

LIVESTOCK MANAGEMENT AND REARING PRACTICES

ESTABLISHING A FARM ANIMAL ENTERPRISE

FACTORS TO CONSIDER WHEN SELECTING AN ANIMAL TO REAR

Activity

What features/characteristic should farmers look out for when selecting animals to rear?

Dairy cattle

- Longevity or lifespan should be long enough to avoid constant replacement
- Fertility and conception rate should be high
- Diseases resistant
- Feed conversion ratio should be high
- Should have a good milk yield
- Butter fat content of the milk should be high
- Should have a good temperament
- Strong hind legs and feet to hold the weight of the animal and udder altogether
- Well developed and attached udder
- The beef merit of the animal after the milking

Beef cattle

- Fertility rate I.e the number of animals born per year should be high
- Killing out or dressing percentage should be high
- Meat quality should be good
- Feed conversion efficiency should be high
- Muscling or marbling ability
- High birth weight
- High growth rate
- Resistance to diseases
- Tolerance to drought

Poultry

Layers

- High number of eggs laid per hen
- High egg weight i.e relatively big eggs

- Good egg quality
- Rapid feathering to reduce amount of feeds spent on maintaining body temperature
- Feed conversion ratio should be high
- Age at point of first lay

Broilers

- Large body weight
- Good dressing percentage
- Good feed conversion efficiency
- High growth weight
- Rapid feathering
- High disease resistance
- Good breast development

Pigs

- Litter size should be big
- Litter weight at weaning ,the higher the better
- Slaughter weight
- Carcas weight, length and weight
- Fat cover
- Feed conversion efficiency
- Disease resistant
- Body conformation , i.e many teats and long body

Factors to consider before establishing a beef herd

- Availability of water, for drinking by the animals and spraying
- Availability of pasture, which must be adequate and nutritious
- Availability of extension services, these should be available to ensure that animal healthy is properly maintained
- Availability of market,
- Prevalence of parasites and diseases, a beef herd should not be established in an area if parasites and diseases are prevalent
- Government policy should be favorable to farmers
- Availability of complements and supplements to feeds
- Availability of good quality breeds

- Availability of land, beef animals require large tracts of land since they are often reared extensively
- Availability of capital to establish farm structures and buy necessary equipment
- Size of the herd, one must have a large size of herd to have good profits
- Fertility of the animals, should be high to replace the numbers of animals that are removed/ slaughtered
- Adaptability of the animals to the local environment
- Resistance of the animals to parasites and disease
- Physical condition of the animals i.e should not be lame or sick
- Age of the animals i.e should not be too old

Factors to consider before establishing a dairy herd

1. **Capital**
This is needed in the construction of farm structures, purchase of land and the animals.
2. **Land**
There should be enough land to accommodate farm buildings and paddocks where animals can graze from
3. **Labour**
Both skilled and unskilled Labour is required for performing specialized work and manual Labour respectively.
4. **Reliable source of water:** Water is needed by the animals for drinking and also in other farm operations like cleaning and mixing of drugs.
5. There should be a ready market for milk and milk products which is easily accessible to reduce the costs incurred in looking for market.
6. **Pastures:** The place in consideration should have good pastures since the production of the animals is greatly affected by the quality of what they eat.
7. There must be reliable transport so that the farmer can easily move farm products to the market and bring back inputs.

8. The breed selected should fit the market demand and the Climatical conditions of the place in consideration.
9. Security is a very important factor for any business since insecurity results into loss of property and life
10. Government policy in place should be encouraging dairy farming through the provision of good breeds of cattle
11. Climate in the area should be good for dairy farming

LIVESTOCK MANAGEMENT PRACTICES

These are practices carried out in raising and managing farm animals. Some are done on a daily basis, some are weekly and some are done after a specific period of time. Examples include, feeding, watering, cleaning animal houses, spraying, dehorning, insemination, disease control, castration, deworming, grooming, housing, identification etc

1. CASTRATION.

This is the removal of both testicles/testes of animals which are not meant for breeding purposes.

Importance of castrating farm animals.

- Animals become docile and more suitable for work
- It helps to control breeding
- It makes the meat more tender and improves its quality
- It facilitates faster growth rate and live weight gain
- Management becomes easier since males and females may not be separated
- It can be used as a means of animal improvement since inferior calves are castrated
- It is a means of controlling animal diseases associated with mating
- It eliminates a bad smell that is common in male animals

Methods of castration

Surgical method

- Restrain the animal to be castrated

- Clean the hands, equipment and the scrotum with a disinfectant to avoid infections
- Make an incision/slit through the scrotum to expose the testicles
- Cut the spermatic cords to remove the testicles using sterilized blade or knife
- Seal off blood vessels to stop bleeding using a hot iron/knife
- Repeat the procedure for the other scrotum
- Apply a healing cream or antibiotic powder to avoid fly and maggot infestation
- Monitor the animal to avoid excessive bleeding and maggot infestation

Advantages of surgical method

- Its cheap as materials like razors are used
- Its quick i.e it takes few minutes for a skilled person to accomplish the task
- Sure, the farmer is always sure that the testes are removed and the failure rate is zero
- It requires very little training

Disadvantages of surgical method of castration

- Infections may rise since a wound is created
- The procedure needs anaesthetics to reduce pain

The rubber ring/elastrator method

Procedure

- An elastrator is used to stretch a rubber ring
- The scrotum and the testes are passed through the ring
- The ring is released at the neck of the scrotum
- Blood circulation to the testes stops, they shrink and fall off.

Advantage of closed operation

- No risk of infection since the wound is not created

Disadvantages of closed operation

- Failure rate is high

The burdizzo method

- Restrain the animal and cast it down
- Apply a pain killer/an anaesthesia

- Maneuver the spermatic cord towards the scrotum
- Place the blunt jaw of the burdizzo around the neck of the scrotum
- Crush the spermatic cords of each of the testis

2. IDENTIFICATION

This is the marking of an animal

Reasons for identifying farm animals

- to prevent ownership disputes
- stray animals can be found
- essential for proper farm record keeping
- to identify individual farm animals for particular purposes

Methods used when identifying farm animals

- **Branding**, involves putting number letters, designs or a combination of these onto the skin of the animal, types of branding include the following
 - **Hot iron branding.** The branding iron with a required design is heated until it is red hot. It is then placed on the hide of the animal on the position where the mark is required. It leaves a mark when it heals.
 - **Chemical branding.** The area to be branded is clipped, the iron is dipped into the branding chemical and extra liquid/ chemical is drained to avoid smearing. The wet iron is applied to the clipped part leaving a mark.
 - **Freeze branding.** The branding iron is dipped in liquid nitrogen or alcohol with dry ice added. It is then applied on the hide where the mark is required leaving a visible mark.
- **Ear tagging.** Tags of light metal or plastics with numbers stumped on them are fixed on the ears of animals. The tags are either self-piercing or a hole is made in the ear before they are fixed
- **Ear notching.** This is the cutting of v-shaped notches at specific places on the ear by means of scissors. Each notch represents a particular number.
- **Tattoos.** An outline of the desired number/letter is made by piercing on the inside of the ear. A tattooing ink or pigment is incorporated in the outline
 - **Non-permanent marks**
 - Branding on the horns with small hot irons
 - Neck chains with numbers

- Labels stick with adhesive compounds
- Clip marks cut in the hair or rump or ribs with curved scissors
- marks made by paint or colored markers on the skin of the animal

3. DEHORNING

This is the removal of horns from the head of the animal. It can also be known as disbudding.

