattle being dipped

Weighing

Weighing of different classes of cattle at various stages is essential for the efficient management, supplementary feeding and selection of cattle. However, weighing should be kept to the minimum that is necessary, and often only a sample of each herd need to be weighed. If a sample is weighed, this should be at the same marked sample of approximately 30 herd or 10% of the herd whichever is the greater. Animals should be weighed at the same time of day under conditions as constant as possible.



To estimate the weight of an animal without weighing it

- Make the animal stand on level ground and put a measure (or use a piece of string and measure it against the ruler on this book) round its body just behind the front leg.

Estimated weights of animals

Distance round the body in cm	Approximate weight of cattle in Kg
70	40
75	45
80	50
90	70
100	98
120	150
140	232
160	330
180	485
190	558

Body condition assessment

All cows should be condition scored shortly before calving, at start of the bulling season and at weaning or start of the drying season. In addition, a sample of cows should be scored at about monthly intervals. This will provide information that is invaluable in achieving optimum condition for higher fertility, provides a guide to supplementary feed levels, a check of summer performance, and can be used in culling and selection.

Summarise the lesson by discussing with the participants the following:

1. What is a burdizzo and how is it used? Why is it important to cattle?
2. What are the recommended dehorning methods in Mbire District?
3. How do local cattle producers house their animals?

Using the information provided in this session, discuss in detail: castration, dehorning, dosing, dipping, weighing and handling facilities.

Summary

The chapter has provided an insight into the recommended construction of handling facilities and routine management practices that are used for beef cattle production. Farmers should strive to adopt and adhere to these best practice methods to improve on their beef cattle production and management.

Chapter Three - Reproduction in beef cattle

Introduction

Most communal farmers run bulls with the cows throughout the year, claiming that higher calving rates can be obtained and that bull requirements are reduced. This is however, not desirable since controlled breeding can be practiced resulting in restricted calving season - even more - batches of animals produced and routine management practices become easy.

Objectives:

At the end of this chapter participants should be able to:

- Understand bull selection methods and management practices
- Understand heifer selection and management practices
- Detect different signs of heat in cows and heifers
- Appreciate principles of calving, calf rearing and management

Tools:

Pictures, markers, flip charts, rulers, strings, one bull, one cow, two calves, two weaner plates and two bottles.

Method:

Brainstorm, demonstrations and discussions.

Duration:

2 hours.

Brainstorm

Ask the participants to list various bull and heifer selection methods they use in the Zambezi Valley and signs of heat in cows and heifers. Write down their responses on the flip chart.

Demonstrations

- a) Carry out a breeding soundness evaluation exercise as illustrated in this section.
- b) Carry out colostrums feeding and weaner plate application demonstrations as illustrated in this section.

Practical

- a) Take the group to the available herd of cattle and let them practice in groups as demonstrated.

Breeding season management

The breeding season should be as short as possible without reducing calving percentages. The length of the breeding season for heifers should be approximately nine weeks. For maximum profitability, the breeding season should be adjusted so as to make optimum use of the cheapest source of the summer grazing.

The table below illustrates the appropriate breeding and calving seasons:

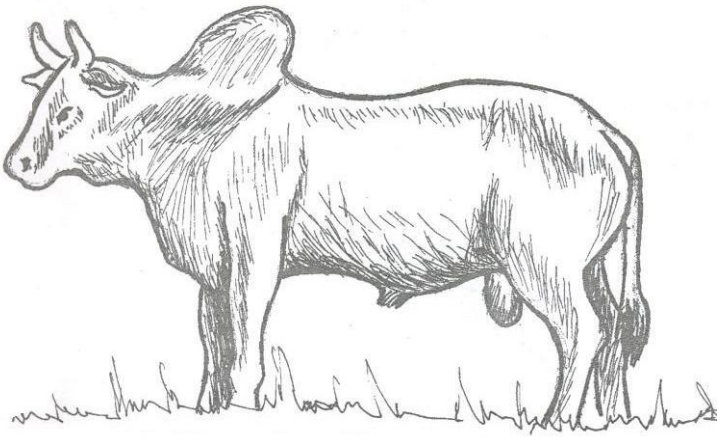
Region	Bulling Season	Bulling Season
High veld	Nov 15 – Feb 13	Sept – Oct – Nov
Low veld	Dec 15 – Mar 16	Oct – Nov – Dec

It is desirable to separate heifers during bulling and calving and for mating 4 to 6 weeks earlier than the cows to allow closer supervision during calving. Appropriate calving time is 6-8 weeks before adequate green grazing can be expected. Calves born later than this are too small to utilise fully the milk potential of its dam grazing on the early green lush. The late calf is susceptible to scours, sweating sickness and parasites. Therefore, it is clear that calving season should be centred approximately 2 months before adequate green grazing can be expected.

Bull management and selection

The growing bull is much more susceptible to nutritional stress than the mature bull. When mature bulls are fed, low energy feeds for prolonged periods, libido and testosterone are affected much earlier than semen production. The effects of underfeeding may be corrected in mature bulls, whereas it is less successful in young animals because of permanent damage to the testis. Obesity and over-feeding reduce libido and sexual activity in bulls, particularly during hot weather. Mature males should be restricted to a maintenance diet. When not in the breeding herds, bulls should preferably be run as a separate group in two or three small paddocks where they can be closely monitored. The number of cows per bull is an important factor as it affects the calving percentage. A bulling ratio of one bull to 25 cows is recommended. When selecting a bull for breeding purposes the bull's performance records have to be checked on the basis of its offspring. Therefore, the performance of its progeny will determine its performance as well. There are other features (body conformation), which can be selected for. Such features include:

- Strong and straight (stiletto) legs
- The penis and scrotum should not be pendulous
- It should have a wide and moist muzzle
- The bull should be masculine



A bull in good condition

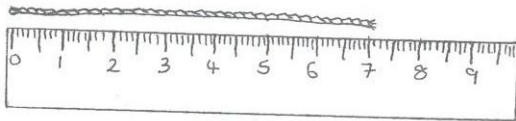
Before commencement of the breeding season, bulls should be checked for fertility by a veterinarian.

Breeding soundness evaluation of bulls

A breeding soundness examination predicts the potential fertility of a bull. It is based on an examination that includes tests for physical soundness, testicular size, semen quality and in some cases, libidomating ability. There is a high correlation between scrotal circumference and quantity of sperms produced. Most importantly, the larger the scrotal circumference the quicker the bulls daughter reach puberty and start cycling, provided that nutrition is adequate.

Evaluation using scrotal circumference

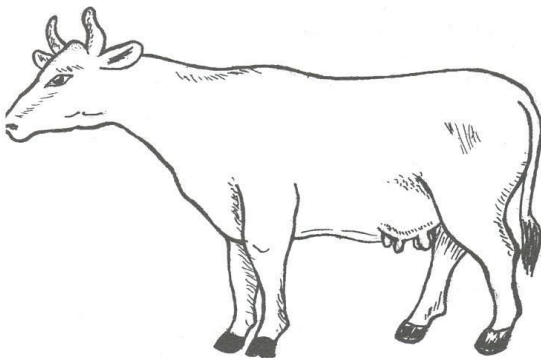
a) Selection of bull using scrotum circumference



b) Measuring the circumference of the scrotum

Heifer management and selection

Replacement heifers have been called the "backbone" of our future cowherds. Heifers need to be fed in such a way that their mammary systems develop in preparation for lactation. They need not be fed with a lot of concentrates so that they would not become too fat since this would adversely affect their reproduction. Their body condition has to be maintained at 3-3.5 and high live weight at calving. Heifers of large breeds usually reach puberty at 270kg and smaller ones at 240kg.

*A heifer in good condition*

Traits of economic importance in heifer selection

Age at puberty is most important as a production trait when heifers are bred to calve as two year olds and in systems that improve restricted breeding seasons. The main aim of selection is to identify superior animals and to use them for breeding, so that efficiency and profitability of the herd are improved. Therefore, a breeding cow should meet the following criteria:

- Fine appearance, not too fat nor too thin, smooth and thin skin, glossy hair
- Head is clean - cut, broad muzzle, neck is a good length
- Chest is wide and deep, rib bones are wide, flat, deep and slanted towards the ear
- Legs are strong and straight, rump is long, wide and not steep
- The rear udder is wide, with squarely spaced teats of medium length and with superfluous teats. The skin of the udder is loose and thin
- Head, neck, body and shoulder are well proportioned

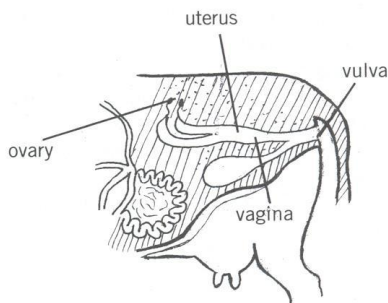
Oestrus/heat period

This oestrus period is the time when a cow will stand when mounted by either a cow or a bull and there will be higher chances of conception.

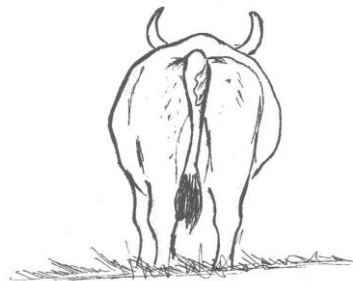
This period averages about 18 hours and is somewhat shorter in heifers.

