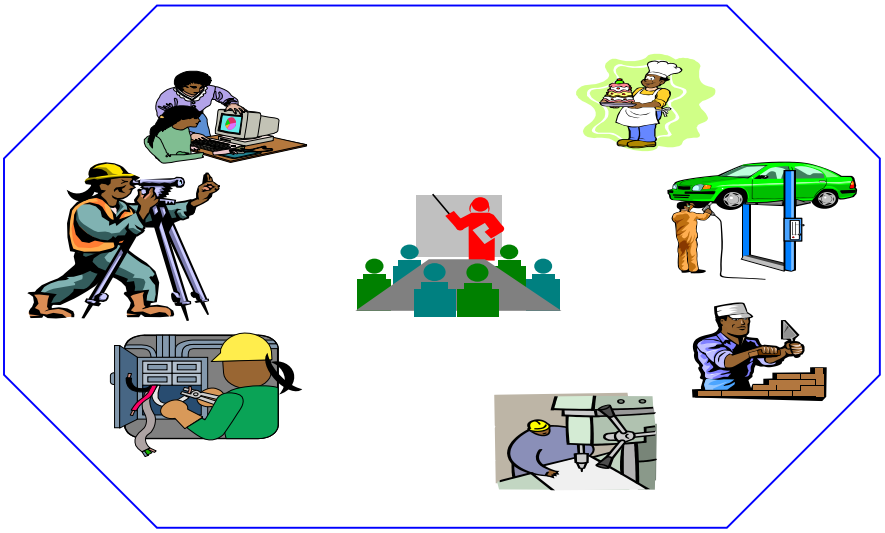
Animal Health care Level-IV

Based on March 2018, Version 3 Occupational standard



Module Title: - Performing General Animal Health Care

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LG# -28	LO1#- Monitor animal health needs

Instruction sheet

Learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Maintaining personal hygiene and cleanliness
  - ✓ Use of proper PPE
  - ✓ An awareness of risks associated with animal handling and care
  - ✓ The handling of chemicals and drugs
- Monitoring health and wellbeing of animals closely
- Identifying abnormal animal behavior or condition and signs of illness or injury
  - ✓ Abnormal animal behavior
  - ✓ Signs of illness or injury
- Identifying and planning treatment options for broad categories of diseases
  - ✓ Categories of diseases
  - ✓ Animal treatments
  - ✓ Prophylactic and therapeutic treatments
- Separating and caring sick or injured animals
- Maintaining required health records

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Maintain personal hygiene and cleanliness accordance to OHS procedures
  - ✓ Use of proper PPE
  - ✓ An awareness of risks associated with animal handling and care
  - ✓ The handling of chemicals and drugs
- Monitor health and wellbeing of animals closely
- Identify abnormal animal behavior or condition and signs of illness or injury
  - ✓ Abnormal animal behavior
  - ✓ Signs of illness or injury
- Identify and planning treatment options for broad categories of diseases

- ✓ Categories of diseases
- ✓ Animal treatments
- ✓ Prophylactic and therapeutic treatments

- Separate and caring sick or injured animals
- Maintaining required health records

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test”

Information sheet 1: Maintaining personal hygiene and cleanliness.

1.1. Introduction

Good personal hygiene involves keeping all parts of the external body clean and healthy. It is important for maintaining both physical and mental health.

In people with poor personal hygiene, the body provides an ideal environment for germs to grow, leaving it vulnerable to infection. On a social level, people may avoid a person with poor personal hygiene, which may result in isolation and loneliness.

1.2. Types of personal hygiene.

The following list is a good starting point for someone looking to build a personal hygiene routine.

- **Body washing**

Several million sweat glands cover the human body. When bacteria break down sweat, the process creates a smell or body odor.

Washing the body will help prevent skin irritation, as well as removing the bacteria that cause body odor. Washing the hair removes oil and keeps a person looking clean and fresh.

- **Hand washing**

Regular hand washing is one of the best ways to avoid spreading communicable diseases.

The recommend washing hands at certain times are

- Before, during, and after preparing food
- Before eating food
- Before and after looking after anyone who is vomiting or has diarrhea
- Before and after treating a cut or wound
- Before surgery and treatment
- After going to the bathroom
- After changing diapers or cleaning up a child who has used the toilet
- After blowing the nose, coughing, or sneezing
- After touching garbage or dirty surfaces or objects
- After handling pets or pet-related items, such as food.

1.3 How to maintain good personal hygiene

Knowing how to maintain good personal hygiene can make it easier to build a routine. A person should have some basic knowledge of the following types of hygiene:

1.3.1 Hand washing

1. Wet the hands with clean, running water, then turn off the tap and apply soap.
2. Lather the hands by rubbing them together with the soap, remembering to reach the backs of the hands, between the fingers, and under the nails.
3. Scrub the hands for at least 20 seconds, which a person can time by humming the "Happy Birthday" song twice.
4. Rinse the hands well under clean, running water.
5. Dry the hands using a clean towel or air dry them.

1.3.2. Body

It is advisable to shower or bathe daily, using soap and water to rinse away dead skin cells, oil, and bacteria. People can pay special attention to areas that accumulate more sweat, such as the armpits, in between the toes, and the groin area.

They should also wash their hair with shampoo at least once a week, or more if necessary. Applying deodorant when fully dry can help prevent body odors.

Table 1: identifies PPE categories, types and potential applications in veterinary medicine**.**

Category	Types	Application
Body Protection	▪ Coveralls ▪ Scrubs ▪ Lab coats ▪ Gowns	▪ To protect from skin contact with blood, body fluids, chemicals, sun exposure or vectors (e.g., ticks or mosquitoes) and reduce the risk of disease transmission ▪ To prevent contamination of street clothing
Hand Protection	▪ Examination gloves (nitrile, vinyl) ▪ Palpation sleeves ▪ Chemical-resistant ▪ Work gloves ▪ Cut-resistant gloves	▪ To reduce risk of disease transmission ▪ To prevent exposure to body fluids during examinations ▪ To protect from cuts, punctures, bites, scratches, abrasion ▪ To provide protection from skin contact when handling chemicals (e.g., formalin)
Eye and Face Protection	▪ Safety glasses ▪ Safety goggles ▪ Face shield	▪ To protect the face and eyes from exposure to blood, body fluids, chemical splashes
Foot Protection	▪ Closed-toe ▪ Slip resistant ▪ Protective toe-cap and sole ▪ Rubber boots ▪ Overshoes ▪ Shoe covers	▪ To protect the foot from punctures, cuts, bites, crushing, exposure to infectious materials or chemicals ▪ To reduce the risk of slips and falls when working in wet environments ▪ To reduce the transmission of pathogens
Respiratory Protection	▪ Air purifying respirator	▪ To reduce inhalation exposures to airborne agents (e.g., allergens, gases, vapours, pathogens, bedding and feather dusts)
Hearing Protection	▪ Earplugs ▪ Earmuffs	▪ To reduce exposure to high noise levels due to sources such as, barking dogs, squealing pigs, roosters/chickens, cattle chutes

1.6. Risks associated with animal handling and care

Working with laboratory, farm and clinic animals, or tissues from laboratory animals, is associated with potential health hazards to humans. These hazards include

1.6.1. Physical Hazards

- Animal Bites
- Scratches
- Kicks
- Allergic reactions
- Noise etc

Animal bites, scratches, and kicks are ubiquitous hazards whenever working with animals, either in the laboratory, or in other locations. Most of these injuries, however, are easily preventable with proper training in animal handling procedures and by proper procedures. Knowledge of animal behavior is important in predicting and responding to the animal's reaction. It is essential, both for the animals and for the human handler's sake that each person be properly trained and proficient at handling the animals under their care. New personnel should be fully trained and instructed before handling animals. All personnel injured by animal bites or scratches should immediately report the incident to their supervisor and the Department of Environmental Health and Safety after initial first aid procedures has been completed. All animal bites are potentially serious incidents because of the high potential for disease transmission and local infection from the animals contaminating oral flora. Medical attention should be sought in all but the most trivial injuries.

- **Sharp materials**
  - ✓ Needles
  - ✓ Broken glass
  - ✓ Syringes
  - ✓ Sharp materials
  - ✓ Pipettes
  - ✓ scalpels
  - ✓ Scissors etc.

In laboratory, surgery and clinic animal facilities and pose a hazard to personnel. Everyone in the laboratory animal facility has a responsibility to know how to handle potentially dangerous objects and how to properly store these items.

- **Machinery**

Tunnel washers, rack washers, autoclaves, floor polishers, etc., all pose potential risk to the operator or others if improperly used. Personnel using the equipment in the facility should be familiar with the proper procedures for use and follow standard procedures when using the equipment. The Laboratory Animal Resources supervisor should be immediately notified if any piece of equipment is not functioning normally and the equipment should not be used until a determination of potential safety problems has been made.

- **Noise**

Exposure to intense noise can and will result in impaired hearing. Chronic noise-induced hearing loss usually involves the higher pitched sounds, is permanent, and cannot be treated medically.

- **Ergonomic Hazards**
  - ✓ Improperly adjusted workstations and chairs.
  - ✓ Frequent lifting.
  - ✓ Poor posture.
  - ✓ Awkward movements, especially if they are repetitive.
  - ✓ Using too much force, especially if it's done frequently.
  - ✓ Vibration.

Laboratory personnel may also be involved in the handling of larger pieces of equipment for research purposes within the facility. Handling large loads improperly or performing repetitive tasks may result in chronic injuries. Proper procedures for handling all heavy loads should be adhered to and safety equipment and load assistance equipment used to reduce potential injuries. Employees with existing physical handicaps or injuries should consult with the occupation health physician and their workday procedures should be altered to prevent re-injury.