Advantages

- The risk of animals causing bodily harm to the stock man and other animals is reduced.
- It increases availability of space in kraals, milking parlors, and vehicles when they are being transported
- Injuries caused by horns reduce the quality of hides
- Animals are easier to handle and reduces damages on farm structures
- To some farmers, polled animals are more appealing than horned ones.

Methods used when dehorning farm animals

1. The chemical method.

This is suitable for young calves of 3-10 days of age. Chemicals used are caustic potash (KOH) and caustic soda (NaOH).

Procedure

- Clear the hair/fur from the horn buttons
- Surround the area with a ring of heavy grease to protect the skin and eyes of the animal from the chemical
- The caustic stick is moistened and rubbed over the button until the skin begins to slip and blood appears. The paste is applied to the bottom with a flat stick
- Calves are protected from rain for a few days following treatment

2. The hot iron method

A red hot iron is placed on the outside of the horn bud for a short time. Care should be taken not to burn too deep inside the head. The method is used at the age of 7-30 days.

3. The elastrator method

It is used in cattle when the horns are 5-15 cm long. The rubber ring is placed well down into the hairline around the horn. Small horns drop off in 3-6 weeks while larger ones can take up to 2 months.

4. The saw method

Hard brittle horns are removed with a wire saw and a dehorning saw. The advantage of using a wire saw is that it heats up on cutting. This seals off blood vessels which stops bleeding.

DEWORMING.

This practice involves administering of oral drugs that kill internal parasites, these include: Tape worms, liver flukes, round worms etc. chemicals used are collectively known as dewormers. A drenching gun is used to administer such drugs

N.B:

- Deworming can also be done intramuscularly by injecting a dewormers into the muscle of the animal.

RESTRAINING OF ANIMALS.

This is the hindering of animal movement using physical force. Restraint is used to perform operations such as dehorning, vaccination, inspection, treatment, and branding. The amount of restraint depends on the operation to be performed, the temperature and the size of animals.

Methods used

➤ Halters

These are used for leading animals especially cattle. They are usually made of leather consisting of a head piece and a nose piece. The two pieces should be adjustable.

➤ Casting animals

This is the throwing the animal to the ground. It is usually carried out if the animal is to be controlled for a long period of time during operations such as inspection, branding, treating, slaughtering, trimming hooves, castration and dehorning. Casting tackle may be used.

➤ **Use of ropes**

- Tethering animals
- Casting animals
- Setting up farm structures
- Restraining animals during operations such as milking
- Marking lines in the field during planting
- Raising materials during construction

VACCINATION.

Is the practice of inducing and building up an animal's immunity against specific infectious diseases by giving the animal a vaccine.

A vaccine is a weakened or changed agent e.g. bacteria or virus that is unable to cause a serious diseases on the animals.

DRENCHING.

This is the giving animals oral treatment where the animal is forced to drink the medicine e.g. dewormers or vegetable oils to treat bloat.

CULLING.

This is the picking and removal of animals from the herd because the animals.

Reasons for culling

- Too old, ready for sale, un productive, slow growing, infertile, diseased, with bad habits eg poor diary temperament

GROOMING.

This involves brushing of the hair coat and cleaning of the animal. It

- Makes the animal clean and good looking
- Massages and stimulates blood and lymph transmission
- Removes loose hairs , lice, and other skin parasites
- Ensures clean milk in milking animals
- Prevents injury of the penis of the bull during mating by removing hairs that can hold clusters of dry manure.

DOCKING

This is the cutting short of tails in animals. It has been done in cattle, sheep, dogs, pigs.

Reasons for docking

- Hygiene and disease prevention, in sheep, it prevents accumulation of dung around the tail which reduces the risk of flystrike. (a condition where flies lay eggs in dirty wool leading to maggot infestations).
- Reduces tail injuries, in confined animals like pigs, tail biting can occur due to boredom or stress. Docking greatly reduces this risk.

SHEARING.

It involves cutting off wool from farm animals. It's mostly done in sheep.

HOUSING.

Animals need to be protected from adverse weather conditions like rain, sunshine, this therefore calls for construction of animal house. The different animal houses include:

- Sty – Pigs
- Kennel – Dog
- Cattle – Kraal
- Rabbit – Hutch

FEATURES OF A GOOD ANIMAL HOUSE

- It must be strong enough in the walls to protect the animal from wild animals and thieves
- Sited in dry and well drained site to reduce pest and disease incidences
- It has a hard impervious floor that slopes to one end to enable drainage of liquid manure
- The walls are strong and high enough to keep the animal in
- Has a wind proof wall from one side from which the wind usually blows
- Has a strong roof to keep out the rain and the sun
- Has a large space between the tops of the wall and the roof for good ventilation
- Has a water trough and feed trough to hold water and feeds for farm animals.
- Sited near an adjacent dung heap down slope and downwind of the animal house to ease disposal of manure
- Has the ability to make economical use of local construction materials available
- The floor should be rough finished to avoid slipping by the animal

- Calf pens have no draughts and should be warm

FEEDING AND WATERING

Animals need water and feeds daily.

Food is any substance consumed to provide nutrients

A nutrient is a compound or element essential to support life

Purpose of feeding animals

- For repair and maintenance of the body physiological processes.
- For growth and repair of worn of tissues
- For production in terms of milk, eggs, and skins
- To build resistance to diseases
- For energy production
- For reproduction. Oogenesis and spermatogenesis require nutrients to make the ova and semen respectively.

Components of food

These include proteins, lipids, carbohydrates, roughages, vitamins and mineral salts

Types of feeds

a) Roughages / coarse fodder

These feeds are mainly of plant origin, they are coarse and have a high fibre content, they are usually low in protein and energy content e.g green fodders, hay, and straws

Advantages of roughages

- They aid peristalsis
- They provide bulk to satisfy appetite
- They prevent constipation
- They hold water which helps in keeping faecal matter moist for easy passage through the gut

b) Succulents

These are feeds of a high moisture content , low dry matter content and a high digestibility e.g young grass, silage, cabbages, and root crops

c) Concentrates

These are feeds that contain a large amount of nutrients per kilogramme. There are energy concentrates or protein concentrates, energy concentrates are cereals or milling by products eg maize bran, protein concentrates include fish meal and seed cake of legumes eg cotton, sun flower, soya and ground nuts

d) Supplements

Is a feed or feed mixture given to improve the nutrient value of the ration / diet

e) Additives

These are substances that contain no nutrients but are added to food to increase utilization, growth and at times to fight stress. They include, Hormones, Antibiotics and other drugs, flavourings(improve taste of the feed) Tranquilizers(help to fight stress) Anti oxidants are added to feeds to prevent auto oxidation

f) Basal or energy feeds

These are rich in starches or sugars and are concentrated sources of energy

Principles of livestock feeding

- **Palatability**

It's the tendency of a feed to be liked by the animal

- **Productivity**

Animals must be given enough food to maintain its condition as well as yielding well eg milk