Heat Signs

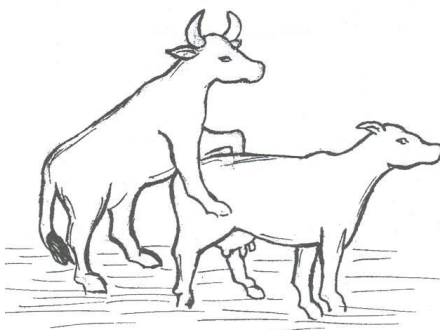
- Cow mounts other cows
- Cow is very nervous
- Swollen vulva
- Clear watery mucus on tail or flanks
- Cow stands still while being mounted
- When mounted it stands still



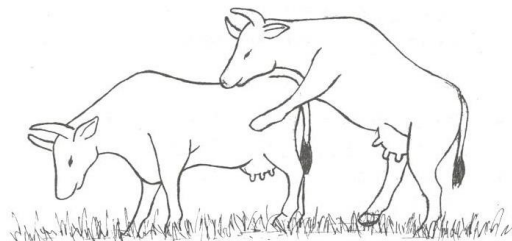
Swollen vulva



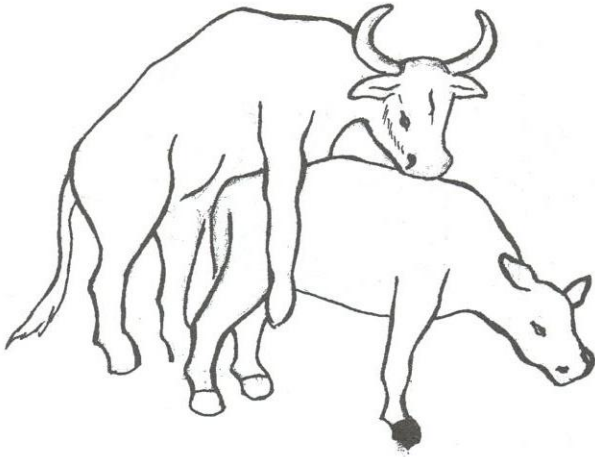
Clear watery mucus on tail or flanks



Cow stands still while being mounted



Cow mounts other cows



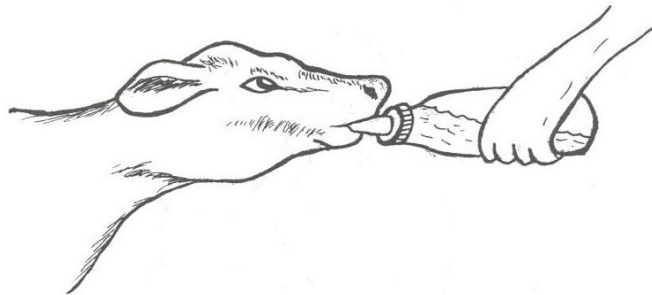
Cow on standing heat being mounted

The best time to breed when using a bull:

- Later in the oestrus period
- Mucus discharge is thick and stringy
- Vulva still swollen
- The cow will be quiet and settled

Calf rearing

The productivity of individual cows and whole herds depends on the ability of producing calves. The annual calf crop provides herd replacements through selection of the best calves.



A calf being fed with colostrum

Calving site

- Should be clean and far from objects The place should be free from predators (protected)
- It should be a warm place

Signs prior to calving

Period	Signs
2 or 3 weeks prior to calving	<ul style="list-style-type: none"> • Udder will begin to swell with milk
1 week before calving	<ul style="list-style-type: none"> • Swelling around the belly in front of the udder
Just before calving	<ul style="list-style-type: none"> • Active tail swishing from one side to the other • Water bag of amniotic fluids • Enlargement of the vulva • Loosening of the side of the tail head • Calf's hooves and nose emerge • One to two hours the calf should follow

Management of dystocia

Most communally-managed in-calf heifers and cows experience difficulty on calving and therefore need to be tightly monitored prior to calving. Dystocia may result when the calf is too big for the dam, which may result from the use of very big bulls on smaller cows. It may also

result from wrong positioning of the calf in the uterus. The use of calving ropes may help when it is not too complicated. If the situation is complicated, a veterinarian has to be consulted.



A cow experiencing dystocia

Care of the newborn calf

Always handle the calf carefully, as they are vulnerable to disease.

- Mucus should be removed from the nose and mouth of the calf
- Insert a straw into the calf nose in an attempt to make it sneeze and start breathing
- Let the cow lick the calf dry
- Facilitate suckling of calf within first 2-3 hours
- Make sure the calf suckles eight or more times before the end of the first four days
- The navel should be dressed with tincture of iodine or any good disinfectant to prevent local infection and to help the umbilicus heal quickly
- The afterbirth should have come away by 24 hours after birth and if not, gently pull it out

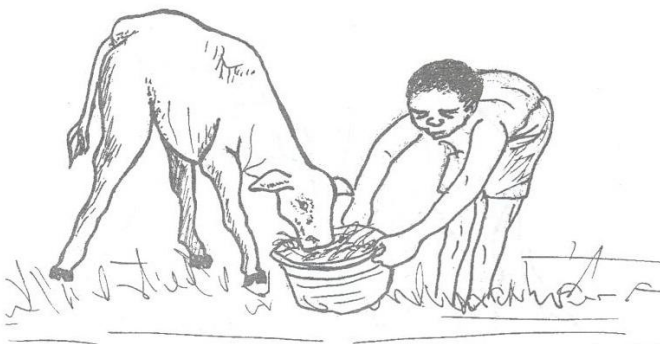
Importance of colostrum

Feeding of the colostrum to the calf within 3 hours is emphasised because of high nutritive value and better absorption. Absorption of protective antibodies from colostrum is much reduced after 12 hours. Colostrum contains antibodies to protect against diseases, and its laxative properties stimulate the removal of the calf's first faeces.

The feeding of the calf should aim at achieving 1.5 kg/day. A guideline on feeding should be:

- 10% of the body weight of water each day
- 3% of body weight of solid feed
- 14.16% protein in feed given
- 8-10 MJ /kg dry matter

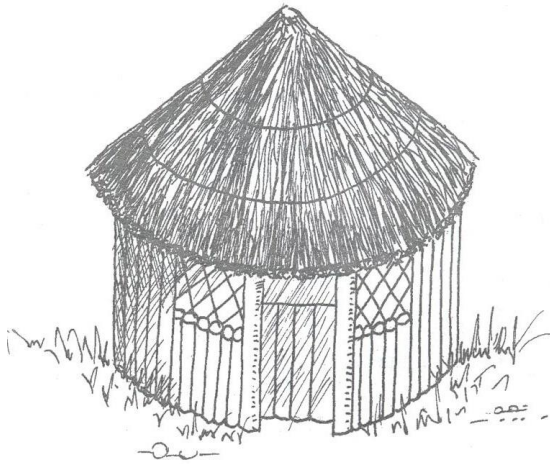
Calves should eat 2kg meal per day by the seventh week of age.



Newly born calf being fed

Calf housing

The objective of housing calves is to reduce stress from exposure to cold, heat and wet conditions which predispose the calf to infection and reduce growth rates.



A well designed calf pen

Good calf house should have the following characteristics:

- Easy to clean and disinfect
- Should be dry
- Should protect the calves against extreme temperature conditions
- Should provide light and space
- Good ventilation
- Should provide protection against diseases e.g. pneumonia

Dosing programme for calves

Communal farmers recommend the following dosing programme:

Parasite	Site	Remedy	Period
Tapeworm	Small intestine	Systemex Valbazen	6 wks–9 mths
Roundworm	Abomasums	Systemex Valbazen	2 wks after rains in Nov, Jan-Feb, April- May
Liver Fluke	Liver and bile duct	Rafazole Ranide Systemex+	Nov, Jan, Feb, April, May

Weaning of calves

The appropriate time to wean calves from their dams is when they are at 6 months of age. At this stage calves will have been acclimatised to the fibrous feeds both in natural grazing and supplementary feeds. Weaning would allow the dams to improve on their body condition in the post partum period since all nutrients will be channeled for maintenance. There are three basic methods of weaning: complete separation, exchange of calf to cow herds and the use of weaner plates. The three methods of weaning are explained below:

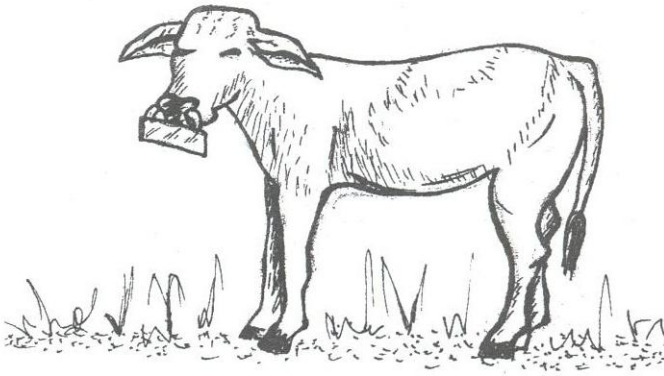
- Complete separation
This method involves the removal of calves from their dams completely. It applies in systems where calves can be kept in their own paddocks and separated from their dams at once. However, this method may induce stress on calves since the maternal care will have been lost. This may even result in disease outbreaks if not properly monitored.

- Exchange of calf to cow herds

This involves the removal of calves from their respective dams and introduced into a different herd of dry cows or heifers. This is done to reduce the effect of stress on calves.

- The use of weaner plates

A weaner plate is used in such a way that it prevents the calf from suckling whilst still with the dam; there is no separation of the dam and the calf. This method is ideal for communal farmers since there is no need for extra paddocks for the separated calves and dams. It also reduces stress on calves and the weaner plates can be made from locally available material.



A calf with a weaner plate

Summary

We have observed in this session that the proper selection of bulls and heifers helps communal farmers to make informed decisions for the proper management of a beef cattle production enterprise - no matter how small-scale it might be. Also, proper calf rearing reduces diseases incidence, mortality and improves the quality of meat, milk yield, draught power, economic returns and food security.