- **Allergies**

Among the most common occupational hazards associated with working with laboratory animals is the development of allergies. The prevalence of allergies in animal-care

workers has been estimated from 10% to 44% while it is estimated that nearly 10% of all personnel working with laboratory animals will develop occupation-related asthma. Several studies have suggested that persons with pre-existing allergic conditions, such as hay fever, are more likely to develop allergies to laboratory animals. While nearly 90% of personnel without any history of allergic reactions never develop allergies to laboratory animals, up to 73% of personnel with pre-existing allergic disease will develop allergies.

1.6.2. Biologic hazards

Example of Biological hazards

- Bacteria
- viruses
- Insects
- Plants
- Birds
- Animal
- Zoonotic Diseases

Zoonoses are diseases transmitted between animals and man under natural conditions.

Some zoonotic animal diseases

- Hantavirus
- Hepatitis A
- Rabies
- Cat-Scratch Fever
- Tuberculosis
- Psittacosis
- tuberculosis
- Rat-Bite Fever
- Brucellosis
- Leptospirosis
- Campylobacteriosis
- Anthraxis

1.7. Chemicals

Chemical hazards - Anesthetic gas, ethylene oxide, insecticides and disinfectants, latex glove allergy, acid

- **Corrosives:** These are chemicals that can cause irreversible bodily harm such as hydrochloric acid.
- **Irritants:** Exposure to irritant chemicals can result in reversible inflammation of the contact skin area. Examples of irritant chemicals include strong solvents.
- **Teratogens:** This class of chemicals can cause birth defects when employees are exposed to them. A popular teratogen in the workplace is thalidomide.

- **Sensitizers**: A sensitizer, such as an isocyanine, can trigger allergic reactions upon exposure.
- **Some lab chemicals detergents, disinfectants, acids, drugs Acaricides etc**
- **Mutagens**: Exposure to this type of chemicals can lead to negative gene mutation and damage to the chromosomes. A good example of this chemical is benzene
- **Carcinogens**: A carcinogen is a chemical that can trigger malignant growth in body cells; thereby potentially causing cancer. Asbestos is a common carcinogen.

Employees can be exposed to these chemicals through **inhalation, direct or indirect skin contact, ingestion, and injection.**

1.7.1. Handling chemicals and drugs to minimize risks

Veterinary medicine and animal care workers are at risk of exposure to many different chemical hazards including glutaraldehyde and other disinfectants, hazardous drugs, latex, pesticides, and waste anesthetic gases. Exposure to these chemicals may occur by dermal contact (touching the skin) and/or inhalation (being breathed in). Splashes may result in chemical contact with the skin, eyes, or mucous membranes.

Hazardous drugs are defined as having specific health effects (such as skin rashes, cancer, and reproductive effects) and high toxicity at low doses [NIOSH 2004]. Most hazardous drugs in veterinary medicine are used to treat animal illnesses such as cancer. The risk of exposure for veterinary health care workers is similar to that for human healthcare settings.

1.7.2. Veterinary workers may be exposed to hazardous drugs when they

- Handle drug vials
- compound
- Administer, or dispose of hazardous drugs
- Clean up spills
- Touch surfaces that are contaminated with these drugs; or clean bedding, cages, kennels, or waste of treated animals.
- Skin absorption
- Inhalation and ingestion are the most likely ways these workers may be exposed.

- Needle stick or sharps injuries pose a risk of exposure in veterinary health care settings

1.7.3. Controls recommendations on handling hazardous drugs and waste

- **Training Requirements**

Train workers to recognize and understand the risks of working with hazardous drugs, and the risks of working in an environment where these drugs are handled. Train workers how to care for and use personal protective equipment (PPE)

- **Receiving and Storage**

Begin exposure control when hazardous drugs enter the facility. Ensure that all personnel are able to identify hazardous inventory upon arrival. Handle all hazardous inventories with gloves. Label clearly with a hazardous designation. Store hazardous drugs separately from other inventory, and separate from food/drink. Keep a spill kit available in case inventory arrives damaged

- **Drug Preparation**
  - ✓ Prohibit eating, drinking, chewing gum, applying cosmetics, or storing food or drinks within the hazardous drug preparation area.
  - ✓ Use PPE, including chemotherapy gloves, non-permeable gowns, respiratory protection, eye protection, shoe covers and spill kit.
  - ✓ Use a proper containment device:
  - ✓ Use a proper closed-system drug transfer device in low-volume facilities
  - ✓ Properly clean all equipment, counters, and other surfaces.
  - ✓ Bleach solution can be used to disinfect and a strong detergent and water rinse may remove most drug residues. Repeating the cleaning steps should provide addition drug removal.
  - ✓ Wash hands with soap and water after drug compounding.

1.7.4. Storing Drugs

Policy: Drugs and biological are to be **stored** in a secure and orderly manner under proper temperatures and are to be accessible only to licensed nursing and pharmacy personnel. All medications are to be stored in the containers in which they are received, internals separately from externals and both separately from poisons.

1.7.4.1. Methods of storing

- All drugs and biological are to be stored in a secure and orderly manner without crowding. Drugs are to be accessible only to licensed technicians and pharmacy personnel.
- Drugs are to be dispensed by the pharmacy in containers which meet official requirements for stability. All drugs are to be kept and stored in the containers in which they are received. No drug is to be transferred from one container to another.
- For external use only are considered external medications.
- Drugs for internal use are to be stored separately from drugs for external use. Both are to be stored separately from poisons.
- Germicides, disinfectants, and other household substances are to be stored separately from drugs**.**
- Drugs are to be stored at proper temperatures.

Temp condition	Limit
✓ Freezer	- 15 To 0 °C
✓ Refrigerator	+ 2 To + 8 °C
✓ Cool	+ 8 To + 15 °C
✓ Ambient Temperature	+ 15 To + 25 °C

- Drugs are not to be kept on hand after the expiration date which appears on the label. Outdated, contaminated, or deteriorated drugs, and those in containers which are cracked, soiled or without secure closures are to be immediately withdrawn from stock, re-ordered from the pharmacy if a current order exists for any patient, and disposed of in accordance with the procedures for drug destruction.

Self-check: Written test

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Define Zoonotic diseases (1pt)

2. List 4 zoonotic diseases (4 pts.)

3. Mention 5 Occupational hazards (5 pts.)

Choosing

1. Which of the following proper temperature storage of drugs (1pt)

A. Freezer - 15 to 0 °C

B. Refrigerator + 2 to + 8 °C

C. Cool + 8 to + 15 °C

D. all

Note: Satisfactory rating –11points Unsatisfactory - below 11points.

Information sheet 2: Monitoring health and wellbeing of animals closely

2.1. Introduction

Wellbeing is an internal state involving quality of life that is affected by responses to internal and external factors. These factors may be good or bad, positive or negative. Individuals experience wellbeing differently, because of their different needs, goals, motivations and preferences. In addition, wellbeing in one individual can vary from time to time, and changes may or may not be orderly or predictable. As a protective mechanism, departures from optimal wellbeing generally cause normal adaptive coping responses designed to return the animal to its normal state of wellbeing. Ineffective responses may result in distress, disability, disease or death.

2.2. Daily observation is key in animal health and wellbeing

Daily observation helps animal owners properly monitor their animal's health and wellbeing**.**

One of the most overlooked practices among animal owners is daily observation. Daily observation will help owners properly monitor their animal's health and wellbeing. We often get caught up in the routine of making sure our animals have feed and water and forget to examine some other equally important things that are happening in our barns**.**

- Know the signs and symptoms of a sick animal as they are key in monitoring the animal's overall health. Animal owners develop baseline knowledge for each animal and how they act and react during interactions. Mentally taking note of a few things can help you be aware of how your animal may be feeling
- Inspect the animal thoroughly daily for cuts, abrasions, rashes, fungus and external parasites. It is important to make it a daily habit to individually inspect each animal for any injuries. It is a skill that may take time to develop, but after it has become part of a routine, you will find the time it takes decreases. With tame animals, it is always helpful to have an individual interaction with them where you can run your hands over their top lines, down their legs and under their bellies. This will allow you to have a good look at the animals' body up close. During this time, you can address any issues such as an unexplained lameness, cut or abrasion.

Figure 1: Regularly inspection

It is essential to monitor daily intake of **wate**r and **feed**. Typically, an animal losing its **appetite** and becoming lethargic is the first symptom of illness and a cue for owners to contact their veterinarian. When you are aware of what the animal or herd normally consumes, this will give you clues of additional body characteristics to look for when you are inspecting the animal. For example, if you observe the water tank is not as empty as it typically is at evening or morning chore time, indicating animals aren't drinking appropriately, you can check each animal for classic signs of dehydration such as sunken sides and poor capillary refill.

Daily observation of our animals is the most important, yet most overlooked, task animal owners can do to help keep their stock healthy.

2.3. Stock-Keeping Skills

Training and the acquisition of skills that enables stock persons and animal handlers to have improved attitudes and behaviors towards animals in their care, and to enable more appropriate handling, has been shown to significantly reduce stress and improve yield .

A stock-keeper has the most significant influence on the wellbeing of cattle. Stock-keepers should be competent in a wide range of animal health and wellbeing skills, including:

- Handling skills
- Ear tagging
- Castrations
- Administering medicines
- Preventing and treating internal and external parasites
- Preventing and treating basic common causes of lameness
- Removing extra teats
- Milking

2.4. Handling Skills

Cattle should be moved at their own pace, without being hurried by stock-keepers, vehicles or dogs. They should be encouraged gently – especially around corners and where it is slippery underfoot. Excessive noise, excitement or force should be avoided. Putting undue physical pressure or striking particularly sensitive parts of the body, such as the head or udder, should be avoided. Sticks or other similar handling implements should only be used to guide animals, and these should not have a sharp or pointed end. The use of electric goads on cattle should be avoided as far as possible.