- **Profitability**

Productivity must be profitable to the farmer

Common terms used in livestock nutrition

- A ration Is the amount of food fed to the animal in a day
- Maintenance ration Is the amount of food required by the animal to keep it alive without losing or gaining weight
- Production ration, Is the food required by the animal in addition to the maintenance ration to supply nutrients needed for production
- Starch equivalent, Is the amount of pure starch that can give the same amount of energy as 100kg of that feed. Eg if a feed is quoted as SE30 eg barley it means that 100kg of barley yield the same amount of energy as 71kg of pure starch
- Total digestible nutrient, Is the total of digestible protein, nitrogen free extract, and ether extract available in a feed
- Digestible crude protein, is the total of the utilizable protein and non protein nitrogen available in the feed

Mixing feed rations

In formulating feed rations the following factors are considered

a) Animal factors

- Age of the animal, young animals require higher amounts of proteins than finishers
- Health of the animal, diseased animals require higher amounts of vitamins than normal animals
- Physiological state of the animal, Pregnant animals may require more energy intake than empty animals
- Productivity of the animal, Heavy milkers may require more minerals than low milkers
- Type of the animal, Ruminants are able to handle large amounts of roughages than non – ruminants

b) Feed factors

- Nutrient composition of the feed, the final mixture should have equal proportions of energy and protein nutrients
- Palatability of the feed materials, materials should be mixed such that the final mixture is palatable to the animal
- Wholesomeness of the mixture, feed should not be toxic to the animal
- Availability of feeds, final mixture should satisfy the animals nutritive requirement
- Cost of the feed stuffs, mixtures that are cheapest and yet meet the animals nutrient requirements should be chosen

Factors affecting the utilization of rations by the animal

- Age of the animal, actively growing animals have a higher utilization efficiency than finishers
- Type of the animal, ruminants are more efficient in utilization of coarse fodder than non- ruminants
- Health of the animal, Healthy animals have a higher feed conversion ratio than sick animals
- Climate, animals that are in a less stressful environment will have a high feed conversion ratio than their counterparts

- Digestibility, feeds with a high digestibility can be utilized more than those with a low digestibility
- Nutrient content, feeds that are wholesome give higher feed conversion rates than unbalanced feeds
- Amount of feed given to the animal per day, If the animals are given more feeds than they require, the utilization efficiency will be low than those which are given just enough feeds
- Additives in the feed, some feeds have antibiotics and hormones that increase utilization
- Processing the feed has undergone, processing may increase digestion hence efficient utilization also removes toxins eg trypsin inhibitor in soya beans, gossypol found in cotton, mimosine found in *Luecaena leucocephala*
- Physiological state of the animal, pregnant animals and milkers may be efficient utilizers of minerals and vitamins than empty animals

Methods of feed mixing

Rations are made by mixing different ingredients together, proportion of the desired proteins is the criterion in feed mixing because they are the most expensive feeds and cannot be substituted like fats can substitute carbohydrates for energy

Pearson square

Is a method used to determine the proportion of feed ingredients to mix and make a ration

How to use a pearson square

- Draw a rectangle or square
- The desired protein content is put in the centre of the square/ rectangle and the protein percentage of each ingredient put written at the left hand corners
- Subtract diagonally across the square without regards to signs
- The figures obtained at the right hand corners give the parts / ratios of the ingredients to be mixed
- The parts of the ingredients are then converted into percentages to give the respective percentages of the ingredients in the ration

Examples

A farmer wants to produce a 20% protein ration using maize bran which is 8% proteins and fish meal which is 40% protein . In what proportion would he mix the maize and fish meal

ANIMAL HEALTH

A state of good health exists when the body processes function normally allowing the animal to perform to the best of its genetic potential

Disease

It is an illness due to specific agent

A disease may also be defined as any deviation from normal physiological functioning of the body

Parasitism

Is a symbiotic relationship between organisms where one organism benefits (parasite) while the other doesnot benefit and is harmed (host)

Terms used in animal health

Sterlization This is the destruction of all micro-organisms on an object

An antiseptic, is the substance used to eliminate infectious organisms from living tissues

Disinfectants, Are substances used to eliminate infectious organs from the surface of equipments etc

Signs of good health in cattle

- It should move freely
- It should respond readily to touch
- The skin should be clean, smooth, shiny and movable
- Animals should feed well and greedily
- The nose should be cool and moist
- The body temp should be 38.6
- Urine should be clear and straw coloured
- Yield should be consistent
- Dung should soft, neither excessively hard nor watery without blood stains
- It should have normal pulse rate
- When standing the animal should not shift one foot from another
- Responds quickly to stimulus
- The tails should not be repeatedly switched except for flies

- The animal shows alertness and watches what goes around with a bright eyeHorns and feet should neither be too hot or too cold
 - Ruminants should ruminate regularly
- NB Symptoms of disease are the reverse of the above points

Classification of diseases

- Infectious diseases, These are due to specific pathogens eg viruses, bacteria, protozoa, fungi etc
- Non infectious diseases, These are diseases that are not caused by any living agent eg due to physical injury
- Contagious diseases, These are diseases which are transmitted from one animal to another eg by direct or indirect contact eg foot and mouth disease, tuberculosis, brucellosis
- Non-contagious diseases, These cannot spread from one animal to another by direct or indirect contact
- Zoonotic diseases, These can be spread from livestock to humans eg brucellosis, bird flu, anthrax, rabies
- Parasitic diseases, Are due to internal parasites eg round worms, flatworms etc

Importance of diseases

- They reduce the quality of animal products
- It reduces the quantity of the animal
- They result in insufficient use of feeds
- There is retarded growth in animals
- Animals lose appetite
- There is emaciation
- It causes death of animals
- Abortion
- It results in infertility
- Blindness
- Lameness of animals

Causes of animal diseases

I. Predisposing causes

- Hereditary diseases where animals are born with infectious disease

- Age some diseases attack young animals or adult animals
- Climate, some diseases are more prevalent in the tropical region than the temperate region
- Food and water. Well-fed animals are more resistant and are not easily affected by diseases

II. Causative agents

- **Bacteria** These are unicellular micro-organisms that which multiply by binary fusion. They cause diseases by producing toxins and releasing substances that destroy their defensive mechanism. Bacterial diseases include TB, anthrax, foot rot and typhoid
- **Viruses**
- **Fungi**
- **Protozoa**
- **Fungi**
- **Nutritional diseases**
- **Poisons**
- **Injuries and damages**