Chapter Four - Nutrition in beef cattle

Introduction

Animals need food to grow and maintain their body activities. The natural grassland provides the most of the feed which cattle use. In sweet veld areas, cattle would be expected to gain weight at least during the early part of the dry season.

Duration:
1 hr

Objective:
By the end of this session, the participants will be familiar with:

- All the essential nutrients and their importance
- Fodder production for beef cattle
- Urea treatment of stover
- Classification of feeds into roughage, concentrates and succulents

Materials:
Hay, crop residues, guar bean seed, beef concentrates, urea, water, flip chart and stands, magic markers

Method:
Group discussion, brain storming

Feed intake

The amount of feed consumed daily by beef cattle varies according to their age, live mass, condition and the type of feed available. In general, cattle will consume feeds containing about 90% dry matter in daily amounts equal to between 2.5 and 3% of their live mass. The amounts usually decrease with increasing age and condition until, for example, an old cow or bull in heavy condition may consume feeds equal to about 1.5% of its live mass. At the same time, a mature cow on dry grazing may consume feeds equal to about 1.5% of live mass, whereas the same animal would consume a readily available and easily digested concentrate mixture in amounts equal to more than 3% of its live mass.

Essential nutrients

The following nutrients are needed by the animal for maintenance, growth and production.

Energy

From substances such as carbohydrates, fats and oils. They are energy producing nutrients expressed by terms such as total digestible nutrients (TDN) or metabolisable energy (ME).

Proteins

Provides amino acids. They are nitrogen containing nutrients expressed as crude protein (CP), digestible crude protein (DCP), or digestible protein.

Minerals

These are specified as elements such as calcium, phosphorous, copper and iodine. They are grouped into major minerals and trace elements.

Water

Needed in many biochemical reactions and facilitate feed intake.

Vitamins

Fat-soluble and water soluble vitamins. Fat-soluble vitamins include vitamin A, D, E, K. Water-soluble vitamins includes the vitamin B-Complex.

Characteristics of animal feeds

Feed for livestock are classified into three broad groups: roughage, concentrates and succulents.

Roughages

These provide energy which can be used for movement and producing heat. They are also used in building up reserves. They are a cheap form of basal diet in beef cattle. Carbohydrates are low in moisture, fibrous and low digestibility. Energy is required in large amounts by the animal for physical activity, maintaining body temperature, growth, reproduction and lactation.

Cereal grains such as maize, sorghum, millet and some of their milling by-products provide the richest sources of highly digestible starches and sugars. The bulk of the energy consumed by most cattle comes from grazing and natural forages, which have energy content of 45-55% total digestible nutrients (TDN).

Concentrates

These feeds are low in fibre and rich in digestible nutrients. Concentrates usually have low moisture content (about 10%) and over 70% total digestible nutrients. Calcium levels are usually relatively low (0.05 to 0.2%) and phosphorous levels relatively high (0.4 to 1.2%). Concentrates are sub-divided according to the most important nutrients they contribute in compounded rations, e.g. protein concentrates such as the oil seed cakes (30 to 50 % CP) and energy concentrates such as the cereal grains (80% or more TDN). Concentrates are expensive feeds for ruminants since they have to be purchased. Because of this, they are only fed as supplements to achieve high production.

Succulents

They include all feeds with high moisture content (10 to 30% dry matter). Most succulent feeds are highly palatable to stock and can be consumed in relatively large quantities by ruminants (up to three times as much as dry feeds by mass). Examples of succulent feeds include green grass, silage, pumpkins and melons.

Fodder establishment

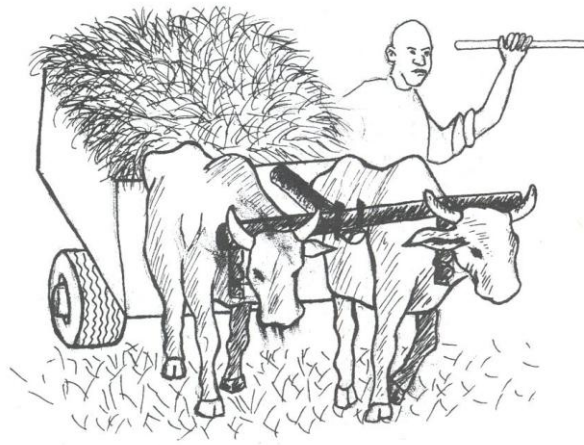
How to make hay

Hay is fodder, which has been dried and stored without further processing. When dried, hay can be stored indoors and fed to cattle in the dry season when feed is scarce. Dried feeds such as hay are an important part of the diet for young and old livestock alike.



Making hay

Grass to be made into hay should be cut prior to the flowering stage to obtain the highest feed value. After cutting, it should be dried if possible in the sun, being turned so as to evenly dry it. A day or two for the finer grasses and more for the high growing grasses. After drying, hay should be stored, preferably indoors where it will not become damp or contaminated.



Hay on a scotchcart

How to treat stover or straw with urea

Maize, millet and sorghum stover, have low nutritional value if fed as they are, but can be improved in quality and digestibility by treating them with a three-week fermentation period using a urea-water solution.

Urea is potentially poisonous hence it is important that the following steps are followed:

- Prepare a trench and line it with plastic or banana leaves on the sides of the floor. If you intend to use continuously, make two trenches and alternate filling them at 3-week intervals.

The treatment is more successful if the stover is chopped to aid infiltration of the urea-water solution and improve packing in the trench, the straw needs to be cut smaller. Prepare, all at once, enough stover/ straw for a 3-week period.

- Mix 1 kilogramme urea 46% with 10 liters of water per 16-20 kilograms of straw or stover and then sprinkle the solution.
- Fill the trench with moistened stover/straw and cover it immediately with plastic or banana leaves and then apply soil on the plastic to keep out the air and reduce evaporation into the air of both the water and nitrogen from the urea.



Mixing hay with urea

After 3 weeks it is ready to open from one end. You will be repulsed by the strong granules smell (urine), and otherwise it will appear slightly moister and browner than the dry stover. Take the amount you would want to feed and let it sit out until the next day before feeding it. You can slowly reduce the time required between taking it out and feeding it as the cow gets used to the odour. Surprisingly, the cows like it and will consume more treated stover than they will regularly untreated straw in that it has more effect on fattening cattle than on increasing milk but certainly it is very beneficial to the maintenance of cattle through dry months.

Caution: This mixture should not be fed to calves, and other immature ruminants or non-ruminants.

Growing fodder crops in low rainfall areas

Due to declining rainfall amounts being received, our grazing areas do not provide adequate (in quality and quantity) feed throughout the year to support livestock production.

The following fodder crops can be grown:

Cereals/grasses

- Sorghum both forages and grain type
- Millet both forages and grain type
- Rapoko
- Bana grass
- Star grass
- Kikuyu grass

Legumes

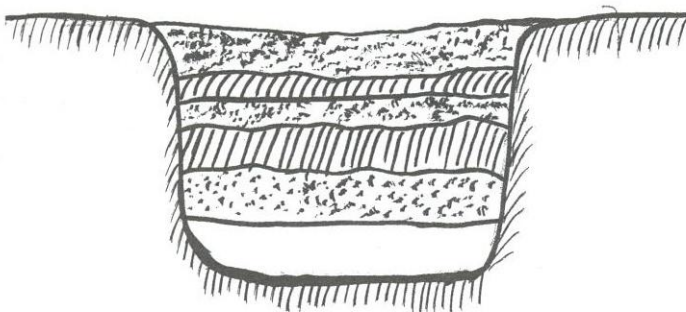
- Guar beans
- Cow peas
- Dicholis bean or lablab
- Velvet bean
- Pigeon peas

Forage tree legumes

- Leucaena leucocephala
- Pigeon pea

Land preparation

- There is need for full seed bed preparation
- They are adapted to a wide range of soil
- Good drainage is necessary for good growth
- Pennisetums and sorghum do best in deep fertile soils be they sandy or clay.
- Sorghum and legumes should be planted when you receive effective rains
- Planting is done annually except for pennisetums, which are perennial crops and they are only replanted when gaps are noticed



There is need for proper seed bed preparation

How to plant

- Sorghum is planted from seed whilst pennisetums are planted from rooted tillers or stem cuttings.
- Pennisetums are planted in furrows or holes dug along rows.
- If rooted tillers are used, all roots plus one node should be in the hole and one node outside, whereas two nodes must be in the hole and one outside if the stem cuttings are used.

- After planting, always cover with soil and press with your feet around the plant to ensure good root soil contact.
- Rooted tillers or stem cuttings should be placed into the dug holes at an angle of 45 degrees.

Spacing

- It is recommended to plant sorghum rows at the usual spacing of 90cm
- If you are inter-cropping, plant the legume midway between two sorghum rows leaving 45cm either side if your row spacing is 90cm
- With pennisetums, the rows should be 1m apart under irrigated or at 1.5m apart under dry land conditions
- Within the row allow 1m apart
- When inter-cropping the legumes, as in sorghum, plant them midway between the pennisetum rows

Fertilizer application

- If fertilizer is used then 300kg/ha (6*50kg bags) of compound D can be banded on one side of the marked sorghum rows or furrows of pennisetums.
- Where no fertilizer is available, well decomposed cattle or goat manure can be used at 4000kg/ha
- Top dressing for sorghum will be done as for maize whilst for pennisetums, top dressing is done when the grasses are well established and after every harvesting. This is usually done using 100-150 kg (2-3 bags) of AN.
- In addition, you need to apply Potassium chloride commonly known as Murate of Potash at 60-100 kg/ha if you are cutting and carrying

Mineral supplementation in beef cattle

Natural grazing for cattle is deficient in phosphorous hence the need to supplement phosphorous in cattle diets. The complete diet should contain 6g of calcium and 3.2g of phosphorous per kilogram. Normally, this is supplied in diets through the inclusion of limestone flour, at a rate of 5g/kg. Salt is normally added to most diets at the rate of 5g/kg. Vitamin A may be provided in rations.