The handling of animals should foster a positive relationship between humans and animals and should be placed on pleasant, consistent and confident handling and not causing injury, panic, lasting fear or avoidable stress. There have been numerous studies showing the importance of positive human–animal relationship in reducing stress and ensuring high productivity

Fig 2: Less human contact

2.5. The Five Freedoms of Wellbeing/welfare animals

1. Freedom from hunger and thirst
2. Freedom from discomfort
3. Freedom from pain, injury and disease
4. Freedom to express normal behavior
5. Freedom from fear and distress

Self-check:	**Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is Animal Wellbeing (1 pts.)
2. Why it's important daily observation (2 pts.)
3. Mention the Five Freedoms of Wellbeing/welfare animals and explain each of them (3pts)

Note: Satisfactory rating –5 points Unsatisfactory - below 5 points.

Information Sheet 3: Identifying abnormal animal behavior and signs of illness.

3.1 Introduction

Animal behavior is the study of how animals move in their environment, how they interact socially, how they learn about their environment, and how an animal might achieve cognitive understanding of its environment.

Abnormal behavior is characterized as: – Non- typical – Socially unacceptable – Distressing to the person who exhibits it or to the people around them

3.2. Abnormal animal Behavior

- **Kicking**

Cattle can kick backward, forward and to the side with some degree of accuracy and strength. Proper precaution should be exercised, especially with cattle that are infrequently handled. Kicking can be the result of negative temperaments, cattle experiencing fear, or can be an indicator of pain. Identifying which one of these problems is causing the kicking behavior is important, as cows of poor temperament are not wanted for breeding, whereas the welfare of a cow experiencing fear or pain is compromised.

- **Changes in normal behavior** .
  - ✓ Increased defecation and urination
  - ✓ Standing with front feet in stalls and rear feet in walkways
  - ✓ Increased standing and less lying
  - ✓ Increased lying time and less frequent standing and repositioning themselves in stalls
  - ✓ Refusal to use stalls and lying in walkways or partially in stalls
  - ✓ The 'hesitation waltz' or apprehensive behavior before actually lying down in stalls. This can take several minutes, in contrast to a few seconds taken by cows at pasture. This intention time is then another measure of stall comfort.
  - ✓ Unusual actions when rising or trying to rest in stalls
  - ✓ Lapping at water rather than sucking it up
  - ✓ Reaching over the walls to drink water rather than stand in the walkway where troughs are located

- ✓ Unusual and unexpected approaches to eating or drinking
- ✓ Unusual walking actions
- ✓ Reluctance to cross gutters or enter some areas of the shed

Figure 4: Dog sitting' position.

- **Aggressive behaviors**

Cows are more prone to act aggressively in the first few hours post-partum while protecting their newborn from outside intrusion. Cows and heifers on heat or young bulls past puberty may lose their inhibitions towards humans and attempt to mount them.

- **Silent heat**

This is the failure to indicate signs of estrus even though the reproductive tract is at the height of influence by the reproductive hormones. Silent heat can be attributed to several factors, including but not limited to: cows being in estrus but outside the observation period of persons assigned the task of heat detection; movement of cows from pastures to holding yards; slippery concrete and other places of unsure footing; heavy rainfalls; cows with sore feet and lameness; and group dynamics – submissive cows may avoid mounting dominant cows in oestrus. Detection of heat can also be more challenging with tethered animals

- **Nymphomania**

Nymphomania is linked to a follicular cystic disease of the ovary in cattle. It has a higher incidence in dairy than in beef cattle, probably due to their more intensive housing and management. It appears to have a genetic basis and can be in 5 to 25% of the cows in problem herds

- **Restlessness**

It is a more severe state in which movement is almost constant, consisting of lying down, rolling, getting up again, looking at the flanks, kicking at the belly and groaning or bellowing. This form of behavior is usually caused by sharp intermittent or constant pain, as in colic syndrome in horse

- **Mania**

In mania the behaviour aberrations appear to compulsive and include vigorous licking of some specific parts of the body surface (ketosis, pseudo rabies). Pressing forwards with the head (meningitis) or licking or chewing inanimate objects.

- **Posture**

It denotes the anatomical configuration when the animals remain in stationary situation. How does it stand? How does it sit? How does it lie?

Examples that indicate abnormalities of posture

- ✓ **Kyphosis –** it is dorsal bending of the spinal column**.**
- ✓ **Lordosis –** it is ventral bending of the spinal column.
- ✓ **Dog-sitting-position** in acute gastro-distension in the horse, pain and pressure on the diaphragm cause the animal to adopt the "dog-sitting-position**".**

- **Walking in circle** – coenuruses otitis (dog and cat)
- **Mismothering**

This may be due to the mother having suffered a long and difficult birth and not being able to stand up for suckling. The calf may also be too weak to suckle. Cases of mis-mothering are common with cows calving in synchrony in intensively managed maternity groups

- **Wood chewing**

A common habit that horses develop to ease their boredom and frustration is chewing on their wood stalls or other wood in their enclosures. There are some medical issues, such as vitamin deficiencies, that may compel a horse to chew wood. But most of the time a horse that's chewing on wood is a bored horse.

Fig 3: Wood chewing

- **Illness/disease**.

Cattle that are not healthy will show abnormal behavior. Healthy cattle will appear alert, stretch on rising and be vocal – they often vocalize in response to pain or stress. Unwell cattle often show little interest in their environment, have dull eyes, sluggish movement, poor grooming and poor appetite. Other indicators of sickness include over-stretching of the neck, hunching the back, kicking the belly area (indicating abdominal pain), grinding teeth, star-gazing, etc.

3.3. Signs of illness or injury of animals

3.3.1. How to Identify Sick Animals

There a number of signs that one would see to determine if an animal is healthy, sick or suffering from certain ailments. A good farmer on seeing these signs takes proactive measures to rescue the animals from further harm by giving medications. Below are 10 signs to determine if an animal is healthy or is ill.

These signs of good health and ill health in farm animals are as follows.

- **Appearance and behavior:** Healthy animals exhibit normal posture. They are alert; having clear eyes and responds well to a touch. Any abnormal running nose and dull eyes may indicate ill health.
- **Movement:** Any animal that cannot walk or stand properly must be closely watched since something might be wrong with it. When you notice that the animal is walking and favoring on the leg, it would be advisable to you restrain that animal and find out what is causing it to do so.

- **Appetite and feeding:** Healthy animals have a good appetite for feed and generally like to feed to their satisfaction. Sick animals have no appetite for food. When you notice that your animal suddenly lose appetite for food, you shouldn't take it as normal because it may be a sign of it beginning to fall ill.
- **Urine:** The normal color of urine is pale yellow. Much deviation like deep yellow, blood-stained or cloudy urine shows ill health. When your animal finds urination painful, it shows that there is something wrong with its urinal system and any other color apart from pale yellow is a sign of ill health.
- **Coughing:** When an animal coughs continuously, it shows that something is irritating its throat and you need to find out why that keeps happening. Coughing is a good sign of good health but it shouldn't be a continuous cough.
- **Pain:** Healthy animals do not show any sign of pain but when animals begin to show signs of pain by grinding of teeth or groaning, it is an indication that something is wrong and such animal needs to be examined immediately.
- **Faces and defecation:** Any deviation of the faeces i.e. too hard, too watery or stained with blood, or contaminated with worm segments, is an indication of ill health. When you see that your animal begins to defecate on its body it is an indication that it has a problem in its alimentary canal and immediate attention needs to be given to the animal**.**
- **Skin and coat:** The coat of healthy animals should be clean, smooth and shiny and show complete cover. Signs of ill health are; the coat looks dull and hairs fall out.

Cold, dry and scary skin signifies diseases. When you see your animal suddenly show symptoms of skin disorder, immediate attention should be given to the animal because if that is not done, the hide's value of the animal will reduce.

- **Temperature, pulse rate and respiratory rate:** Every animal has a specific range of body temperature, pulse rate and respiratory rate that determines healthy condition. Radical deviation from these values signifies ill health. You will have to check your farm animal to ensure that it is physically, mentally and psychologically fit. Any deviations in these shows that your animal is ill.

- **Mucous membrane:** These are the lining of various system and organs of the body, e.g. eyes, nose, anus etc. The mucous lining of healthy animals is moist. When all these places become dry the animal experiences discomfort and when noticed immediate attention should be given to the animal before it becomes very severe**.**
- **Changes in posture**
  - ✓ Curved back
  - ✓ Limb elevation
  - ✓ Tucked abdomen
  - ✓ Unusual head posture
  - ✓ Bent posture
- **Changes in movement**
  - ✓ Lameness, limping
  - ✓ Difficulties in getting up
  - ✓ Reduced movement and activity
  - ✓ Stiff gait.
- **Changes in eating and drinking behavior**
  - ✓ Reduced appetite
  - ✓ Refusal to eat and/or drink
- **Changes in appearance**
  - ✓ Changed shine of the eyes
  - ✓ Changed facial
  - ✓ expressions
  - ✓ Dilated pupils.
  - ✓ Dull, unkempt fur
  - ✓ Emaciation
  - ✓ Dehydration

Self-check:	**Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Differentiate sick and Ill animals (2pts)
2. List common sign of sick animal (2pts)
3. List some common contagious diseases(2pts)

Note: Satisfactory rating –6 points Unsatisfactory - below 6 points.

Information Sheet 4: Identifying and planning treatment options for broad categories of diseases

4.1. Introduction

The key to success in handling animal disease epidemics is **early detection**. If a disease can be detected very early in the phase of epidemic development, the possibility exists that it can be arrested and eliminated before it actually inflicts damage. Early detection presupposes that there is a diagnosis system in place that will bring infection to light when it is first seen.

The presence of disease is revealed by certain changes in the structure of an organ or tissue and or its function, as well as in the behaviour of the whole living organism. Such changes, which may be quantitative, qualitative or both, are described as the clinical signs of disease, and the process of deducing from them the nature of the disease that is present is described as **making diagnosis**.