How diseases spread

- Through introduction of diseased birds or livestock
- Through introduction of carrier animals that may look healthy
- By direct contact through feeders , drinkers, contaminated feeds and bags
- From carcasses of dead animals/ birds that have not been properly disposed off
- From impure water
- Through blood sucking vectors like tsetseflies, and ticks
- By rodents and birds that may carry the the disease and contaminate the animal
- From shoes and clothings of visitors
- From excreta of infected animals that may not have been disposed off properly
- Through the air incase of respiratory diseases like pneumonia influenza, CBBP
- Through eggs
- Through soil eg clostridium tetani which causes tetanus
- From fresh or deep frozen semen
- Through contaminated equipments like needles, syringes, and thermometers
-

Control of animal diseases

- treatment using recommended medicine
- Culling. Animals with diseases which are difficult to control or whose control is expensive are removed
- Quarantine
- Regular deworming
- Regular spraying
- Regular cleaning
- Adequate ventilation
- Proper disposal of contaminated water
- Isolate sick animals
- Proper disposal of dead animals

How to look after a sick animal

- Provide warm conditions during cold days
- Provide cool conditions during hot weather
- Provide clean and dry beddings to make them as comfortable as possible
- Provide a balanced diet with adequate vitamins
- Turning of the animals which are unable to move to avoid development of sores
- Dress wound in case present and apply fly repellants
- Maintain hygiene in the house
- Administer right doses at the right time
- Check and observe their condition regularly

Immunity

Is the ability of the body to resist diseases, it can be passive, natural or active

Natural immunity

This is the immunity developed by animals without man's interference

Active natural immunity results from an attack of diseases, when a disease attacks an animal, the body produces antibodies to fight the disease pathogen, if the animal recovers from the disease the antibodies may further prevent an attack by the disease again

Passive natural immunity is acquired by calves from their mothers through suckling colostrums

Artificial immunity

This is immunity induced by man, it can be passive or active

Active artificial immunity is acquired by giving animals a vaccine

Passive artificial immunity is acquired by giving the animals serum obtained from blood of an animal which has recently recovered from infectious diseases

Important livestock diseases

TICK BORN DISEASES

1 .East coast fever

Cause- Protozoa

Symptoms

- Enlarged lymph nodes especially along the dewlap
- Rapid rise in body temperature and a very high body temperature
- Nasal discharge
- Diarrhoea
- Hard breathing and coughing
- General body weakness
- Rough hair coat
- Miscarriages in pregnant animals
- Watery lymph nodes
- Red pustules under the tongue
- The animal loses appetite
- Death

Control

- Spray against ticks
- Use antibiotics and sulphur drugs to treat the side effects
- Treat the animal with drugs like Clexone and Butalex

1. Red water

Causes Protozoa

Symptoms of Red water

- High temperature

- Colored (red) urine
- Staring (rough) hair coat
- Jaundice

Control

- Control ticks
- Use antibiotics to control side effects

4 . Heart water

Cause Protozoa (Rickettsia)

Symptoms

- Nervousness
- Animal walks in circles and dies in convulsions
- Fluid in the body cavities including heart, glands, and spleen

Control ticks

5 . Anaplasmosis

Cause, Protozoa

Symptom

- Anemia
- Constipation
- Blood in urine and feces
- Fall in body temperatures
- Emaciation

Control

- Tick control
- Use Tetracycline or other antibiotics to control side effects
-

Tsetse borne

1 . Trypanosomiasis (Nagana)

Cause, Protozoa transmitted by tsetsefly

Symptoms,

- Emaciation
- Staring coat
- High temperatures
- Death

Control

- Tsetse fly control
- Use of trypanocidal drugs

BACTERIAL DISEASES

1 . Anthrax

Cause, Bacterial

Symptoms

- Rapid death without previous symptoms
- Muscular swelling
- High temperature
- Dark watery blood from body openings
- Excessive blown up stomach

Control

- Quarantine
- Quick disposal of carcasses by burial or burning at the site of death

2 . Foot rot

Cause, Bacteria

Symptoms

- Lameness as a result of swollen painful hooves
- Hooves may contain pus with a foul smell

Control

- Having a foot bath of copper sulphate
- Regular hoof trimming and removal of affected parts

- Use of antibiotics

Tuberculosis

Cause Bacterial

Symptoms

- Loss of appetite
- Weight loss
- Coughing
- Decrease in milk yield

Control

- Practising good hygiene
- Isolation testing
- Slaughter and burning of infected animals in situ

Contegious bovine pleuro pneumonia

Cause, Bacteria

Symptoms

- High temperature
- Grunting
- Chronic cough
- Decreased appetite
- Labored breathing
- Death

Control

- Vaccination

Viral diseases

Rinder pest

Cause: Virus

Symptoms

- High temperature
- Ulcers in the mouth and vagina
- Diarrhoea
- Nasal discharge
- Shedding of tears

Control

- Annual vaccination
- Slaughter and burning of infected animals
- Quarantine

Foot and mouth disease

Cause Virus

Symptoms

- High temperature
- Lameness
- Ropy saliva
- Blisters on tongue, mouth, top of hooves and other skinned areas
- Drop in milk production
- Vaccination every six months
- Quarantine
- Slaughter of affected animals

Swine fever (Hog cholera)

Cause Virus

Symptoms

- High fever
- Staggering
- Weakness
- Loss of appetite
- Constipation followed by greenish or dark brown diarrhea
- Chills

- Coughing
- Arched back
- Difficult breathing
- Dropping head
- Pigs tend to bunch out

Control

- No effective treatment known
- Vaccination at eight weeks of age
- Isolation of infected animals to reduce the speed of spread
- Slaughter affected pigs
- Disinfect premises
- Fencing to keep wild pigs out and domestic pigs indoor

PARASITISM IN LIVESTOCK

A parasite is an organism that feeds on another organism (host) without the host benefiting from the association

Classification of parasites

- **Endo parasites**

These live within the body of the host eg tape worms, liver flukes, protozoa

- **Ecto parasites**

These live on the outside surface of the animals body e.g mites, lice, ticks etc

- **Obligate parasites**

These live entirely as parasites i.e cannot independently live without the host eg liver flukes, tape worms

- **Facultative parasites**

These independently live without the host eg mosquitoes

General effects of parasite on the host

- Parasite deprive the host of its food there by causing nutrient deficiency
- Parasites transmit associated diseases eg ticks for East coast fever, Heart water, Red water

- Some parasites block body passages eg heavy infestation of tape worms causes blockage of the GIT
- Some suck blood from the host hence causing anaemia
- They destroy the host's skin
- Ecto parasites cause irritation and discomfort
- Parasites reduce growth rate of animals
- Lower the quality of animal products eg liver flukes in the liver
- Destroy animal tissues
- They cause loss of weight of the animal
- Some cause swelling under the jaws i.e Oedema

Symptoms of parasite infestation in animals

- Emaciation i.e loss of weight
- Coughing due to irritation
- Slow weight gain and retarded growth
- Rough or staring hair coats
- Pot belly
- Anaemia
- Diarrhoea
- Loss of appetite
- Death in severe cases
- Eggs and parts of the intestine in the dung
- Reduced production of animals eg that of milk