Management and development to minimize feed requirements

- Destock early to leave as much grazing as possible for the remainder
- Make the best use of the available veld
- Use areas with failing early

Exercise

1. List the different classes of the essential nutrients and give examples.
2. Describe the various stages of urea treatment.
3. What are the three broad groups of animal feeds, give examples for each?

Summary

Nutrition forms one of the corner stones of any successful beef production enterprise. It is therefore, important for farmers to be fully aware of the nutritional requirements of their stock, including the different classes of animal feeds. Proper application of the concepts covered in this chapter leads to a healthier stock and increased income for the farmer.

Chapter Five - Animal Health Management

Introduction

Good animal health management is important to improve beef production. As a result, there is need to control and prevent the spread of diseases. Tickborne diseases, for example, pose a major challenge to beef production and management to smallholder farmers, particularly those in the communal areas - through lack of adequate tick control.

Objective:

By the end of this session, the participants will be familiar with:

- Internal and external parasite control measures
- Identifying a diseased animal and be able to come up with the recommended treatment for the specific disease
- A vaccination programme for prevention of certain common diseases

Materials:

Flip chart, magic markers, pictures of common diseases

Method:

Group discussions, facilitator notes, brainstorming

Duration:

2 hrs

1. Internal Parasite Control

The main signs of worm infestation in cattle are diarrhoea, emaciation, rough coat, swollen abdomen and bottle jaw (swelling under the jaws). Worms cause heavy economic losses hence the need to control them. There are three main methods of controlling internal parasites in cattle, namely:

a) Dosing

Cattle should be dosed at stipulated intervals using a broad-spectrum dewormer. It is best to use a different type of worm remedy than the one used last time each time cattle are dewormed. The most important group of animals to be dewormed are young animals, animals being kept for fattening and pregnant animals. A strategic dosing programme has been in use in the past whereby cattle are dosed twice a year – that is at the beginning of the dry season (when cattle are being fed on maize stover soon after harvesting) and at the onset of the first rains.



Beef cattle need proper health management

However, cattle can be dosed when they are showing signs of worm infestation. Also, all new brought in animals should be dewormed before they are introduced to the rest of the herd.

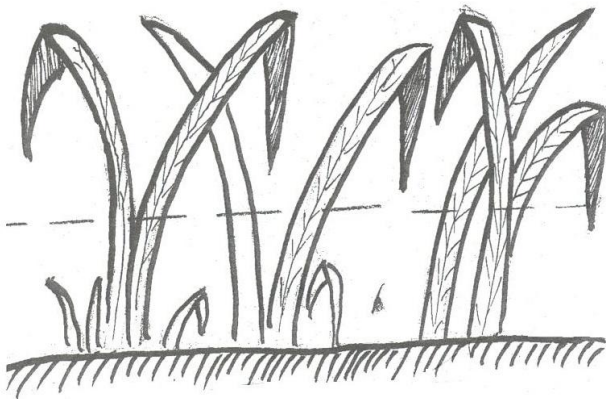
b) Feeding animals properly

Healthy, well-fed animals can fight off infections and can develop a good immunity against worms.

c) Good pasture management to reduce build up of parasites

Good pasture management involves the following:

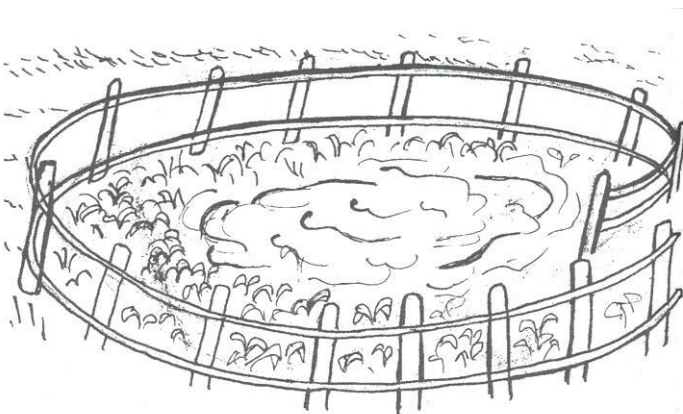
- Avoid over-stocking as it causes the pasture to have large numbers of worm larvae on it if the animals grazing on it are suffering from worm infestations. When other animals graze on the same pasture they easily get infected.
- Practice rotational grazing as it allows the pasture to rest and most of the worm larvae die before they infect other cattle.
- Grazing different kinds of animals together on the same pasture. Worms are known to be species specific. For example, donkeys cannot be infected by worms that infect cattle. So when donkeys graze on the same pasture with cattle, the donkeys eat worm eggs and larvae that infect cattle without them becoming sick. In other words, the donkeys cleanse the pasture of worm eggs and larvae that could have otherwise have infected cattle. The opposite is also true.
- Graze different age groups of animals on different pastures. Young animals are more likely to get infection from older animals and are affected more severely than older animals.



Pasture management reduces parasites. Cut along grass so that sunlight will kill many worm eggs in faeces on the ground

For liver flukes

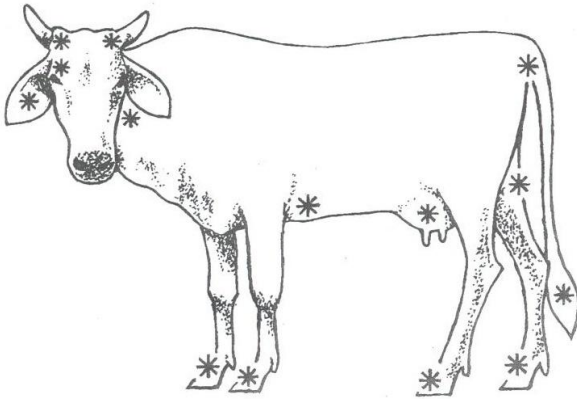
- Fence off swampy areas to keep cattle away
- Use water from boreholes, wells or from fast moving rivers
- Some farmers keep ducks. These ducks eat snails which are the intermediate host of the immature liver flukes.



Put up fencing to stop animals eating liver flukes

2. Tick control

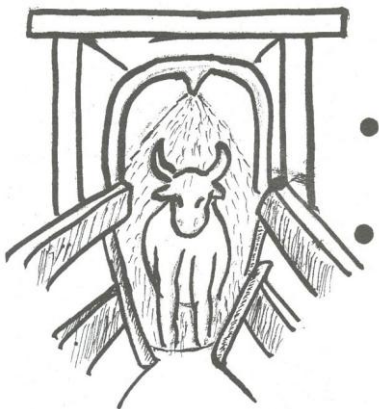
Ticks cause the following problems to animals: they are transmitters of tick borne diseases, loss of blood, irritation and also animals become prone to other bacterial, fungal and other parasite infections. Hence the need to control them.



This illustration shows the parts of the body where ticks most often live

There are four main methods of tick control, which are:

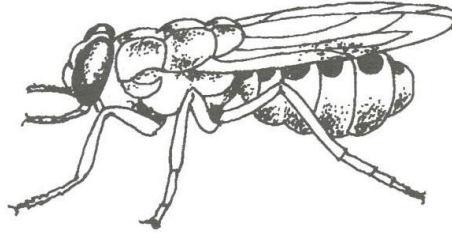
- **Plunge dipping**
It is the most commonly used dipping method where by an animal leaps into a dip tank resulting in total immersion of the said animal. It then swims through to exit ensuring thorough soaking of the body.
- **Spray Race**
Animals are forced to walk though a passage in which jets of spray wash are sprayed over the entire body of the animal resulting in wetting of the body. It can be as effective as plunge dipping.
- **Hand spraying**
Used in small herds where there are no other alternative dipping facilities. A nap sack is used. For this method to be effective, the animal has to be thoroughly wetted.
- **Pour-on**
The dip chemical is applied from the poll of the head along the top line of the animal and up to the base of the tail. The chemical then spreads to cover the entire body. Pour-on acaricides are expensive and are mainly used in areas where water is scarce.



A cow in a spray dip

3. Tsetse fly control

Tsetse flies are transmitters of trypanosomosis. In addition, animals are irritated by the painful bites of the flies and they also cause blood loss. The most commonly methods of tsetse fly control are the following:



Tsetse fly

- Traps – attract and catch flies for surveillance.
- Targets – attract and kill flies. At least four traps or targets are incorporated per every square km.
- Dipping - Acaricides with pyrethroids as the active control tsetse flies.

Other ways of controlling the flies but are not as effective as the ones above are:

- Bush clearing
- Spraying the ground
- Sterile male release technique

4. Vaccinations

A vaccine is a preparation containing an infectious agent in a form, which does not cause disease, and when given to an animal it will produce resistance to that specific disease. When exposed to that infectious agent, the animal will not suffer from that disease.

Farmers routinely vaccinate against the following common diseases:

Lumpy Skin Disease

Cattle are vaccinated between August and October and the vaccination is repeated annually.

Brucellosis (Contagious Abortion)

Animals between 3 and 8 months are vaccinated once only. Bulls and pregnant animals should not be vaccinated. Also, avoid using antibiotics at the same time when vaccinations are made.

Anthrax

Cattle are vaccinated annually in endemic areas.

Tick Borne Diseases

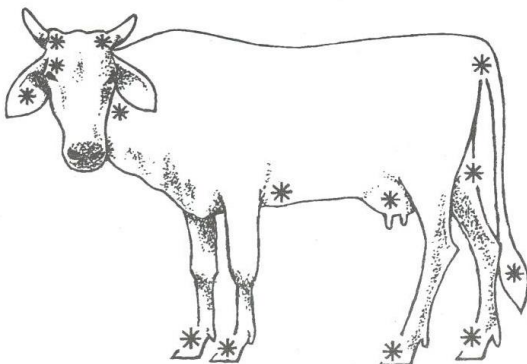
Animals are vaccinated in winter and the vaccine protects for the entire life of the animal.