4.2. Diagnosis: is the act of discovering or identifying the exact cause of an illness or problem. The **diagnosis** is based on accurate history, careful examination of animal, collection of material for lab examination and correlation and interpretation of findings.

Dia=Thorough **Gnosis**= knowledge

The diagnosis is based on accurate history, careful examination of animal, collection of material for lab examination and correlation and interpretation of findings.

4.2.1. Types of diagnosis

Based on the degree of certainty of the diagnosis and methods used to examine the animal diagnosis can be categorized as:

- Symptomatic diagnosis
- Tentative diagnosis
- Confirmatory diagnosis
- Differential diagnosis
- Test therapy diagnosis

4.2.3. Procedures in diagnosis of animal diseases

1. Restraining of animals

1.1. Methods of Restraining

- Physical restraining method
- Chemical restraining and
- Verbal restraining method

2. History Taking (Anamnesis)

2.1. Conditions to be considered at history taking:

- The words or expressions that are used should be understandable to the client
- Allowance to the knowledge and ability (skill) of the owner should be made
- The clinician should check the validity of history by detailed examination
- Leading questions should be avoided
- The clinician should exhibit friendly manner with the owner to keep him confident

2.2. History taking includes:

1. **Immediate history**

- **Duration of illness**
  - ✓ **Per- acute disease**: Ranging from few hrs to two hrs.
  - ✓ **Acute disease**: Ranging from 3hrs to 14 days.
  - ✓ **Sub-acute disease:** Ranging from 2weeks to 4 weeks.
  - ✓ **Chronic disease**: if the course of disease is greater than 4 weeks.
- **Nature of disease occurrence**
  - ✓ **Sporadic disease**: diseases that affect only few animals in the population and show no tendency to spread (irregular occurrence of disease)
  - ✓ **Epidemic disease**: when the animal is attacked in large number at the same time and the disease spread with considerable rapidity.
  - ✓ **Endemic disease:** when diseases are retained in some locality for long period of time affecting a large number of animals.

2. past medical history

3. Information about the environment.

2.3. Clinical examination of the patient

2.3.1. Physical examination methods for detection of clinical signs

A clinical examination is performed by senses of sight, touch, hearing and smell. The physical examination methods include:

- Inspection
- Palpation
- Percussion .
- Auscultation

7.2. Inspection (visual examination)

It is done with the aid of eyes to obtain a general impression. It is carried out some distance away from the animal and in close by.

7.3. Palpation: Touching the part to be examined by the hand to detect the presence of pain, variation in size, shape, consistency & to feel the temperature.

Terms Used to define palpation

A. Resilient- when a structure quickly resumes its normal shape after the application of pressure has ceased.

B. Doughy - when pressure causes pitting as in oedema.

C. Firm - when resistance to pressure is similar to that of the normal liver

D. Hard- when the structure possesses bone like consistency.

E. Fluctuating - when a wave-like movement is produced in a structure by application of alternating pressure.

F. Emphysematous - When the swollen structure yields crepitating or crackling sound on pressure.

7.4. Percussion: It is done by means of striking a part of the body and listening to the sound generated , to obtain information about the conditions of the surrounding tissues (particularly the deeper lying organs) i.e is it a normal percussion sound or not? Percussion is used mainly for the examination **of the thorax (lungs, heart).**

7.4.1. Methods of Percussion

- **Hammer- Flexi meter Percussion**:

This is a method of carrying out percussion in large animals using a Flexi meter & hammer.

- **Finger – finger percussion**:

This type of percussion is performed by using hands, the middle finger of one hand acting as a flexi meter & the flexed middle finger of other hand as a hammer. It is mainly applied in small animals.

The diagnostic value of percussion in large animals is rather limited because the internal organs are too large, and the over lying tissues (muscles, subcutaneous fat) are too thick to recognize the limits of the organs or abnormal areas, unless the clinician is highly experienced.

7.4.2. Modified Forms of Percussion

- **Ballottement:** A method of diagnosing pregnancy, in which the uterus is pushed with a finger to feel whether a foetus moves away and returns again.
- **Fluid percussion:** Free fluid in a body cavity to be recognized by percussing the surface of the body on one side, and detecting the fluid wave produced by palpation of the opposite side.

7.4.3. Sounds Produced By Percussion

- **Resonant**- it is characteristic of sound emitted by air containing organs, such as the lungs.
- **Tympanic**: it is the sound produced by striking a hollow organ containing air under pressure, e.g. tympanic rumen.
- **Dull**- it is the sound emitted by a solid organ like the liver or heart.

7.4.4. Auscultation

Auscultation is determining the physical condition of deep- lying organs, such as heart, lungs, and gastro intestinal tract, through the sense of hearing and with the aid of the stethoscope.

7.4.1. Methods of Auscultation

- **Direct method**- it is performed by placing the ear in contact with the body surface over the organ to be examined.
- **Indirect method**- employing a suitable stethoscope is the more preferable and with adequate experience will ensure more uniform results than the direct method

7.5. Taking physical body parameters

The temperature of the body of different animals varies widely. The temperature of the body surface is usually less than the temperature of the deeper parts. During the process of examination of mucous membrane, skin and mouth, the clinician may appreciate the rise or fall of body temperature, but the exact temperature has to be recorded with the help of a clinical thermometer.

7.5.1. Site of Temperature Taking

The temperature in domestic animals is recorded in the **rectum**. In female animals, the vaginal temperature may also be considered but it should be borne in mind that vaginal temperature may remain high during oestrus. Vaginal temperature is 0.5 degree centigrade higher than the rectal temperature of healthy animal.

7.5.2. Procedures of Temperature Taking

1. The thermometer should be sterilized by disinfectant (antiseptics) before use;
2. It should be well shaken before recording of temperature to bring the mercury column down below the lowest point likely to be observed in different species of animals.
3. The bulb end of the thermometer should be lubricated with liquid paraffin or glycerine or soap especially in case of small pup and kitten.
4. Care should be taken so that the bulb of the thermometer remains in contact with the rectal mucous membrane.
5. The thermometer should be kept in site for at least 3-5 minutes.
6. Read the thermometer.

Table 1: Normal Rectal Temperatures of various spp of animals

Animal	Range	Average

Adult draught	37.2-38.0	37.6
Foal	37.5-38.6	38.0
Cattle	37.8-39.2	38.5
Calf	38.6-39.8	39.2
Sheep	38.9-40.0	39.5
Goat	38.6-40.2	39.4
Pig, adult	37.8-38.9	38.3
Piglet	38.9-40.0	39.4
Chicken/fowl		40.8
Camel	35.0-38.6	37.8
Dog	37.9-39.9	38.9

7.5.3 Factors which influence the change of body temperature

- **Exercise** - temperature at Exercise>at rest
- **Environmental** temperature and humidity and ventilation
- **Age**, size and species - in smaller animals >larger; younger animals >older
- **Sex** - Female>male; pregnant>non-pregnant
- Sweating, feeding etc.

7. 6. Pulse rate taking

- **Pulse:** is the regular expansion and contraction of an artery, caused by the heart pumping blood through the body.
- **Pulse rate** is the number of contraction and expansion of arteries per minute.

The **techniques of taking** the pulse consists of placing the ball part of one or more fingers on the skin over the selected artery and applying gentle pressure until the pulse wave can be detected.

7.6.1. Sites of pulse taking:

- **Horses**

- ✓ Facial artery
- ✓ Curves around the lower border of the mandible.
- ✓ Median artery.

- **Cattle**
  - ✓ Middle coccygeal artery, under the tail 1or 2 hand breaths from the base of the tail
  - ✓ Facial on the lateral aspect of the mandible is also used.
- **Sheep and goat:** Femoral artery
- **Adult swine:** Femoral artery, Middle coccygeal artery etc.
- **Cat and dog:** Femoral artery

When determining the pulse rate, a watch with a second hand should be used, and the waves counted for a minimum of 30 seconds, where the number obtained should be multiplied by 2.

7.6.2. Physiological factors affecting the pulse rate in normal animals:

- **Species:** in general, the smaller the species, the more frequent the pulse rate is.
- **Size**: within species the pulse rate is usually higher in larger individuals
- **Age**: The pulse rate in very young animals is much higher than in adolescent and adult individuals of the same species.
- **Physical condition:** athletic animals have a less frequent pulse than non-athletic animals of the same species and type.
- **Sex**: in most species male animals has a slightly lower pulse rate than females.
- **Pregnancy**: pregnant animals have more frequent pulse than non-pregnant ones.
- **Exercise**: it increases the pulse rate to an extent that varies according to the severity of the exercise and fitness of the animal.
- **Ingestion of food**: Eating a large quantity of food will cause a very considerable increase in the frequency of the pulse.
- **Environmental temperature**—exposure to either very high or very low temperature produces an increase in the rate of pulse.

Table 2: Normal pulse rate (beats/minute)

Animal	Range	Animal	Range

Horse	28-40	Cat	110-130
Cattle	55-80	Rabbit	120-250
Calf	100-120	Chicken	250-300
Sheep/goat	70-90	Chick	350-450
Pig (adult)	60-90	Camel	25-32
Dog (large)	65-90	Ass	40-56
Dog (small)	90-120	Elephant	22-53

7.7. Taking Respiration Rate

- **Respiration:** The act of breathing air in and out.
- **Respiratory rate:** Refers to the number of breathes per minute.

7.7.1. Examination of the Lungs and Respiration

The lungs are located in the triangle formed by the points on the external angle of scapula, the 2nd from the last intercostal space and olecranun process.

- **Physical examination of the lung area**
  - ✓ Inspection
  - ✓ Palpation
  - ✓ Percussion
  - ✓ Auscultation of the lung.