ECTOPARASITES AND THEIR CONTROL

1 . Mites

Mites belong to class Arachnida and order Acarina, they live on blood serum obtained from the skin punctures they inject toxins in skin punctures causing irritation and inflammation (swelling) . When they are many they lead to a condition known as mange which is a hair loss disease

Control of mites

- Spray the animal with acaricides
- Use old engine oil eg smearing it on punctures
- Regular cleaning of animal units and changing beddings

- Grooming of animals
- Heavy infestation of cheap structures can be controlled by burning them

TICKS

They belong to class Arachnida and order Acarina, they are blood sucking parasites and their hosts include cattle, sheep, goats, camels, donkeys, buffaloes etc

Adaptation of ticks to their mode of life

- They have pointed mouth parts for proper attachment to host and sucking of blood
- They have a flat body which enables them to hide in hairs and not to be wiped away by the tail
- Have four pairs of limbs for locomotion
- Have a dull color and cannot easily be seen
- Produce many eggs hence survival and reproductive rate is high
- Have a tendency to hide in strategic places where they can not be easily seen or removed

Effects of ticks on host animals

- Ticks cause blood loss from the host and cause anemia
- They create wounds on the host's skin which may lead to secondary infections
- They transmit tick borne diseases eg east coast fever
- Ticks lead to loss of weight of the host animal
- Reduce production eg of milk

QTN

Outline the economic importance of ticks

- Transmit diseases which lead to reduced costs of production through treatment of such diseases
- Deprive the host of its food hence reduced production of meat, milk etc Creates wounds on the skin which lower the quality hence lowering the economic value
- Increase the costs of production through buying acaricides to control them
- Heavy tick infestation may make many areas not to be grazed which reduces the production per unit area

Life cycle of ticks

Ticks can be grouped into two groups i.e soft ticks and hard ticks, Soft ticks lack a protective scutum eg *Ornithodoros moubata*, *Savignyi*, *Ortobius megnini* etc

Hard tissues have a hard protective scutum eg *Ambloymma*, *Hyalomma*, *Rhipicephalus*

Ticks can also be grouped basing on the number of hosts they require to complete their lifecycles i.e one host tick, two host tick, three host tick

Life cycle of a one host tick

- Female lays eggs on the ground
- Under favorable conditions eggs hatch into tiny larvae
- Larvae cling onto the grazing animal feeds, becomes engorged and moults into nymph
- While on the same host the nymph feeds, becomes engorged and moults into adults

Life cycle of a two host tick

- Adult lays eggs on the ground
- Under favorable conditions eggs hatch into tiny larvae
- Larvae cling onto the grazing animal
- Larvae feed, become engorged and moult into nymphs
- Nymphs also feed on the same animal become fully engorged and drop off the first host
- Nymphs moult and turn into adults which look for a second host and climb it
- They feed on the host, become fully engorged and lay eggs on the ground and the cycle begins again

Life cycle of a three host tick

- Mature adult lays eggs on the ground
- Under favorable conditions eggs hatch into larvae which climb the grazing animal
- Larvae feed, become fully engorged and drop off the host

- They moult into nymphs which look for a second host, climb it, feed, become fully engorged and drop off the host as fully engorged nymphs
- They moult into adults which look for a third host, climb it, feed, become fully engorged, lay eggs, and the cycle begins again

Diagram illustrating the life cycle of ticks

Methods of tick control

- Dipping / spraying using acaricides or hand dressing using concentrated acaricides like pyre-grease
- Hand picking and crushing them
- Practising rotational grazing
- Burning old pasture infested with ticks
- Ploughing of pasture paddocks infested with ticks
- Double fencing/ perimeter fencing

FLIES

Some flies are biting haematophagous (blood sucking) while others are nuisance flies,

The most important flies in east Africa include Tsetse flies These transmit trypanosomiasis i.e Nagana, midge flies, horn flies, blow flies, screw worm flies , tumbu flies etc

Control of flies

- Eliminating bushes around them
- Spraying using insecticides
- Use of trap to catch them
- Use of sterile male technique to control them from the ecosystem

LICE

Are wingless insects flattened from top to bottom biting lice suck blood while chewing lice eat the tissues, lice mainly cause irritation, discomfort and anemia

Control of lice

- Use of lindane dust
- Grooming of the animal
- Use of BHC (Benzene hexachlorite) dust

ECTO PARASITES

These are organisms that live inside the body of the animal eg helminthes (worms)

Examples of worms include tape worms, liver fluke, round worms

Symptoms of worm infestation

- Slow growth
- Digestive upset eg diarrhea
- Rough hair coat
- Swelling of the belly
- Reduced production of meat, milk, wool and work
- Weakness/ dullness
- Oedema especially in the jaw region
- Emaciation

Liver flukes

Identification

The body is leaf shaped, flattened dorso-ventrally and covered with a cuticle, it has a broad anterior end bearing the head to be, it has two suckers i.e an anterior or oral sucker and a posterior ventral sucker by which the fluke adheres to the walls of the bile ducts

Most liver flukes belong to Genus *Fasciola* which inhabit the liver and bile ducts of cattle, sheep and goats . The most common species is *gigantica*

Adaptations of liver flukes

- They have dorsal ventrally flattened bodies which allows them to squeeze themselves through the muscles and vessels of the body
- They have two suckers i.e anterior sucker for nourishment and posterior sucker for attachment to bile dcuts

- They produce mucus around their bodies to protect themselves from digestive enzymes
- They have lost some of the system eg digestive system to reduce on their energy requirement

Symptoms of liver fluke infestation

- Digestive upset
- Depression and dullness
- Oedema
- Anaemia due to haemorage caused by liver damage
- Death

Life cycle of liver flukes

- A mature liver fluke lays many eggs, which pass through the bile ducts and enter the digestive system of the animal and are passed out through faeces
- Under favorable conditions eggs hatch into ciliated embryo called **miracidia**, the miracidia swim about in water in search of an intermediate host (water snail)
- The miracidia penetrates the body of the snail, remains in blood, loses cilia, and is transformed into a bag like structure known as a **sprocyte**
- The germ cells under go repeated divisions and give rise to a second generation to a type of larvae known as **redia**, the redia gives rise to a second generation of daughter redia
- The daughter redia develop into a cercaria which force their way out of the snail actively swim in water
- When the cercaria comes into contact with the aquatic vegetation, they lose the tail, adhere to the vegetation by suckers and secrete a cyst around them selves which is responsible for indigestibility by the host enzyme and also protects them against diverse conditions
- They remain so until they are taken up by the host animal, the cyst wall is dissolved in te alimentary canal of the host and the flukes are set free in the gut from which they pas to the bile duct and the cycle begins again

Diagramatic illustration of life cycle of a liver fluke

Methods of controlling liver flukes

- Collecting and killing snails
- Draining water logged areas in pastures, swamps etc
- Regular deworming of the animals
- Giving animals clear safe water
- Burning of heavily infested areas

TAPEWORMS

These are large worms living in small intestines of man (primary host) secondary hosts include cattle, goats, sheep, horses, rodents, birds and pigs etc