Trypanosomosis

Cattle are vaccinated annually using Samorin.

5. Common diseases

a. Tick borne diseases



Gall Sickness (Anaplasmosis)

Occurrence

It is common in summer. Old animals are highly susceptible to infection.

Clinical Signs

- Fever
- Loss of appetite, weakness and incoordination
- Pale mucous membranes and jaundice
- Increased frequency of urination and the urine is normally golden yellow or amber coloured
- Constipation, and at times the dung is covered with mucous

Postmortem

- Jaundice (yellow discolouration of mucous membranes and of whole carcass)
- Watery blood
- Spleen and liver are enlarged. The liver is friable and yellow orange in colour
- Gall bladder is distended with thick bile, hence the common name of the disease
- Rectum contents are dry and faeces are covered with mucous

Diagnosis

- History
- Clinical signs
- Postmortem findings
- Identification of parasite on peripheral smears

Treatment

Oxytetracyclines

Imidocarb dipropionate (irnizol)

Control

- Dipping
- Vaccinations

Red Water (Bovine Babesiosis)

Occurrence

It is common in summer and older animals are more prone to get the infection than young animals. The causative agent, which is a protozoan, is transmitted by blue ticks.

Clinical Signs

- fever
- loss of appetite, dullness and staring coat
- laboured breathing
- pale or yellow mucous membranes
- red urine
- nervous signs

Postmortem

- Pale to yellow carcass and mucous membranes
- Red urine in the bladder
- Enlarged spleen

Diagnosis

- Clinical signs
- Postmortem
- Parasite identification on peripheral smears, spleen smears or brain crush smears

Treatment

- Diminazine aceturate (Veri ben or Berenil)
- Imizol

Control

- Dipping
- Vaccinations

January Disease (Theileriosis)

Occurrence

The disease is common in summer between the months of December and March with most cases being observed in January hence the name of the disease. The disease is transmitted by brown ear ticks. Young cattle are more prone to get the infection than older animals. Deaths are higher in exotic breeds than in indigenous breeds.

Clinical signs

- The disease is usually fatal fever
- Swelling of lymph nodes
- Loss of appetite
- Lacrimation and cloudiness of the eyes
- Listlessness
- Terminally there is laboured breathing and froth exuding from the nose and the animal collapses and dies.

Postmortem

- Generalized swelling of the lymph nodes
- Froth in windpipe and fluid in the lungs
- Cloudy eyes
- Abomasal wall is swollen and haemorrhagic ulcers may be seen

Diagnosis

- History
- Clinical signs and postmortem findings
- Parasite identification on lymph node and spleen smears

Treatment

- Butalex
- Clexon

Control

- Dipping
- Vaccination

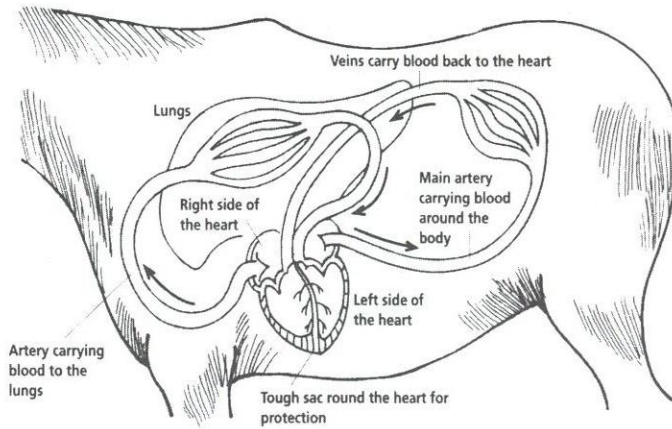
Heartwater

Occurrence

It is common during the rainy season. The disease is transmitted by bont ticks. Young stock can resist the disease. Exotic breeds are highly susceptible.

Clinical signs

- Fever
- Loss of appetite, depression and laboured breathing
- Nervous signs: exaggerated blinking of eyelids, twitching of the eyes, walking in circles and a high stepping gait, convulsions lying on one side with limbs making running movements followed by coma and death
- The disease can also cause sudden death



When an animal is suffering from heartwater, the sac may have much fluid in it.

Postmortem

- Fluid in heart sac, chest and occasionally in abdominal cavity
- Oedematous lungs and froth in the trachea
- Enlarged spleen
- Haemorrhage on surface of lung and in trachea.

Diagnosis

- History
- Clinical signs
- Parasite identification on brain crush smears

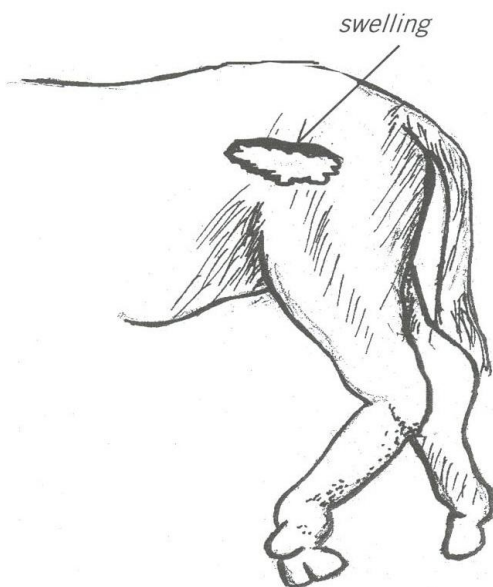
Treatment

It is effective during the early stages of the disease. When the animal is recumbent the drug can be given intravenously to have a reasonable chance of success. The drug of choice is oxytetracycline.

Control

- Dipping

Blackleg (Quarter Evil)



Occurrence

It can occur at any time of the year but most cases are seen in spring and summer. Young stock between the ages of 6 months and 3 years are most affected. Animals in good body condition are most affected. Mortality rate with blackleg approaches 100%.

Clinical Signs

Onset is rapid with the animal showing the following symptoms:

- Lameness, depression and fever.
- Limb muscles are swollen and painful. Gas formation under the skin can be felt over the affected muscles and is referred to as crepitations
- The animal becomes recumbent and usually dies
- The disease can also cause sudden death.

Postmortem

It is not advisable to open up a carcass suspected to have died of the disease. Bloating and putrefaction occur quickly. Affected muscles are dark red discoloured and spongy with an excess of thin blood-stained fluid containing gas bubbles. All body cavities contain excess fluid. The spleen is swollen and firm. Haemorrhagic patches are present on most internal organs surfaces.

Diagnosis

- Clinical signs and postmortem findings
- Bacterial agent can be identified on blood smears and other organ smears

Treatment

It is rarely successful, but high doses of antibiotics can be tried during the initial stages of the disease.

Control

- Annual vaccination of animals at risk
- Carcasses of animals should not be opened up but should be destroyed by burning or deep burial to avoid soil contamination.

Anthrax (Tungundu, Chigwadara)

Anthrax is a zoonosis - that is it can spread between animals and man. Man get the infection via the skin, inhalation or through ingestion of contaminated meat. It is caused by a bacterial agent that can form spores.

Occurrence

Outbreaks tend to occur in either marked climatic or ecological change such as heavy rainfall, flooding or drought.

Clinical Signs

- Sudden death
- The peracute form is characterized by: staggering, dyspnoea, trembling, collapse, convulsive moments and death
- The acute form is characterized by: fever, excitement followed by depression, stupor, respiratory distress, convulsion and death.
- Due to fever rumination ceases, milk production reduces and pregnant animals may abort
- Chronic infections are characterized by oedematous swellings under the skin that can be extensive involving the ventral neck, thorax or the shoulders

Treatment

Due to shortness of illness it is difficult to treat the condition, however the disease can be treated by penicillins.

Control

- Vaccination

- Deep burial or burning of carcasses

Trypanosomosis (Chirwere Chemhesvi)

The disease is transmitted by tsetse flies. It is a chronic condition.

Clinical Signs

- Weak and easily get tired
- Rough and dull coats
- Emaciation
- Swollen lymph nodes
- Watery discharge from the eyes
- Pale mucous membrane
- Fever that comes and goes
- Abortion of pregnant animals or give birth to weak offspring
- Animals do not eat properly

Diagnosis

- History
- Clinical signs
- Identification of parasite on peripheral blood smears

Treatment

Diminazine aceturate (Veriben or Berenil)

Control

- Vector control
- Vaccination

Bovine Ephemeral Fever (Three Day Stiff Sickness)

It is viral disease that is transmitted by biting insects mainly the sandfly. The disease is most common during the summer.

Clinical Signs

- Fever, anorexia, cessation of rumination, rapid breathing and a sharp drop in milk production
- Shivering, rough hair coat, stiffness and lameness.
- Animal stands with an arched back head down otherwise it lies down and declines to stand up and presents a parturient paresis posture Some cattle have diarrhoea others are constipated
- Watery discharge from the eyes and nose
- Animal shakes its head constantly
- Loss of condition
- On the third day fever subsides animal starts to eat, ruminates and is on its way to complete recovery although lameness may linger on.

Diagnosis

- History
- Clinical signs

Treatment

- Anti-inflammatory drugs are used, for example aspirin, tomanol, and novalgin

Control

- Vaccination

Brucellosis/Contagious Abortion (Chirwere Chekusvodza)

Contagious abortion (CA) is an infectious disease of cattle that affects the reproductive organs. CA is caused by a bacterium. Discharges from animals that have aborted contaminate drinking water, pastures and bedding which on ingestion by health animals results in infection.

Occurrence

The disease is not seasonal and can occur at any time of the year. It is common in intensively reared cattle particularly dairy cattle. Farmers and veterinary personnel attending to infected cattle or people drinking untreated milk can get the infection.