Table 3: Normal respiration rates (breathes/minute)

Animal	Range	Animal	Range
Horse	10-14	Dog	15-30
Ox (adult)	10-30	Cat	20-30
Ox (yearling)	15-40	Rabbit	90-100
Sheep/goat	15-30	Cock	12-20
Pig	8-20	Hen	20-36

8. Identifying Categories of diseases

8.1. Basic Terminologies

- **Disease**s: defined as an alteration of the state of the body, or of some of its organs, which interrupts the proper performance of the body functions.
- **Infectious disease** is one that is caused by the presence in or on an animal body of a foreign living organism, which creates a disturbance leading to the development of signs of illness.
- **Non-infectious disease:** It is a disease, which is caused by non-living agents or factors like injury, plant or animal poison, cold, excessive heat or faulty nutrition,
- **Contagious disease:** Contagious disease is that is caused by an organism, which is readily transmitted, from one individual to another by direct or indirect contact.
- **Infection**: Invasion of pathogenic microorganisms into body tissues so that the tissues are affected and altered.
- **In-apparent (Silent) infection**: This is infection of a susceptible host without showing clinical signs.
- **Sub-clinical Infection**: This is also infection of a host without overt clinical signs..
- **Clinical Infection**: - This type of infection produces clinical sign or disease.
- **Virulence**: is the ability of an infectious agent to cause disease, in a particular host, in terms of severity.

- **Carrier State:** In a broad sense, a carrier is any animal that sheds an infectious agent without demonstrating clinical signs**. Carriers can be.**
  - ✓ Incubatory Carriers
  - ✓ Convalescent Carriers

8.2. Category of animal diseases

A. Diseases caused by bacteria

1. Anthrax

Synonyms: Splenic fever; Wool sorter's disease

Anthrax is a widespread infectious disease of livestock that occurs throughout the globe. It is a per-acute disease characterized by sudden death with the exudation of tarry blood from the natural body orifices of cadaver. Anthrax is a zoonotic disease

2. Blackleg

Synonyms: Black quarter; symptomatic Anthrax

Blackleg is an acute infectious but not contagious disease of cattle, goat and sheep and characterized by inflammation of the muscles, severe toxaemia and high mortality.

3. Tetanus

Synonym: Lock jaw

It is a highly fatal, non-contagious, non-febrile infectious disease of mammals caused by toxin and characterized by spasmodic contraction of skeletal muscles.

4. Botulism

Botulism is a rapidly fatal motor paralysis caused by ingestion of preformed toxin of *Clostridium botulinum.*

5. Malignant Oedema

Synonyms: gas gangrene

It is an acute wound infection and characterized by toxaemia, fever, oedematous and emphysematous swelling around the wound.

6. Bacillary haemoglobinurea

Synonym: Red water disease

This is acute, highly fatal toxaemia of cattle and sheep and characterized clinically by high fever, hemoglobinurea and jaundice and the presence of necrotic infarcts in the liver.

7. Pneumonic pasteurellosis

Synonyms: Shipping fever pneumonia

It is associated with infection by *pasteurellahemolytica* and occasionally *pasteurellamultocida*. It is characterized clinically by acute bronchopneumonia with toxaemia.

8. Septicaemia pasteurellosis

Synonym: haemorrhagic septicaemia

The disease is an acute septicaemia caused by *pasteurellamultocida.*

it occurs in an outbreak during periods of environmental stress, the causative organism in the intervening periods persisting on the tonsilar and nasopharyngeal mucosa of carrier animals.

9. Tuberculosis

Synonyms: Great white plague, Pearl disease, Scrofula

It is a chronic contagious disease of man and animals caused by certain pathogenic organisms of the genus *Mycobacterium*, characterized by development of tubercles with calcification in any of the organs it is a highly infectious bacterial zoonotic disease.

10. Colibacillosis

Synonyms: Calf scour, white diarrhoea

Colibacillosis is one of the diseases of new borne animals (calves, piglets, lambs and foals) caused by *Escherichia coli* and characterized by marked prostrations, profuse diarrhoea and septicaemia.

11. Salmonellosis

It is an acute or chronic contagious disease of all species of animals and human being characterized by gastro-enteritis high morbidity and heavy mortality.

12. Brucellosis

Synonyms: Bang's disease

Brucellosis is an acute or chronic contagious disease of domestic animals that causes placentitis and abortion. It is occupational disease in human being and may be acquired from animals.

12. Mastitis

The term mastitis refers to inflammation of the mammary gland regardless of the cause. It is characterized by physical, chemical and usually bacteriological changes in the milk and by pathological changes in the glandular tissue. The most important changes in the milk include discoloration, the presence of clots and the presence of large numbers of leukocytes.

13. Infectious Coryza

This is a bacterial disease caused by Avibacterium paragallinarum, (in the past known as Haemophilus paragallinarum). There are 3 common serotypes, representing different immunotypes: A, B, C.

14. Mycoplasma Synoviae

Mycoplasma synoviae (MS) infection most frequently occurs as subclinical upper respiratory tract infection inducing air sac lesions. After MS becomes systemic it can induce acute to chronic infection of synovial membranes of joints and tendons resulting in synovitis, tendovaginitis or bursitis. Recently MS was isolated from laying flocks with drop in egg production and/or misshapen eggs (so called “glass window eggs”).

B. Diseases caused by virus.

1. **Rinderpest (Cattle plague**)

Rinder pest, the severest infection of cattle, is characterized by fever, necrotic stomatitis and gastroenteritis, lymphoid necrosis, and high mortality.

All cloven-hoofed animals are susceptible, but there is a wide range of species susceptibility.

2. Peste des petitis ruminants (PPR)

Synonym: Goat plague

It is an acute or sub acute viral disease of goat and sheep that characterised by fever, gastroenteritis, necrotic stomatitis, and pneumonia.

3. Malignant Catarrhal Fever (**Bovine Malignant Catarrha)**

It is an acute highly fatal disease of cattle characterized by development of an erosive stomatites and gastroenteritis and erosions in the upper respiratory tract, keratoconjunctivitis, encephalitis, and lymph node enlargement.

4. African horse sickness

It is a highly fatal, infectious disease of horses, mules and donkeys

5. Sheep pox and goat pox

It is viral infectious disease sheep and goat characterized by fever and generalized pox lesion on the skin.

6. **Contagious ectyma**

Synonyms*:* contagious pustiular dermatitis, orf

It is a poxvirus disease of sheep and goat that are transmissible to man.

caused by virus belonging to family *pox viridae*. The virus is quiet resistance to many environmental conditions and persists year to year in contaminated premises

7. Lumpy skin disease

It is a highly infectious skin disease of cattle that characterized by sudden appearance of nodules on all parts of the skin. Different African Countries such as South Africa, Kenya, Sudan, Chad, Niger, Central Africa and Ethiopia are now known to suffer from the disease.

8. Rabies

Synonyms*:* lyssa; madness

This is an acute viral infection in man and other warm-blooded animals characterized by signs of abnormal behaviour, nervous disturbance (such as increased excitability and irritability), and impairment of consciousness, ascending paralysis and death.

9. Rift valley fever (RVF)

It is an acute, febrile disease of cattle, sheep and man characterized by hepatitis and high mortality in lambs and calves, in adult sheep and in cattle abortion and in man influenza like disease.

10. Foot and mouth disease (FMD)

Synonym: Aphthous fever

It is an extremely contagious acute disease of all cloven-footed animals that characterized by fever and vesicular eruption in the epithelium of buccal cavity, tongue, muzzle, feet, teat and udder. Caused by *picorna virus* group (genus *Aphtho virus*). At least 7 immunologically distinct serotypes of the virus have been identified. These are A, O, C, SAT-1, SAT-2, SAT-3 and Asia-1. The virus is resistant to various external agents including common disinfectant. NaoH, formalin (1-2%), Na_2Co_3 (4%) have ability to destroy the virus within few minutes.

11. Avian Influenza (AI)

Avian Influenza is caused by an Orthomyxovirus; there are several serotypes.

Currently we know there are 16 H- types and 9 N-types and they can show up in all kinds of combinations. For poultry the most important ones are H5, H7 and H9. Pathogenicity varies with the strains HPAI and LPAI (high or low pathogenic AI).

12. Infectious Bronchitis (IB)

Infectious Bronchitis(IB) is present worldwide, it is a highly contagious, acute, and economically important disease. IB is caused by an Avian Coronavirus. In the field, several different IB serotypes have been identified including the classic Massachusetts type and a number of variants such as IB 4/91, QX, Arkansas and Connecticut.

13. Infectious Laryngotracheitis (ILT)

ILT is caused by a Herpesvirus, only one serotype is known.

14. Mycoplasma gallicepticum(CRD)

The underlying cause of CRD is Mycoplasma gallisepticum (MG). The condition is frequently triggered by respiratory viruses such as ND and IB and subsequently complicated by bacterial invasion. The main agents involved in the infection are Mycoplasma gallisepticum and E. coli. Stress caused by moving the birds, by debeaking, other operations/ handlings or other unfavorable conditions e.g. cold or bad ventilation, make the birds more susceptible.

15. Newcastle Disease (ND)

Newcastle disease is caused by a Paramyxovirus (APMV-1). Only one serotype of ND is known. ND virus has mild strains (lentogenic), medium strength strains (mesogenic), and virulent strains (velogenic). The strains used for live vaccines are mainly lentogenic.

15. Marek's Disease (MD, Neurolymphomatosis)

Marek's disease is caused by a alphaherpesvirus. The disease is highly contagious. Main transmission is by infected premises, where day-old chicks will become infected by the oral and respiratory routes. Dander from feather follicles of MD-infected chickens can remain infectious for more than a year. Young chicks are particularly susceptible to horizontal transmission. Susceptibility decreases rapidly after the first few days of age.