Structure of a tape worm

N.B Tapeworms have no alimentary canal and food is absorbed through the permeable cuticle of the worm

Mature tapeworms have a well developed genital organ situated towards the posterior end

The nervous and the excretory systems are simple

Tape worms of economic importance include the following *Tania sagnata* (beef tapeworm) *Taenia solium* (pork tape worm) *Davainea* found in poultry, *Taenia pisiforios* found in dogs, cats, mites, rabbits

Adptations of tape worms to their mode of life

- They have suckers for attachment to the walls of the intestine of the primary host
- They have lost some of the body parts (organs) to reduce on the body size
- They secrete mucus around their bodies to protect them selves from digestive enzymes
- They are capable of living in anaerobic conditions

Life cycle of a tape worm

- Mature tapeworm detach them selves from the tape worm and are secreted out together with human feaces, the segment soon decays and the eggs containing a six hooked embryo are blown off and adhere to the neighboring vegetation

- Eggs are swallowed by the intermediate host the Orbatid mites which are found numerous around the roots of grasses
- The embryo lose their hooks and develop into a cysticercoids
- The infested mites are taken in by the grazing animal . The cyst wall dissolves in the GIT and the larvae are set free and enter into the muscle of the secondary host
- When man eats un cooked or half cooked meat infested by larvae, the larvae are introduced into the intestines of man, attach them selves firmly to the intestinal walls form new proglottids and the cycle begins again

Methods of controlling tape worms

- Proper use of toilets and latrines to break the life cycle
- Meat should be thoroughly cooked to kill the larvae
- Regular deworming of livestock
- Freezing meat at very low temperatures

ROUND WORMS (NEMATODES)

The most important parsetic round worm are the **Ascaris vitulonim**, It lives in the small intestines of cattle, goats, sheep and feeds on digested food of the host animal, large numbers of worms get knotted together causing intestinal abstraction which can be fatal

Adult worms secrete toxins which lead to intestinal or nervous disturbances, inflammation and haemorrhages occur when they penetrate the lungs, round worms are capable of migrating to different organs such as liver, gall bladder, then towards the mouth, trachea,to thelungs causin death of the animal

Life cycle of Ascaris

- The adult lays numerous eggs which pass out along in feaces of the host
- Under favorable conditions (warm, moist and shady eggs develop into embryos between 2-3 weeks, if the conditions are not favorable , growth and development are rested and the eggs remain dormant for several years
- The host animal swallows eggs containing the embryos along with food or water
- The egg shells are dissolved by the intestinal juices and the larvae are set freeult worms a
- The larvae burrow into the intestinal walls into the blood and are carried into the liver, heart, lungs,trachea, pharynx,oesophagus, stomach and then returned back to the intestines where they grow and moult twice before adults stage in 6 weeks

- Copulation takes place between adult worms which give rise to eggs and the cycle begins again
Other species of parasitic round worms include *Ascaris lumbricoides*, *Ascaris megalocephalus* in horses, *Ascaris ovis* in sheep etc

Basic occupational health, safety and environmental protection practices when handling animal health.

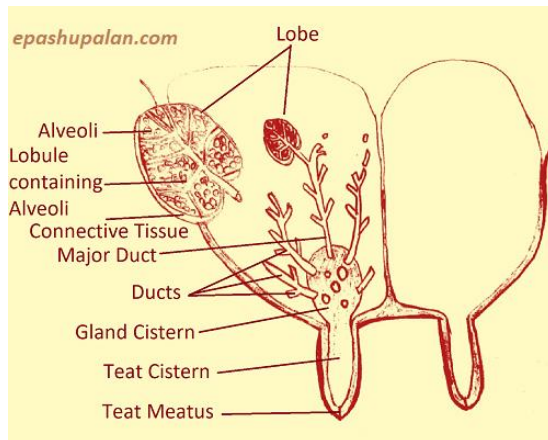
- Wear protective clothing e.g. overall, gloves, gumboots, helmet when handling agro-chemicals.
- Disinfect tools used in treating animals.
- Burn or bury dead animals immediately after death.
- Put a disinfectant in the footbath at the entrance of animal houses.
- Dispose off empty containers of agro-chemicals safely according to local regulations.
- Don't dispose off unused chemicals into water bodies
- Don't use containers for carrying food and water to keep agrochemicals.
- Don't mix one agro-chemical with another.
- Keep all agro-chemicals under lock and key
- Keep all agro-chemicals away from children's reach.
- Read and follow the manufacturer's instructions before using any agrochemical.

HARVESTING FARM ANIMALS AND ANIMAL PRODUCTS

The main animal products include meat, milk, hides and skin, in this chapter, you are going to understand how to harvest farm animals and their products.

Milk production

Structure of the udder



The udder is made up of four quarters or glands each drained by its own teat, the four glands are closely bound together but the milk from the different glands does not mix up

The udder is suspended from the pelvic bones by strong ligaments and abdominal muscles. It is divided into two halves by the medial suspensory ligaments

The secreting glands are composed of tiny spaces called alveoli. These are lined by cells which secrete the milk. The alveoli open into small ducts which converge into large ducts which open into the udder or gland cistern

At each convergence is a sphincter muscle which holds the milk and will not release it until the cow is stimulated

The lymph gland in the udder acts as filters of the foreign bodies and reduces. They also impart immunity to the calves through colostrum

Lactation / milk production can be divided into three parts

- **Milk synthesis** this is the making of milk by the secretory cells of the alveoli. The cells of the alveoli extract nutrients and water from the blood stream and use these nutrients to make the milk it is controlled by LH
- **Milk secretion** this is the release of milk by the secretory cells into the alveoli, the rate of release depends on the pressure in the alveolar lumen, therefore the more the cow is milked the more milk it will give
- **Milk letdown** this is the movement of milk to the lower parts of the udder i.e gland cistern and teat canal ,It is influenced by the hormone oxytocin
- When the animal is stimulated by suckling, massaging the udder, the nerve impulses are sent to the brain.
- This causes the hormone to be released to the blood stream
- The hormone causes the udder muscles to contract thus milk flowing down
- The squeezing of the teat allows milk to be ejected

Causes of milk let-down

- Massaging of the udder with warm water
- Presence of the calf
- Noise made a by the milking tools, containers, cans.
- Provision of feeds, concentrates
- Approaching milking of time
- Entering the milking parlour
- Suckling by the calf
- Presence of a milk man

N.B If the cow is frightened it produces adrenaline, this limits blood supply to the udder and so stops oxytocin from reaching the udder and so there will be no milk letdown

Qualities of a good udder

- Large capacity
- Should have four regularly placed teats
- Teats should be of even size

Abnormalities of the udder

- Blood in the milk, can be caused by mastitis or a broken blood vessel
- Congestion of the udder, swelling of the udder due to accumulation of fluids before calving, it can be controlled by pre-milking
- Failure of milk letdown, this can be treated by injection of oxytocin hormone
- Mastitis, is an inflammation of the udder caused by the bacteria. It is spread by flies, milker's hands udder towel and teat cups of milking machines