Clinical Signs

Cattle that are not pregnant do not show signs at all. Pregnant animals exhibit the following signs:

- They abort in late pregnancy
- Stillbirths at full term
- Cattle can give birth to weak calves
- Retained afterbirth
- Increased incidence of metritis (inflammation of the uterus) and prolonged calving to conception intervals.
- Swollen testicles in bulls is a sign of infection. In other animals the infection can present as a localized swelling of the knee or hock.

Diagnosis

Diagnosis is based on history (abortion storms) and clinical signs. The bacteria can also be isolated from aborted calves, vaginal discharges and milk. Antibodies against the disease can be demonstrated in blood collected from the dam.

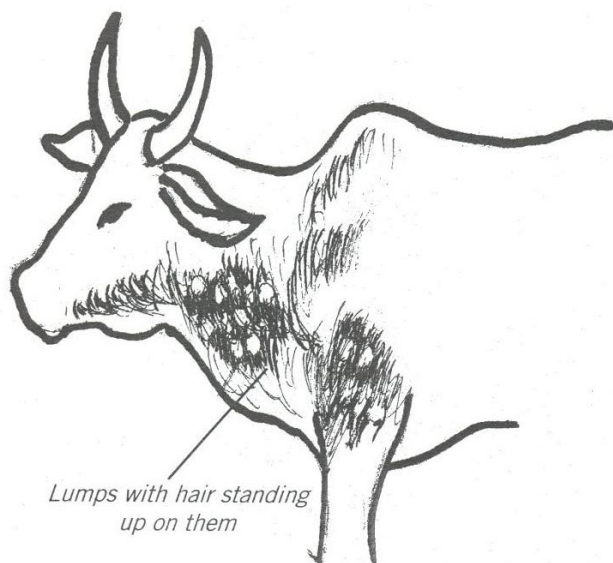
Treatment

The disease cannot be treated.

Control

Control is based on culling all infected animals and vaccination of all female cattle between the ages of 3 and 8 months old. The vaccination is done once and offers life-long protection.

Lumpy skin disease (Chirwere Chemapundu)



The disease is caused by a pox virus. It is a serious disease and may result in heavy losses. The disease is mainly spread by biting flies, although contact transmission is known to occur but is very rare.

Clinical Signs

During the first stages of the disease cattle develop a fever, do not feed, may salivate and have eye and nasal discharges. Later during the course of the disease nodules/lumps appear on the skin. In severe cases the nodules can appear on the nose, in the mouth, on the udder and vulva of cows and on the scrotum and sheath of bulls. Fluid swellings appear down the legs and under the chest and belly. In most cases, the lumps disappear or the skin covering the lumps dies and sloughs off leaving wounds or the lumps become hardened. Mastitis is common and cows and bulls may be temporarily or permanently sterile. Pneumonic cases may appear.

Postmortem

Ulcers are found in the mouth, nasal cavity and trachea. Pneumonia may be present.

Diagnosis

Presence of painful lumps/swellings on the skin strongly suggests a diagnosis of lumpy skin disease.

Treatment

There is no specific treatment of the disease. Antibiotics are used to treat secondary bacterial infections and wounds are treated using anti-screwworm remedy.

Control

The disease is controlled effectively using vaccines against the disease. Vaccinations must be done in October and November before the rains start. Vaccinations should be done annually. In the face of an outbreak, a sterile needle should be used for each individual animal to avoid spread of the infection.

Papillomatosis/Warts (Mhopo)

It is a viral disease that affects the skin and is transmitted by direct contact and by biting insects. The disease is more common in young cattle.

Clinical Signs

It is characterized by growth of non-itchy dry, horny, multiple cauliflower-like growths which are more than one centimetre in diameter. Animals experience pain when the warts are pulled or secondarily infected. A venereal form can also occur that predisposes the animals to mating problems and dystocia.

Treatment/Control/Prevention

The disease is self-limiting - that is, spontaneous recovery can occur. The warts can also be surgically removed. An autogenous vaccine can also be used to control the disease.

Bloat/Ruminal Tympany (Chirwere Chekufufutirwa)

Bloat is an overdistention of the rumen and reticulum with the gases of fermentation, either in the form of a persistent foam mixed with the ruminal contents-called primary or frothy bloat, or in the form of free gas separated from the ingesta-called secondary or free-gas bloat. The susceptibility of individual cattle to bloat varies and is genetically determined.

Occurrence

Frothy bloat occurs when animals consume a lot of wet pasture especially with legumes in it or feeds that ferment easily that they are not used to.

Whereas free gas bloat occurs when the oesophagus is blocked or when the cattle have a condition that causes paralysis, for example tetanus.

Clinical Signs

The following signs are observed:

- Enlarged abdomen especially on the left side
- The affected cattle have difficulty in breathing which can be accompanied by mouth breathing, tongue protruding out, extension of the head and frequent urination.
- The animal does not eat
- Some vomit and develop a mild diarrhoea
- Some have a greenish froth coming out of their nostrils
- If bloat worsens animal collapses and dies

Post-mortem

Postmortem findings are characteristic. Bleedings in the lymph nodes of the head and neck, heart, and upper respiratory tract are marked. The lungs are compressed and bleedings may be present. The first part of the gullet is congested and bleedings are present, but the thoracic portion of the gullet is pale-the demarcation known as the "bloat line" of the gullet. The rumen is distended, but the contents usually are much less frothy than before death. The liver is pale due to expulsion of blood from the organ.

Treatment

Frothy bloat is treated using anti-foaming agents, for example vegetable oil/ mineral oil at a dose 250-500ml or commercially prepared agents, for example Bloatguard", Skilled personnel can do a rumenotomy, which is an operation to remove the contents in the rumen.

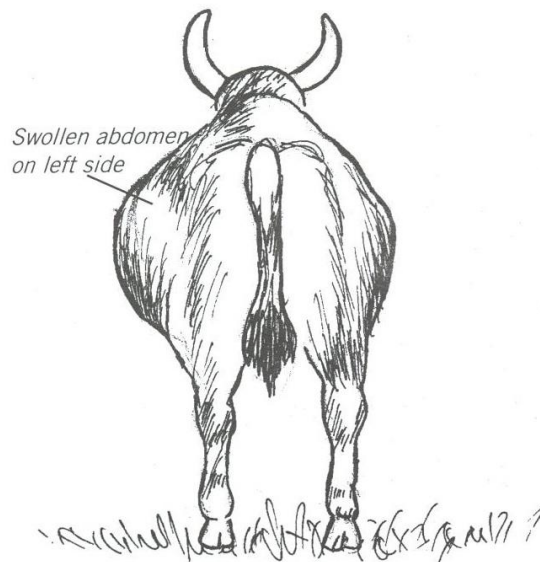
Free gas bloat is relieved by passing a stomach tube or through the use of a trochar and cannula.

Prevention

Bloat can be prevented by feeding cattle hay/dry grass before they are turned out onto pastures that cause bloat. Also animals can be given antifoaming agents before they go onto pastures at a dosage of 60-120ml/head/day.

Dermatophytosis/Ringworm (Zvisasa)

Ringworm is an infection of skin, nails and hairs caused by fungi. Humans can get infection from sick animals if they get into contact with them. The infection is more common in young and very old cattle and longhaired breeds of cattle. Ringworm as a herd health problem is more common in winter.



Clinical Signs

Scaling patches of hair loss with gray-white crust formation, but some become thickly crusted with pus. In calves, non-itchy lesions around the eyes are characteristic, though generalized skin disease may develop. Cows and heifers develop lesions on the chest and limbs most often, whilst bulls develop on the dewlap and intermaxillary skin.

Diagnosis

Diagnosis is based on characteristic lesion where a circular area of hair loss is surrounded by a raised area of inflammation on the skin. It is also diagnosed by direct microscopic examination of hair and scabs and fungal culture.

Treatment

The disease is self-limiting, spontaneous recovery can occur, but several topical treatments are available. Topical agents in use include washes or sprays of 4% lime sulfur, 0.5% sodium hypochlorite (1: 10 household bleach), 0.5% chlorhexidine, 1 % povidone-iodine, natamycin, and enilconazole. Individual lesions can be treated using antifungal creams like clotrimazole or miconazole. It is best to clip hairs around the lesions before applying the antifungal creams.

Prevention and control

Sick animals should be isolated and treated. Contaminated places and instruments must be disinfected before use on healthy animals. Also, hairs and scabs from infected animals should be burned.

Bovine Coccidiosis (Manyoka Aneropa)

Coccidiosis is a protozoal infection of young cattle between the ages of 1 month to 1 year. Outbreaks are more common in the wet season especially where cattle are crowded.

Clinical Signs

- With subclinical or chronic disease cattle appear thin, the back region is stained with faeces and feed efficiency is reduced.
- With clinical disease cattle develop watery diarrhoea that may contain blood. Severe infections are associated with bloody diarrhoea or watery diarrhoea that contains streaks of blood, shreds intestinal lining or mucous.
- Fever, loss of appetite, dehydration, depression and weight loss are also associated with the disease.
- Death can also occur.

Diagnosis

It is based on clinical signs, history and identification of the parasite on faecal smears.

Treatment

The drugs of choice are:

- amprolium at a dose of 10 rug/kg/day for 5 days
- sulfonamides for example sulfaquinoxaline at a dose of 3 rug/kg/day for 3-5 days

Prevention and Control

- Isolate sick animals from healthy ones and treat them as soon as possible
- Avoid over-crowding and keep animals on clean dry bedding
- Avoid contamination of water and feed troughs by placing them high to keep faeces from getting into them.
- Adult cattle should be kept from young cattle.