C. Disease caused by parasites

1. Internal parasites

1.1. Lung worm (dictyocaulus)

Lung worms are widely distributed in the world, but are common in the highland of tropical and subtropical countries

Lungworm disease is caused by

- Dictyocaulus viviparous in cattle and buffalos
- Dictyocaulus filarial in sheep and goats

Susceptible cattle, sheep, goats, horse, mules and donkeys

Transmission pasture contaminated with faeces

1.2. Liver fluke (fasciollosis)

Is leaf shaped it occurs in the liver of a large number of ruminants

Liver fluke disease is caused by

- Fascila hepatica
- Fasciola gigantica

Susceptible cattle, buffaloes, camels, horse, mules, donkeys, sheep, goats, pigs and rabbits

1.3. Trichurs

Most gastro intestinal parasites live within the intestinal tracts. Are found in the large intestine of cattle, there is little information on the distribution and incidence of the ruminant trichuris

1.4. Strongyles this is probably the most common intestinal parasite of young cattle

Species of parasites

- Strongyloideswestri affect horses and donkeys
- Strongyloidespapillosus affect ruminants
- Strongyloidesransomi affect pigs
- Strongyloidesstecorals affect dog and cats
- Strongyloidesavium affect poultry

1.5. Rumen flukes

A large amount of rumen fluke larvae can sometimes cause diarrhea and un thriftiness in young animals. Normally, however, the presence of rumen flukes causes no signs of disease in cattle.

1.6. Tapeworms (Taenia Saginata)

The adult tapeworm lives in the intestines of people. However, before eggs can develop into adult worms they have to pass through cattle as part of their life cycle**.**

Segments from the tapeworms are passed out with the human faeces to the environment. If the segments are placed in an area where cattle graze or drink, they may be taken up by the animals.

In cattle they will develop into bladders (called cysts) in the muscles. When meat containing cysts is eaten by human beings, the cysts develop into worms in the intestine.

1.7. Coccidiosis

The condition is very commonly observed, especially in young growing calves, in several buffalo raising countries. The confinement of animals to dirty places will increase the intensity of the disease. Riverine buffalo suffer more from the disease. The characteristic symptoms are enteritis with liquid faces mixed with blood.

1.8. Roundworms

There are many drugs which can be used against roundworms. Drugs which are given through the mouth and by injection are available. All animals in the herd should be treated. In order to avoid disease, treatment against worms should be given at regular intervals. Some other precautions can be taken by the farmer to avoid disease or make the parasite burden less serious:

- If possible pastures should be rotated
- Animals with severe signs of disease should be isolated from the rest of the herd
- Animals should not be fed from the ground
- Overstocking should be avoided.

2. Disease caused by external

2.1. Ticks: are external parasites that live attached to outer surface of their hosts and cause skin problems and they spread many disease of animals

It is easy to see ticks on animals. Common places to find ticks are on the head, ears, the base of the tail, the udder and the dewlap. Several hundred ticks on one animal is not uncommon, but sometimes only a few are present.

Ticks can cause different kinds of disease in animals:

- Tick-borne diseases.
- Loss of condition
- Anaemia
- Inflammation and damage to the skin.

Species of ticks

- Amblyommavariegatum transmit heart water in cattle
- Boophylusannulatus transmit babesia
- Boophylusdecoloratus transmit babesia
- Rhipicephalusappendiculatus transmit east coast fever of cattle, babesia and nairobe sheep disease

2.2. Lice are insects with no wings that live on the skin of animal, birds and people. They look like small black dot on the skin and you can see their grey eggs attached to hair or feathers

Type of lice

- **Biting lice** feed on hair and on the surface of the skin
- **Sucking lice** bite through the skin to feed off body fluids [Blood suckers]

  A few animals with many lice have pale mucous membranes

2.3. Mange all animals and birds get mange it is transmitted by contact with infected animals

Type of mange

- Psoroptic mange commences at the root of the tail or on the neck gradually extended over the back, head, legs and finally affect the all body of the animals
- Sarcoptic mange affect head and neck
- Chorioptic mange affect the region at the root of the tail
- Demodex mange affect neck, head and shoulder

2.4. Fleas have no wings and move around by jumping. They are not often a problem for dogs, rabbits and birds and sometime get on to other animals and people, they bite through an animal's skin to suck blood

2.5. Flies many different flies cause problems on the skin and spread disease when they bite animals

Type of flies

- **Black flies** are small flies often many flies bite an animal at same time to feed on blood. They spread worms that cause skin modulus
- **Blow flies** blue/green or yellow/red. They cause wound on the skin animal
- **Camel flies** have small wings and do not fly. Camel flies do not cause serious problems, but they suck blood and can cause anaemia
- **Horse flies** they bite horses, cattle and people. They cause pain and bleeding when they bite and they spread disease

D. Fungus

A fungus (plural: fungi or funguses) is any member of the group of eukaryotic organisms that includes microorganisms such as yeasts and molds, as well as the more familiar mushrooms.

Fungi are among the most widely distributed organisms on Earth and are of great environmental and medical importance. Many fungi are free-living in soil or water; others form parasitic or symbiotic relationships with plants or animals.

1. Aspergillosis

Aspergillos is in animal's covers a wide range of diseases from localized conditions to fatal disseminated infections, as well as allergic reactions caused by fungi belonging to the genus Aspergillus.

In animals, aspergillosis is primarily a respiratory infection that may become generalized; however, tissue predilection is variable between species. Similar to infections in humans, animals exhibiting inability to produce a normal immune response are at higher risk of infection. Aspergillosis may also occur in healthy animals under environmental stress and other immune-compromising conditions.

2. Mucormycosis

Mucormycosis is a saprobic opportunistic infection caused by fungi in the order Mucorales in the former class Zygomycetes. Within the order, the most often identified species belong to the genera Rhizopus, Mucor, Rhizomucor, Lichtheimia(formerly Absidia), Apophysomyces, Cunninghamella, and Saksenaea. The natural habitat for the Mucorales is soil, and they are typically isolated from decaying organic material. The fungi are often also found in indoor and outdoor air, in food stuffs, and in dust. Mucormycosis in animals (both domesticized and wild, and in mammalian and non-mammalian) and humans are similar with respect to epidemiology, portal of entry, localization, and formation of lesions

3. Candidiasis

The genus Candida is currently being reclassified along phylogenetic lines. In its classical sense, it comprises over 200 species of which 15 have been isolated from infections in humans and animals. Most prominent as causes of disease are C. albicans, C. glabrata,

C. parapsilosis, C. tropicalis, and C. krusei. These species are also frequently found as part of the microbiota of healthy humans and animals and are thus considered as commensal and facultatively pathogenic. While C. albicansand C. glabrata appear to occur only in association with warm-blooded hosts, other infectious Candida species are also known from the environment.

4. **Cryptococcosis**

The genus Cryptococcus comprises basidiomycetous yeast species, most of which are environmental saprophytes that do not cause infections in human or animal. Diseases caused by other Cryptococcus species, such as Cryptococcus

laurentii and Cryptococcus albidus, have been reported infrequently and generally in immunocompromised hosts.

5. Coccidioidomycosis

There are two distinct cryptic species within the genus Coccidioides (Ascomycota, Pezizomycotina, Eurotiomycetes, Onygenales, Onygenaceae): Coccidioides immitisand C. posadasii. Both species are dimorphic fungi with an environmental saprotrophic phase and a host-associated parasitic phase. By definition, dimorphic fungi are defined by their temperature-dependent transition from a saprophytic mold to a parasitic yeast form upon transition into a mammalian host.

6. Histoplasmosis

Histoplasma capsulatum is a dimorphic fungus widely distributed in the tropical or subtropical areas of the world and infects numerous mammalian hosts. The population of H. capsulatum includes three distinct subspecies determined by geographical distribution and clinical signs. Histoplasma capsulatum var. capsulatum has a global distribution, causing pulmonary and systemic infections in a diversity of mammals, including humans.

7. Blastomycosis

Blastomycosis is a serious fungal disease of dogs, humans, and occasionally other mammals such as cats and horses caused by geographically restricted, thermally dimorphic fungus Blastomyces dermatitidis. Blastomycosis is mainly common in dogs

residing in or visiting enzootic areas. The incidence of blastomycosis in dogs is 8–10 times that of humans, presumably related to time spent outdoors, proximity to soil, and activities, such as digging, that may result in soil disturbances and increase conidial exposure. Most affected dogs are immunocompetent.

8. Mycotoxins and mycotoxicoses

Mycotoxins are defined as the chemicals of fungal origin being toxic for (warm-blooded) vertebrates. Mycotoxins are secondary metabolites produced during consecutive enzyme reactions via several biochemically simple intermediary products from the primary metabolism of acetates, mevalonates, malonite, and some amino acids.

9. Chrysosporium

Is a genus of hyaline hyphomycetes fungi in the family Onygenaceae. Chrysosporium colonies are moderately fast-growing, flat, and white to tan to beige in color; they often have a powdery or granular surface texture.

10: Dermatophytes are a common label for a group of fungus of Arthrodermataceae that commonly causes skin disease in animals and humans. Dermatophytes cause infections of the skin, hair, and nails, obtaining nutrients from keratinized material.

11: Epizootic lymphangitis is a contagious lymphangitis disease of horses and mules caused by the fungus Histoplasma farciminosum.[1] Cattle are also susceptible, but more resistant to the disease than equids.

12: Histoplasmosis is a fungal infection caused by Histoplasma capsulatum. Symptoms of this infection vary greatly, but the disease affects primarily the lungs. Occasionally, other organs are affected; called disseminated histoplasmosis, it can be fatal if left untreated. Histoplasma capsulatum is found in soil, often associated with decaying bat guano or bird droppings. Disruption of soil from excavation or construction can release infectious elements that are inhaled and settle into the lung.