Symptoms of mastitis

- Blood clots in milk
- Inflammation/swelling of the udders
- Watery milk
- Rejection of milking due to pain in the udders
- Milk with clots
- Affected udder may become dead and produce no milk
- Death of the affected animal

Control of mastitis

- Disinfecting utensils immediately after milking
- Use of the strip cup before milking to detect mastitis
- Washing hands before milking
- Treating infected animals with antibiotics
- Maintaining hygiene in the milking parlour
- Disinfecting teat cups
- Stripping the udders
- Treat sores on the teats and prevent cracking of the teats by using milking salve
- Milking of infected animals last to avoid infection normal animals by the milkman's hands
- Prompt treatment of infected animals

Treatment of mastitis

- Infusion of an antibiotic into the udder
- Intravenous or intramuscular injection of antibiotics such as streptomycin
- Applying hot and cold pads on the udder to increase milk letdown and help in the removal of the infected milk which facilitates healing

Why does milk easily go bad/ Perishability of milk

- It contains a lot of sugar.
- It contains a lot of water.
- It contains bacteria.
- It absorbs bad smell
- It contains a lot of nutrients.
- It is easily attacked by microbe.

MILKING

This is the removal of milk from the teats, it involves three stages i.e preparation before milking, actual milking and stripping

Preparation for milking

- Clean the udder of dust and odours
- Assemble all necessary equipment

- Bring the cow into the milking parlor to enable them to quieten and settle down
- Restrain the animal
- Brush the hind quarters of the cow to remove loose hairs, dust and dung
- Wash the udder and the teats with warm water and dry it with a towel
- Draw a few streams of milk from each teat into a strip cup to detect mastitis
- Give the animal feeds

Milking procedure / actual milking

Milking should commence immediately after washing and drying the udder to utilize the short lived effect of oxytocin hormone

Methods of milking

- Hand milking, the teat is held between the index finger and thumb, milk is obtained by compressing the fingers against the teat, the next index fingers are relaxed to allow the teat canal to refill
- Suckling by the calf, the suckling by the calf creates a partial pressure outside the teat and inside the buccal cavity of the calf, milk flows from the udder into the calf's mouth
- Machine milking, this uses a machine which is power driven, the machine has a milking unit which holds the teats, a pulsation unit which rhythmically creates a vacuum in the milking unit, a vacuum supply unit which creates the vacuum and a storing unit that holds and stores milk, the vacuum in the milking unit causes milk to flow from the teats into the milking unit

Stripping

This is done to remove the last milk, the udder quarters are massaged and squeezed, it ensures that the udder is completely empty and increases milk letdown, it controls mastitis since it denies the bacteria which would cause an infection

Rules of good milking

- Avoid exciting the animal before and during milking because this induces the animal to produce adrenalin which cuts off blood supply hence stopping milk letdown

- Prepare and assemble all milking equipments in advance to ensure that the milking period is not interrupted
- The milking period should not be interrupted
- Milk at the same time everyday to get the cows used to the routine
- Prepare the cow for milk letdown by washing the teats with warm water and a cloth
- Begin milking soon after preparing the animal
- Use a strip cup to test for mastitis
- Strip the udder clean

Clan milk production/ maintenance of milk quality

- Ensure the cows are healthy i.e disease free
- Ensure the cows are clean
- The milking utensils should be clean
- The milking man should be free of diseases
- The personel handling milk should be clean
- The milking man should cut his finger nails short to avoid injuring the udder
- Apply milking salve to avoid cracking the teats
- The milk should be strained to remove dirt
- The milk should always be covered after milking
- The milk should be cooled rapidly to reduce multiplication of bacteria
- Milk should be properly transported in clean facilities
- Flies must be properly controlled
- The area around the milking shed should be cleared off plants that have a bad odour

Factors affecting milk yield

- Age, milk yield increases with age up to a certain point
- Breed, some breeds give more milk than others
- Temperament, some animals are easier to milk than others
- Heat, animals on heat give reduced milkyield
- Availability of water, its availability increases milk yield
- Handling/management, good handling gives a good milk yield

- Parasites and disease, they reduce milk yield since they lead to stress
- Climate, cool climate gives the animal less stress and hence good yields
- Feeding, well fed animals give better yields than poorly fed animals

Factors affecting milk composition

- Age of the animal ,as the animals grows old the fat percentage and solids not fats decreases
- Stage of lactation and pregnancy, the percentage of the contents tend to increase in the second half of lactation
- Condition of the animal, under extreme conditions of thinness the BF content of the milk reduces greatly
- Completeness of the milking, fat content increases progressively through out milking
- Time of milking, morning milk has a lower fat content than milk produced through out the day
- Temperature, fat content tends to increase during cold days
- Breed differences, there is a large differences between the breeds highest in Zebu,Jersey and Friesian
- Diet of the animal, a high fibre content increases BF content because it encourages acetic acid production
- Diseases, mastitis reduces lactose, potassium and casein content of the milk

Factors affecting the quality of the milk

- Safety, good milk should be free from bacteria
- Nutritive content, milk must have most of the nutrients
- Cleanliness, must be free from dust, bacteria, blood or pus
- Flavor, must be free from any taints or flavors
- The environment around the milking parlor, should not have taints as the milk may absorb taints from the environment
- Feeds consumed by the animal, some feeds have strong flavors that may be felt in the milk

- The utensils in which the milk has been stored
- Diseases, cows with mastitis produce milk which is salty to taste
- Bacterial contamination of the milk, this leads to production of an acid taste in the milk
- Oxidation, arises from exposure of the milk to sunlight which leads to auto oxidation of the fats producing a bad odor
- Accidental addition of medicants, insecticides, disinfectants, paraffin or urine in the milk

How to avoid bad flavors in milk

- Milking in a clean environment
- Using clean utensils
- Giving animals feeds which donot have taints/ bad ordors
- Vaporization using steam

Keeping quality of milk

This is the length of time the milk will remain fresh

Why does milk from the tropics easily go bad

- Tropics have many bacteria which enter the udder and contaminate milk even before milking
- Milk is very nutritive and so attracts many bacteria which will enter the milk once exposed
- High environmental temperatures in the tropics favor the multiplication of bacteria that cause milk spoilage
- Milk is a hydrophobic colloid that coagulates easily on contamination

Milk and its products

Milk is processed to improve its appearance, palatability and keeping quality

Preparation of milk for markteing

- Milk is covered to prevent contamination after milking
- Its then strained using a milk strainer or clean cloth to remove hairs and dust

- Its then tested using a lactometer to find the specific gravity i.e to find out whether it has been adulterated by adding water or solid impurities
 - The milk is then boiled to kill the bacteria and delay spoilage, it is then kept in a cool place or refrigerator
 - Milk is then measured to know the quantity to be sold and records kept
 - The milk may also be pasteurized or sterilised i.e heated at a controlled temperature for a long period of time to kill all spoilage organisms
 - The milk may be centrifuged, i.e rotated at very high speed to throw away the dust particles
 - Milk may also be blended to give a uniform butter fat content especially if collected from different breeds
 - The milk may be homogenized , i.e the larger fat globules are broken down to smaller ones to give a uniform mixture
 - The milk may then be packed into clean containers and sealed for safe transportation and sale
-
- ❖ **Cheese** This is concentrated milk made by coagulating milk using rennin obtained from calves or made synthetically, milk is allowed to sour, heated to harden and then liquid (whey) forced out
 - ❖ **Ghee** made by heating butter to evaporate the water content
 - ❖ **Cream**, A thick white or pale yellow liquid that rises at the top of milk is removed
 - ❖ **Butter**, made by churning whole milk
 - ❖ **Yoghurt**, this is semi-solid food prepared by fermenting milk using bacteria, flavours and sugars may be added to improve the taste

Meat and meat products

Meat is all skeletal muscles or tissues that can be utilized as food. Meat by products includes horns, blood meal, and hooves. Horns and hooves are used for making glue and buttons. Ruminant contents can be used for feed ingredients.