Sweating sickness

It is an acute tick borne toxicosis characterised by a profuse moist eczema and reddening of the skin and visible mucous membranes. Young cattle are more susceptible but older cattle can also be affected.

Clinical Signs

- The first signs to be noticed are: fever, listlessness, watering of eyes and nose, reddening of visible mucous membranes, salivation and necrosis of oral mucosa and extreme pain.
- The eyelids stick together.
- The skin feels hot and a moist inflammation of the skin develops, that starts at the base of the ears, the groin and the perineum and later extends to cover the entire body.
- The hairs become matted and beads of moisture can be seen on it.
- The skin emits a sour odour.
- Later the hairs and upper most layer of the skin can be easily pulled off exposing red raw wounds.
- Tips of ears and tail can slough off.
- Eventually the skin becomes hard and cracked making it prone to secondary bacterial infection.

Prevention and Treatment

Tick control is the only effective preventative measure. Antibiotics are used to control secondary bacterial infection. Anti-inflammatory drugs are also indicated to control inflammation.

Traditional Veterinary Methods

- Activated charcoal (chin'ai) – used in cases of poisoning
- Indigenous fruit (damba) – the sap can be used to treat eye infections
- Muvengahonye/Muremberembe/Murunjurunju – wound treatment
- Aloe (gavakava) – used to treat coccidial infections
- Mubvamaropa – used to treat eye cataracts
- Powdered snail shells (Hozhwa) – used to treat cataracts
- Kusunga mhopo
- Mutyora – used to treat bloat
- Bloat also treated by cooking oil, opaque beer, vinegar

Summary

It is crucial for cattle producers to be able to easily identify common diseases that afflict their herds. The issue of maintaining healthy animals presents another important challenge in beef cattle production. This chapter has covered diseases that affect beef cattle leading to losses if not managed effectively. The focus is on ensuring that the producer is able to identify the disease, know the treatment options available and prevent future occurrence.

Chapter Six - Identification and Record Keeping

Introduction

There is need for any beef cattle farmer to have an identification system to be able to keep production records. Ideally, the system or method of marking animals for identifying or recording must be permanent, easily applied and clear enough to read from a reasonable distance.

Objectives:

By the end of this session participants should be able to:

- Articulate the different methods of identifying beef cattle
- Appreciate the importance of information and records management in beef cattle production and management

Tools:

Pictures of branded/notched animals, flip charts, markers

Method:

Group discussion, facilitatory notes

Provincial veterinary identification

To meet veterinary animal health regulations, all cattle over the age of six months must carry a provincial brand on the left neck or shoulder. Pedigree cattle that can be identified individually are exempted from these regulations.

Ownership identification

Cattle need to be marked for ready ownership identification and prevention of stock theft and recovery of stolen and stray animals. Marking is usually done with hot iron brand and comprises a set of numbers, letters or symbols registered at the Registrar General's Office. Each individual cattle owner has to have this brand. Ownership brands provide an important source of protection to the legal cattle owner.

Methods of marking animals

Many different methods and combinations are used to identify animals since no ideal method has yet been found.

Branding

This involves the cauterization of the skin to kill the hair follicles and so leave a visible scar or mark on the skin of the animal. This can be done using hot iron branding, chemical branding and freeze branding. Over cauterization restricts blood supply to the enclosed area and results in wounds that heal very slowly.

Hot iron branding

Hot iron branding requires skillful use. Good hot brands are recommended and can be read from a fair distance although they may be less satisfactory if the animal's coat is woolly. The dimensions of the branding irons are specified in the respective branding regulations, which give a good guide for management brands.

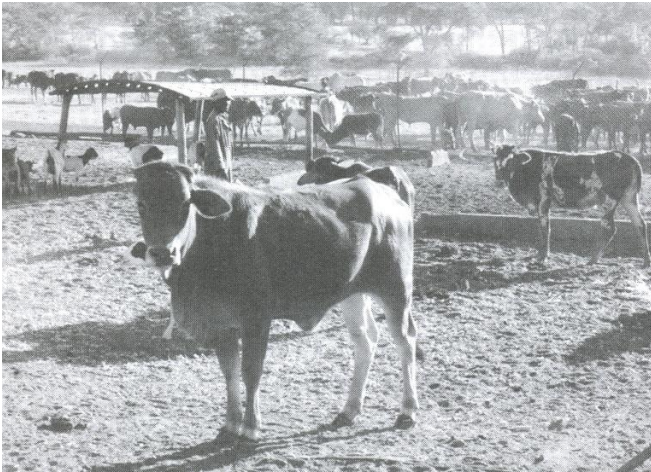


Cattle need to be branded for ownership identification

The branding iron should be heated using fire, gas or electricity to a glow and if not sure, test the iron on a wooden plank. Once the animal is properly restrained, the iron is firmly placed in the appropriate place. The length of time that the brand is held in the position will vary according to its heat and the pressure applied. A good permanent brand is brown in colour.

Ear Notching

Ear notching has served long as an effective form of cattle animal identification. This involves punching the ears using different shapes and different positions to represent different numbers using an ear puncher. The problem with this method is that the numbers are limited and they are difficult to read from a distance. In addition, the ears may get torn and that distorts the numbers.



Unbranded cattle are difficult to identify

Ear Tags

These come in many different designs but they prove not to meet the twin requirements of permanency and legibility at a distance. Ear tags can therefore not be used as a permanent form of identification but are useful aids to management. The following types are in common use:

- Self-locking metal tags
These are reliable and easily applied by the special applicator. Allow space in the tag for the ear to grow if the animal is still young.
- Plastic tags
Many types are available on the market. An appropriate tag should be used to suit the farm circumstance.
- Tattooing
Tattoos are made using a specially spiked applicator and ink to apply the tattoo to body parts such as the ears and occasionally the lips of the animals. Although it provides a permanent record, a tattoo is awkward to read and if not done skillfully, can be difficult to read. Tattooed animals cannot be identified without first catching them.

Record keeping

Record keeping is of utmost importance for good management. Records must therefore be kept up to date. It is important to keep records on your farm so that you know what is happening, can compare it to what should be happening, and can identify problem areas or animals.

All cows should be individually identified with a name or number written on an ear tag. This is especially important if you have more than one cow.

The easiest type of record to keep is the farm diary where you write down all the events that happen on a specific day or that you have planned to do. All calvings, heats, services, pregnancy diagnosis (PDs), drying off dates, illness, treatments and vaccinations should be written in the farm diary.

You can keep individual cards for each cow on which you write everything that happens to that cow in her lifetime. This is very useful if you are investigating infertility or decreased production with your veterinary or extension officer. You can also keep separate records for different events that happen on the farm such as a calving book, a service book, and an illness and treatment book.

DATE	COWS	BULLS		HEIFERS	OXEN	STEERS	CALVES		TOTAL
		ADULT	YOUNG				MALE	FEMALE	

technical guide

Chapter Seven - Marketing of beef and beef products in Mbire District

Introduction

Livestock and livestock products play a significant role in the economy of Zimbabwe. Cattle are the main livestock and contribute approximately 35-38% of the Gross Domestic Product (GDP) generated from agriculture in Zimbabwe (MLA, 1999). Foreign currency is also received through exports of beef and hides and skins of different livestock species. The export revenue mainly comes from the large-scale commercial farming sector.

Sales of livestock and livestock products are an important source of farm income and make a valuable contribution to foreign currency earnings for the country. The value of the livestock sector, excluding wildlife, is estimated at US\$2.57 billion and export earnings have the potential to exceed US\$130 million (LADAC, 2005). The livestock sector is ranked third in the agricultural sector of Zimbabwe, after tobacco and cotton.

Given the right market incentives, subsistence cattle production will move to a more commercial orientation, with better management of crop-livestock systems resulting in higher production and off-take rates in marginalised communities like Mbire District.

Learning Objectives:

By the end of the session participants should appreciate:

- Market chains available in their district
- Roles played by various actors and business development services in the market chain
- Existing opportunities for commercialisation of beef cattle production in Mbire District.

Method:

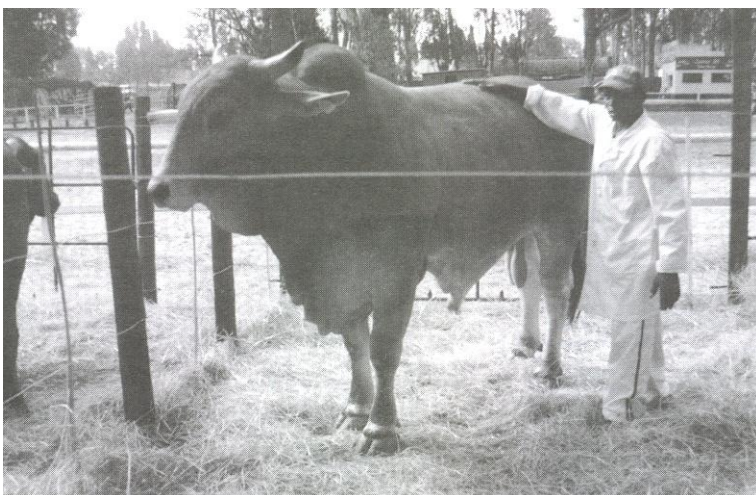
Group discussions

Tools:

Flip charts and markers

Time:

45 minutes



Given the right market incentives, subsistence cattle production will become commercial

1. Marketing

This is a social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others.

Marketing aims to service three distinct groups of need, which are:

- Basic physical needs, eg food, shelter
- Social needs
- Individual needs

Supply and demand

Supply is the quantity of products that producers can offer for sale whilst demand is the quantity of products that consumers can buy.

The market operates using the above laws of supply and demand.

Beef Cattle Market chains in Mbire District

Below are the market chains most farmers in the district use when selling their beef cattle.