E. Rickettsial Infections

Rickettsial infections and related infections (such as anaplasmosis, ehrlichiosis, and Q fever) are caused by an unusual type of bacteria that can live only inside the cells of another organism. Most of these infections are spread through ticks, mites, fleas, or lice.

2. Epidemic Typhus

Epidemic typhus is a rickettsial disease that is caused by *Rickettsia prowazekii* and spread by body lice. People with epidemic typhus have a fever, an intense headache, Epidemic typhus is treated with an antibiotic.

3. Q –Fever is related to rickettsial diseases and is caused by *Coxiella burnetii*, which live mainly in sheep, cattle, and goats. Some people have mild symptoms, but most have flu-like symptoms, such as a fever, a severe headache, chills, a dry cough, extreme weakness, and muscle aches.

Q fever occurs worldwide. The bacteria that cause Q fever live mainly in sheep, cattle, and goats. Infected animals shed the bacteria in their milk, urine, and stool (feces). People are infected when they inhale airborne droplets containing the bacteria or consume contaminated raw (unpasteurized) milk.

9. Administer animal treatments

9.1. Drug Dosage Forms

- **Oral dosage forms: -**refers to administration of drug through the mouth. Although some oral solutions or suspensions are commercially available, the most commonly used preparations are solid oral dosage forms such as

Boluses: are large compressed tablets, used for horses & cattle provide large doses.

Capsules: is cylindrical shell made of gelatine & glycerine & suitable for drugs in powder forms & certain liquid drugs.

Syrups: are concentrated solutions of sugar in water or other aqueous liquids with a medicinal agent added.

Powders: are medicinal preparations consisting a mixture of two or more drugs in the form of fine particle for oral or topical use.

Solution: are liquid preparations with one or more drugs usually dissolved in water.

Pastes: are absorptive powders placed in a gelatinous base, used to adhere to the skin& thereby act as “spongy” to absorb exudates& moisture, also as a physical barrier to protect the skin.

Granules: are small solid pills, whose active ingredient is greater than that of powder in size.

- **Parental dosage forms**: the most common parental dosage forms are stable aqueous solutions &subcutaneous implants. The active component of stable aqueous solutions may be dissolved in an inert vegetable oil, which delays absorption. E.g. Procaine penicillin-G, Amoxicillin trihydrate, Oxytetracycillin.

- **External dosage forms:**
  - ✓ **Ointment**- semisolid preparation for external application.
  - ✓ **Cream**- a viscous semisolid, consisting of oil in water emulsion or water in oil emulsion. Dusting powder e. g. popular antibacterial agent applied on animal wounds.
  - ✓ **Lotion**- an aqueous solution or suspension for local application.
  - ✓ **Spray**-a drug applied in liquid form by pressure.
- **Inhalation dosage forms**: gaseous & volatile liquid anaesthetic agent (drugs), given by inhalation. E. g. Halothane

9.2. Routs of Drug Administration

- **Oral administration:**

There are large numbers of pharmaceutical preparations available for oral administration. Solid dosage forms (powders, tablet, capsules, pills etc) and liquid dosage forms (syrups, emulsion, mixture, drench, electrolytes etc)

- **Parenteral administration** The most frequently used are IV, IM, SC; common but less frequently used routes include eqidural, intratracheal, intraperitonial.

IV route used for rapid response and aqueous solution is preferable. Irritating and non-isotonic solutions should be injected slowly and carefully.

- **Intramuscular (IM) route**: It is used for relatively irritant drugs, or for administration of depot preparation, for aqueous or oleaginous suspensions. Absorption occurs either haematogenous or via lymphatic and is usually fairly rapid except for long acting preparation.
- **Subcutaneous (SC) route:** Preferred when slow absorption of drug is required. The injected drug disperses through the loose connective tissues. They dissolve in tissue

fluid before it can enter either capillaries or lymphatic. The rate of absorption depends on the blood flow and presence of vasoconstrictors or vasodilators.

- **Epidural route**: introduction of local anaesthetics between the first and second coccygeal vertebra to eliminate straining.
- **Sub-conjunctival**-disposition of a pharmaceutical preparation beneath the conjunctiva
- **Topical or local application:**

It refers to external application of drug to the body surface for localized action at accessible site, such as skin, eyes, body orifices,

- ✓ Topical treatment includes direct application to the skin but also to mucous membranes.
- ✓ Topical administration is commonly used with local anaesthetic drugs to provide surface anaesthesia of the nose, mouth, ear, bronchial tree (by spray), cornea (by drops), urinary tract or rectal mucosa.
- ✓ Intra-mammary infusion. It is used mainly for administration of antibiotics in the prevention (dry cow therapy) and treatment of mastitis, but is also used for administration of corticosteroids, usually together with antibiotics, in mastitis treatment.
- ✓ Intra-mammary infusion of local anaesthetic solution can be used for analgesia of the mucosa of the teat cistern.

Self-check:	**Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

Define

1. Disease(1pts)
2. Contagious diseases(1pts)
3. infectious disease(1pts)
4. Virulence(1pts)
5. polydipsia (1pts)
6. Differentiate tachycardia and bradycardia (2pts)
7. List 4 bacteria and 4 viral diseases (8 pts)

Note: Satisfactory rating –15 points **Unsatisfactory - below 15 points.**

Operation Sheet 1: Procedures of Temperature Taking

Procedures

1. The thermometer should be sterilized by disinfectant (antiseptics) before use;
2. It should be well shaken before recording of temperature to bring the mercury column down below the lowest point likely to be observed in different species of animals.
3. The bulb end of the thermometer should be lubricated with liquid paraffin or glycerine or soap especially in case of small pup and kitten.
4. Care should be taken so that the bulb of the thermometer remains in contact with the rectal mucous membrane.
5. The thermometer should be kept in site for at least 3-5 minutes.
6. Read the thermometer

Name: ---------- Date: ----------

Information sheet 5: Separating and caring sick or injured animals

5.1. Isolation

Isolation means segregation of animals which are known to be or suspected to be affected with a contagious disease from the apparently healthy. Preferably, such segregated animals should be housed in a separate isolation ward situated far away from the normal animal houses.

Attendants working on sick animals and equipment such as buckets, shovels etc. used for them should not be used for healthy stock. If this is not practicable the sick animals should be attended to, daily, after the healthy stock. After this, the equipment should be thoroughly disinfected before they are used on healthy stock next day; the attendant too should wash his hands and feet in antiseptic and discard the clothes in which he worked. The isolated animals should be brought back into the herd only when the outbreak ends and they are fully recovered.

Another point of importance is to keep the animal clean and warm. You have to remove feaces or dung regularly to avoid flies accumulating around the sick animal. Normally, healthy animals are able to keep themselves clean but sick ones are usually too weak to bother themselves with cleanliness.

Similarly, sick animals fail to regulate their body temperatures properly, thus, cover them with a blanket or a rug. After all, it's all about what's best for the sick animal. Ideally, it is preferable to attend to the feeding and watering of healthy animals first before you visit sick ones. This will help you avoid spreading infections or contamination to the healthy ones.

Otherwise, you might have to disinfect your boots and remove your overalls after attending to the sick animals. In addition, after dealing with sick animals, it is important to always wash and store all equipment used properly.

5.2. Quarantine

Quarantine is the segregation of apparently healthy animals (especially animals being brought into the herd for the first time) which have been exposed to the risk of infection from those animals which are healthy and unexposed to the risk of infection. The idea is to give sufficient time for any contagious disease that the quarantined animals may have

to become active and obvious. Hence, the quarantine period depends on the incubation period of a disease. But in practice a quarantine period of 30 days covers almost all diseases. For rabies the quarantine period should be about six months

Since the period of incubation or latent period of the various infectious diseases differs very considerably, a special quarantine period is allowed for each and one that gives a margin of safety. The incubation period of rabies for example may extend to six months, or possibly longer, while on the other hand the quarantine period for foot and mouth disease need only a fortnight.

During quarantine period animals should be thoroughly screened for ^parasitic infestation by faecal examination. The animal should be subjected to dipping or spraying.

5.3. When managing animals that are in quarantine and isolation day-to-day

- Make all farm staff fully aware of recommended separation procedures
- Best practice is for separate staff to take responsibility for tending animals in quarantine or isolation, using separate Personal Protective Equipment
- Where it is not possible to use separate staff:
  - ✓ Use separate Personal Protective Equipment
  - ✓ Tend to these animals last, after healthy animals
- Always disinfect or change Personal Protective Equipment after the tending routine is complete
- Inspect animals in quarantine regularly and look closely for signs of disease
- If you identify signs of disease contact your vet immediately regarding diagnosis, treatment and future management
- Inspect animals in isolation regularly, monitor closely and report progress to your vet
- Take care when handling and disposing of contaminated bedding, waste and feed

.

Fig 1: Isolation Room

An isolation area should:

- Provide an air space, water source and feed source separate from the rest of your livestock.
- Prevent direct contact with the rest of your livestock.
- Provide a clean, dry, comfortable resting space for the animal(s).
- Provide transition to a new ration.
- Provide adequate restraint facilities for examinations and administration of treatments.
- Allow equipment storage in that area (e.g., shovels, halters, buckets, etc.) for use only in the isolation area.
- Prevent the movement of equipment and manure from the isolation area to other locations with livestock.
- Ensure workers clean hands and boots and change clothes before going to other areas.
- Be easy to clean and disinfect.
- Prevent access to other animals like pet dogs or wildlife.

Self-check:	**Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why it is important isolation(2 pts)
2. Define quarantine(1 pt)

Note: Satisfactory rating –3 points Unsatisfactory - below 3 points.

Information sheet 6: Maintaining required health records

6.1. Introduction

Health records maintenance is the part of records management that relates to the operation of a healthcare practice. It is the field of management that is responsible for all records throughout their lifecycle from creation, receipt, maintenance, and use to disposal. For an in-depth look at records management, read Records Management: Maintaining Your Organization's Information.