- Before slaughter, animals are rested and starved for up to 24hrs. This allows emptying of the gut, reduces spoilage and meat contamination.
- Resting conserves stored glycogen that is converted to lactic acid after slaughter. This has a preservative effect on the meat.
- Stunning is carried out using a hammer, gun or electric shock. This is aimed at reducing pain during slaughter.

- The neck of the animal is cut during slaughter. The animal is then allowed to bleed adequately to reduce meat spoilage. Skinning and cutting the carcass to remove internal organs is done.
- Inspection is then carried out to ensure that the meat is suitable for human consumption.
- Grading is then carried out. Points considered are the level of fat, texture of meat and colour.
- Aging and tenderization. This is aimed at making meat more palatable. It is stored at a temperature of 2 degrees for 4-6 weeks.
- Curing is the process of preserving meat. It is done to preserve and maintain its red colour and add flavor. Sodium nitrate sugar and spices are added.

Meat spoilage

This is caused by invasion by bacteria. This depends on:

- The number of micro-organisms in the gut at the time of slaughter.
- The extent of bleeding at the time of slaughter.
- The conditions of the place after slaughter/sanitary conditions.
- The conditions of the storage place. It should be clean and cold.

Factors that influence the rate of meat spoilage

- Temperature, tropical temperatures are high and these encourage rapid multiplication of bacteria and encourage rotting
- Rumen content at slaughter, may contaminate the meat and increase the rate of spoilage
- Diseases, carcasses of animals that have been diseased or are undergoing treatment tend to deteriorate faster than those that are normal
- Slaughter house, unhygienic slaughter houses tend to increase the rate of contamination
- Transportation of meat in unhygienic containers leads to meat spoilage
- Moisture content of the meat

Factors that make meat unsuitable for human consumption

- Parasitic infestation. Tape worms, round worms make meat unsuitable for consumption
- Animal diseases. Notifiable diseases such as Rabies, anthrax, contagious abortion affect the quality of meat
- Animal poison. Animals that have been treated with dangerous chemicals should not be slaughtered.
- Contamination during and after slaughter. The slaughter environment should be free from flies that can transmit diseases
- Improper storage. This encourages multiplication of bacteria
- Drugs, some time must pass after treatment of the the animal with certain drugs before it can be eaten
- Bad flavors , meat may have bad flavors if the animal has been fed on Mexican marigold
- Rotting/ attack by the bacteria
- Un hygienic slaughter house
- Poor bleeding, leaves a lot of blood in the meat and encourages rotting
- Age of the animal, old animals become tough and fibrous hence may be used to make dog feed or animal feeds other than being eaten by man
- Meat quality, the ratio of fat and muscle must be acceptable
- Un hygienic transportation may also contaminate the meat

Hides and skins

Hides are got from big animals like cattle while skins are got from small animals like goats, sheep

These are important animal products that are processed into leather. Leather is used for making shoes, hand bags, carpets and belts.

Importance of hides and skins

- Provide construction materials
- Provide clothings
- Provides employment opportunities for the people involved in processing and marketing of hides and skins
- Are used in making leather
- Are used as souvenirs or gift items
- Are used in cultural and religious practices

- Are used in making musical instruments

Procedure of getting hides and skins

- Flaying/ removing from the animals body
- Washing it in running water to remove dung and blood
- Draining and freshing to remove all the meat and fat
- Trimming to remove all the irregular flaps
- Preservation either by wet salting, drying or suspension drying
- Tanning, treating hides and skins with tannic acid to turn them into leather

Factors affecting the quality of hides and skins/sources of damages

➤ **When the animal is still alive**

- Scratches and injuries by sticks and thorns
- Scratches by barbed wire
- Horning by other animals during fights
- Through skin diseases such as ring worms and cow pox
- Parasitic attack such as ticks and tsetse flies
- Poor handling like throwing the animal down during routine operations
- Through parasitic attack such as ticks, mange
- Poor branding. Deep branding marks made on important parts of hides
- Wounds sustained from beatings
- Mechanical damage during transportation of animals

During slaughter

- through handling of animals such as throwing down and dragging of the animal
- incomplete bleeding that causes blood to remain in the hide and encourage growth of bacteria
- the place of slaughter should not be with sharp objects that could damage the hide
- bad flaying that cause flay cuts
- fouling the hide with manure causing rotting
- folding the green skin hair inside may cause anaerobic conditions that cause rotting

During treatment

- over stretching of the hide during curing

- improper drying
- over drying when exposed to direct sunshine
- rain water may collect during rainy seasons
- poor methods of drying when hides and skins touch the ground

After treatment

- the moisture content if high during storage
- vermin (rats) and insect pests (larvae of the hide beetle) may cause considerable losses
- leaking roofs of the store
- during transportation as a result of mishandling during loading and unloading, rain etc
- fraudulent practices such as keeping hides and skins in the open over night to gain weight

Differences between hides and skins

Hides	Skins

Processing of hides and skins/treatment

After flaying, hides and skins are washed in water to remove dung, dust, blood and grasses. Fats and meat are then scrapped off as well as trimming to remove unnecessary edges.

Curing is done by either

- Air drying. Hides and skins are suspended on frames using strings. They are then folded hair inside. Hides are dried by pegging on the ground may harden causing cracks

- Salting. In wet salting, salt is sprinkled on the flesh side of the hide or skin which is then piled up.
Tanning. Dry hides and skins are graded and treated with tannic acid to turn them into leather

Preparation of hides and skins for sale

- Wash hides and skins to remove dung and soil
- Hang the hides and skins to drain off all the water
- Remove flesh and fats from the hides and skins(fleshing)
- Trim the hides and skins to remove the odd flaps
- Curing /salting/drying to remove moisture completely
- Treat the hides and skins with pesticides to control beetles
- Grading hides and skins before balling to remove bad hides
- Use balling iron and ropes to avoid damages
- Weigh hides and skins before sale
- Fold hides and skins inside out along the backline to avoid spoilage
- Carry out proper storage to avoid damage by moisture or vermin