1. Producers - Consumers
2. Producers - Abattoir - Retailers - Consumers
3. Producers - Middlemen - Informal market - Consumers
4. Producers - Middlemen - Abattoir - Retailers - Consumers

Chain 1 and 3 are informal and are used by most farmers. Chain 1 is usually conducted at local level where producers sell beef cattle to each other, other local residents, for example civil servants working at clinics, schools etc, and passers by. Chain 4 is the most common marketing practice used by farmers capturing approximately 80% of beef cattle marketed in the lower Zambezi Valley. Chain 3 and 4 are driven by the desire of middlemen to generate incomes. Making money the business of middlemen, and in doing so they exploit farmers when they are most vulnerable, for example at the beginning of the summer season when they need money to buy inputs. Chain 2 is formal and producers take their cattle to abattoirs and are paid according to weight and carcass grading after slaughter. This is the most viable chain but most difficult as most farmers lack access to transport therefore becoming vulnerable to middlemen.

Factors affecting beef cattle marketing in Mbire

- Poor access to market.
- Prohibitive transport costs.
- Low production and offtake (less than 10%).
- Lack of public infrastructure and services for cattle marketing.
- Poor quality meat due to poor management.
- Lack of a clear market channel and information on standards/grades, price and demand.
- The beef cattle marketing pattern is seasonal and follow the availability of seasonal income after crop sales.
- Lack of a formal institutional network governing trade in livestock and livestock products but sanitary regulations concerning production and movement.

Value Chain

This specifically refers to the addition of value as the product progresses from primary producers to final consumer. Improving market chain performance is the goal of many enterprises and value chain concepts are at the heart of sound agro enterprises processes.

The Value Chain Analysis is a tool for working out how to create the greatest possible value for customers. The more value created on any commodity, the more goods are bought at a relatively high price. The value chain of livestock and livestock products includes producers, traders,

processors, wholesalers, retailers and consumers. In addition, there are public, non-governmental and private service providers.

Actors and Business Development Services in the marketing value chain

The identification of the main actors in the livestock sector is based on the value chain analysis. Performance or efficacy of a market chain is a result of how well the actors in the market chain are organised and how well the chain is supported by a range of Business Development Services (BDS). Market chain performance can often be increased by improving or gaining access to BDS rather than assisting an individual or group of actors in a market chain.

Actors

Producers

At least 90% of cattle in Zimbabwe are held by smallholders in communal areas, followed by the resettlement and the commercial areas. The communal sector also has the largest numbers of other livestock, that is, goats, sheep, pigs, donkeys and poultry.

Traders

There are many formal and informal traders who buy livestock from farmers either at auctions or go around the farms buying small numbers of cattle. Such traders have to spend a lot of time traveling to sometimes buy one or two animals. As a result, the transaction costs are very high. Some of these traders indulge in speculative activities and unfair trade practices in that they would collude to buy livestock at very low prices. Usually, this is caused by lack of information on market conditions among the producers.

Processors

There are several processors in the livestock sector and these vary according to the livestock type. In the beef industry, there are 53 abattoirs/processors who are involved in the slaughtering of the animals, grading the carcasses, processing different parts of the animal such as horns, hooves, skins and hides. There are many other smaller processors since the market is now liberalized. However, most processing plants are located near urban rather than producing areas.

Wholesalers

There are several wholesalers who are involved in the selling of livestock products. Some of these wholesalers are involved in the slaughtering of animals. Some of the supermarket chains and butcheries have also been involved in both slaughtering and distribution of livestock products, especially beef. However, the slaughters are done by abattoirs on behalf of the supermarkets. They then do their own packaging and distribution of the product.

Retailers

Most butcheries fall under this category. Just like the wholesalers, this group is also involved in the slaughtering and distribution of livestock products.

The Consumers

These are at the end of the value chain. Consumers buy their livestock products from wholesalers, the retailers and from the producers themselves, depending on the product desired. Most of the beef consumers are very sensitive to price and when they buy is dictated by price rather than quality considerations. In the case of beef this would be commercial beef, otherwise known as ration meat in the trade. This constitutes at least 75% of the market for beef in Zimbabwe.

Public Sector Service Providers

Public sector service providers fall under government ministries and these are various departments that are involved in the livestock sector. These are the Department of Livestock Production, the Department of Veterinary and Technical Services, the Department of Agricultural Research and Extension (AREX), Livestock Development Trust and Faculties of Agriculture at universities.

They provide health, nutrition and marketing services in the livestock sector. They are involved in research, policy formulation and coming up with strategies to boost livestock production and marketing.

NGO and Private Sector Service Providers

This group comprises of Non-Governmental Organisations (NGOs), private companies and other parastatals. They provide services to the farmers through projects that help improve the livelihoods of farmers in the livestock sector. An example includes the Heifer International Projects that involved passing on the first heifer that would have been calved to the next person in need.

Private processors work together with governments departments in providing services.

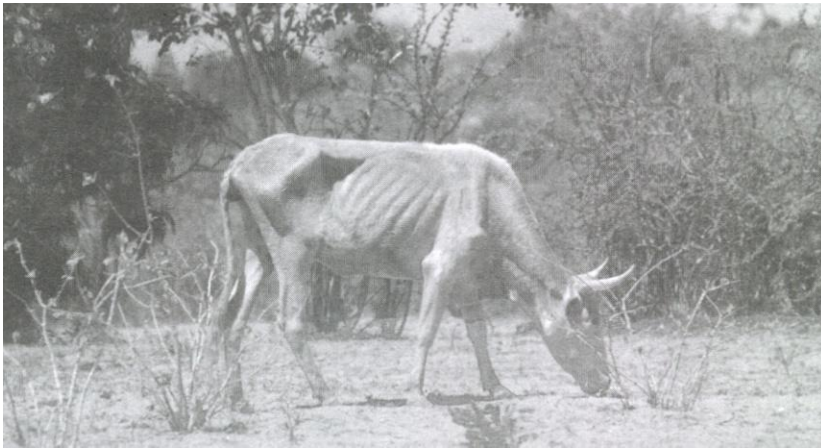
2. Business development services

- i) Supply of inputs
Access to good quality and affordable inputs in the right form and volume is critical to the activities of different actors in a market chain.
- ii) Research
Essential for development of appropriate technologies that enhance production, processing and marketing. These technologies lower production costs, increase supply and quality. It is these technologies that make the difference between subsistence and commercial production.
- iii) Transport
Farmers should find the most cost effective means of transporting their products and constantly review this service to find the most cost-efficient means.
- iii) Communication
This includes post, telephone, e-mail and internet, etc. This is important as a means of information transfer and dissemination.
- iv) Market information
Essential for decision making, reducing transaction costs and risks and facilitating flow of goods from production to consumption. This decreases cheating and unfair pricing. Farmers should have knowledge on input sources and prices, current product prices in local markets, degree of market volatility, price trends and seasonality, number and types of markets operating in different localities; their volume, quality requirements and selling arrangements.
- v) Finance
Access to loans is important for commercial beef cattle production, management and marketing.

Opportunities for commercialisation of beef cattle production in Mbire

- Setting up of market information systems
- Promotion of market fairs or sale pens by providing an improved service to all players involved in the value chain
- Promotion of the use of village-based animal health workers in beef cattle marketing
- Promotion of farmer field schools in place of group extension model
- Improved reproduction of through improved nutrition by using improved forages and targeted supplementary feeding in order to improve quality and value of beef in Mbire District
- Promotion of commercialization by smallholder livestock producers through training in entrepreneurship skills
- Mobilisation of farmers to form viable commodity associations or interest groups to strengthen dialogue among players in marketing chain
- Provision of training in leadership and management to farmer group leaders

- Support to informal livestock traders and transporters to form and run an association which interacts with the farmers' commodity association
- Credit schemes to allow smallholder farmers access inputs for commercial livestock production, management and marketing
- Trade finance assistance for informal livestock traders.



Unhealthy cattle (such as the one above) fetch low market prices.

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technical guide

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This manual is a first edition: feedback would be welcome and is positively encouraged. Please send any comments on it to:

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Suggestions for improvements will be included in subsequent editions.

About Practical Action Southern Africa

Practical Action (formerly ITDG), is an international technology development organisation with its head offices in the United Kingdom. The organisation was founded in 1965 and has offices in Southern Africa, East Africa, Sudan, Latin America, Bangladesh, Nepal and South Asia. Practical Action Southern Africa office, based in Harare, covers work in Zimbabwe, Zambia, Mozambique and Malawi.

We work in partnership with communities and other development institutions and in all our work, we respect diversity and show great concern for future generations. Specifically, we work with communities helping them choose and use appropriate technologies to 'improve their lives today and generations to come. Our vision is that of a world free of poverty and injustice in which technology is used to the benefit of all. We hope to achieve this by helping to eradicate poverty' in developing countries through the development and use of technology and by demonstrating results, sharing knowledge and influencing others.

Development consultancy

The Development Consultancy Unit is the consulting arm of the organisation whose mandate is to spread the knowledge the organisation has amassed over the years, as well as raise additional funding wherever possible for our projects.

It is also the aim of the organisation that in assisting other organisations meet their obligations; we also acquire new knowledge, which we then use for the betterment of those we serve. Our consultancy services are limited to the areas we have expertise in.

Practical Action's core principles

People first

Our work with technology is people centred. It concentrates on what matters most to the people with whom we work, respects their rights, and supports their own efforts to improve the quality of their lives.

Working in partnership

People living in poverty are partners in their own development. Practical Action can help them to get access to information, knowledge and options to identify their priorities and choose the way to deal with them.

A concern for future generations

Practical Action projects aim to be sustainable economically, environmentally, socially and institutionally.

Respect for diversity

Practical Action policies and practices respect basic human rights of all people regardless of their differences in terms of gender, ethnicity, religion or physical ability.