A medical record can help both the physician and the patient. For the patient, the record can outline one's history and treatment plan in an easily-accessible way. For the physician, it can provide support about the correctness of that treatment plan. A good medical records management system can be the difference between life and death if someone needs to check a test, a medication, or make a quick medical decision.

6.2. Benefits of Medical Records Management

As the requirements for medical records change, it is important for medical practices, hospitals, skilled nursing facilities, and long-term care facilities to have a medical records management system in place that includes automating, capturing, storing, and disseminating records. The system improves record location and tracking, even for records people don't frequently use. It can also preserve historical and vital information about a medical facility in case of a disaster or legal requirement.

A records management system can also make it easy to transfer or release information between offices — both patients and physicians can access the information in a timely manner without duplicating efforts. Arguably, this type of visibility can increase patient safety, reduce mistakes, and increase confidence in a treatment plan. From a productivity standpoint, medical records management might address litigation risks, lower operating costs (due to reduced physical storage needs), and boost employee productivity, mobility, and efficiency.

Some medical records management systems will link to patient management systems, allowing connections between billing and other systems. For more about patient management,

Self-check:	**Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is the importance of health record (1pt)

Note: Satisfactory rating –1 points Unsatisfactory - below 1 points.

LG # -29	LO #2: Prepare for Treatment of Animals
Instruction sheet	

learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying animals affected by infection or parasites, or requiring treatment
- Determining the type and severity of infestation of parasites
- Sourcing information on past treatment of animals
- Determining and preparing the type and scope of treatment
- Preparing equipment and materials and treatment site

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify animals affected by infection or parasites, or requiring treatment
- Determine the type and severity of infestation of parasites
- Source information on past treatment of animals
- Determine and preparing the type and scope of treatment
- Prepare equipment and materials and treatment site

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test”

Information sheet 1: Identifying animal’s treatment affected by infection or parasites.

1. Administer animal treatments

1.1. Drug Dosage Forms

- **Oral dosage forms: -**refers to administration of drug through the mouth. Although some oral solutions or suspensions are commercially available, the most commonly used preparations are solid oral dosage forms such as

Boluses: are large compressed tablets, used for horses & cattle provide large doses.

Capsules: is cylindrical shell made of gelatine & glycerine & suitable for drugs in powder forms & certain liquid drugs.

Syrups: are concentrated solutions of sugar in water or other aqueous liquids with a medicinal agent added.

Powders: are medicinal preparations consisting a mixture of two or more drugs in the form of fine particle for oral or topical use.

Solution: are liquid preparations with one or more drugs usually dissolved in water.

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- **External dosage forms:**
  - ✓ **Ointment**- semisolid preparation for external application.
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  - ✓ **Lotion**- an aqueous solution or suspension for local application.
  - ✓ **Spray**-a drug applied in liquid form by pressure.

- **Inhalation dosage forms**: gaseous & volatile liquid anaesthetic agent (drugs), given by inhalation. E. g. Halothane

1.2. Routs of Drug Administration

- **Oral administration:**

There are large numbers of pharmaceutical preparations available for oral administration. Solid dosage forms (powders, tablet, capsules, pills etc) and liquid dosage forms (syrups, emulsion, mixture, drench, electrolytes etc)

- **Parenteral administration** The most frequently used are IV, IM, SC; common but less frequently used routes include eqidural, intratracheal, intraperitonial.

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- **Subconjunctival**-disposition of a pharmaceutical preparation beneath the conjunctiva
- **Topical or local application:**

It refers to external application of drug to the body surface for localized action at accessible site, such as skin, eyes, body orifices,

- ✓ Topical treatment includes direct application to the skin but also to mucous membranes.

- ✓ Topical administration is commonly used with local anaesthetic drugs to provide surface anesthesia of the nose, mouth, ear, bronchial tree (by spray), cornea (by drops), urinary tract or rectal mucosa.
- ✓ Intramammary infusion is a special case of topical treatment. It is used mainly for administration of antibiotics in the prevention (dry cow therapy) and treatment of mastitis, but is also used for administration of corticosteroids, usually together with antibiotics, in mastitis treatment.
- ✓ Intramammary infusion of local anaesthetic solution can be used for analgesia of the mucosa of the teat cistern. See: Local Anesthesia of the Teat in Ruminants

Self-check:	**Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

Define

1. Internal parasite (1 pt.)
2. External parasites (1 pt.)
3. Which of the following parasites are internal parasites? (2 pts.)

A) Black leg B) Cooccidiosis C) Ticks D) All

Note: Satisfactory rating –4 points Unsatisfactory - below 4 points.

2.1 Introduction

Information sheet 2: Determining the type and severity of parasites infestation

Parasites are organisms that live in (or on) another organism, called the host. The parasites can be microscopic or large enough to see with the naked eye, and they survive by feeding from the host. They can also spread parasitic infections, which can lead to sepsis.

Infestation

The condition of being invaded or inhabited by ectoparasites such as lice, mites or ticks The term isalso sometimes applied to large internal parasites such as intestinal worms, but this is more usually referred to as **infection**.

There are three main Types of parasites that can cause disease in animal

A parasite is an organism that lives on or in a host organism and gets its food from or at the expense of its host. There are three main classes of parasites that can cause disease in animal and humans such as:

- Protozoa,
- Helminths, and
- Ectoparasites.

A) Protozoa

Protozoa are microscopic, one-celled organisms that can be free-living or parasitic in nature. They are able to multiply in humans, which contributes to their survival and also permits serious infections to develop from just a single organism.

Transmission of protozoa that live in an animal's intestine to animals typically occurs through a fecal-oral route (for example, contaminated food or water

Protozoa that live in the blood or tissue of animal are transmitted to other animals by an arthropod vector (for example, through the bite of a mosquito or sand fly).

The protozoa that are infectious to animal can be **classified** into four groups based on their mode of movement:

- Sarcodina – the ameba, e.g., *Entamoeba*
- Mastigophora – the flagellates, e.g., *Giardia*, *Leishmania*
- Ciliophora – the ciliates, e.g., *Balantidium*

B) Helminths

Helminths are large, multicellular organisms that are generally visible to the naked eye in their adult stages. Like protozoa, helminths can be either free-living or parasitic in nature. In their adult form, helminths cannot multiply in animal.

There are three main groups of helminths (derived from the Greek word for worms) that are animal parasites:

- Flatworms (platyhelminths) – these include the trematodes (flukes) and cestodes (tapeworms).
- Thorny-headed worms (acanthocephalins) – the adult forms of these worms reside in the gastrointestinal tract. The acanthocephala are thought to be intermediate between the cestodes and nematodes.
- Roundworms (nematodes) – the adult forms of these worms can reside in the gastrointestinal tract, blood, lymphatic system or subcutaneous tissues. Alternatively, the immature (larval) states can cause disease through their infection of various body tissues. Some consider the helminths to also include the segmented worms (annelids)—the only ones important medically are the leeches. Of note, these organisms are not typically considered parasites.

C) Ectoparasites

Although the term ectoparasites can broadly include blood-sucking arthropods such as mosquitoes (because they are dependent on a blood meal from a human host for their survival), this term is generally used more narrowly to refer to organisms such as

- Ticks
- Fleas
- Lice, and Mites

Arthropods are important in causing diseases in their own right, but are even more important as vectors, or transmitters, of many different pathogens that in turn cause tremendous morbidity and mortality from the diseases they cause.

Severity of infestation of parasites on animal health and welfare

The negative impact parasites have on the health and welfare of animal can include:

- Blood loss which, if substantial, can lead to anemia and death

- Diarrhea which, if severe, can lead also to death
- Reduced appetite, resulting in debilitated animals that are more susceptible to other diseases
- Transferal of diseases from one animal to another as some parasites can also act as vectors (carriers)
- Open sores on the skin of livestock from external parasites like flies
- Reduced grazing behavior or agitation (fly worry) due to flu annoyance.

Severity on livestock productivity

- Reducing growth rates
- Reducing reproductive rates
- Reducing income through condemnation of carcass parts at slaughter
- Reducing milk production
- Reducing weight
- Damaging hides and fleeces
- Death

Following floods (or significant amounts of rain), the populations of biting insects (buffalo fly, midges, mosquitoes and stable fly) and ticks can increase dramatically.

It is important to be aware of this and implement proper control measures to prevent animal welfare issues and losses in productivity.

Self-check:	**Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List the three type of animal parasites (3 pts)
2. Explain on of the type of parasites(1pt)

Note: Satisfactory rating –4 points Unsatisfactory - below 4 points.

Information sheet 3: Sourcing information on past treatment of animals

3.1. Introduction

Past treatment of animal is a tool for translating patient's goals of care into medical orders so that they are easily located and portable across care settings. Past is not just a specific set of medical orders documented on a form; it is also an approach to end-of-life planning based on conversations between patients, loved ones, and medical professionals. The past Program is designed to ensure that seriously ill patients can choose the treatments they want and that their wishes are honored by medical providers. A key component of the system is thoughtful, facilitated advance care planning conversations between health care professionals and patients and those close to them. Completion of a past form requires shared decision making between the health care professional signing the form and the patient, or his/her legally authorized health care representative. To complete the past form, there must be a discussion of the patient's diagnosis and prognosis; the available treatment options given the current circumstances, including the benefits and burdens of those treatments; and the patient's goals of care and preferences of treatment. Together, they reach an informed decision about desired treatment, based on the person's values, beliefs and goals for care. Then, if the patient wishes, his/her health care professional completes and signs a MIPOST form based on the patient's expressed treatment decisions. Past is not for everyone; only patients with serious advanced illnesses should have a past form. For patients where a past is appropriate, their current health status indicates the need for standing medical orders for emergent or future medical care. The past form is for seriously ill patients for whom their physicians would not be surprised if they died in the next year.

3.2. The importance of Past treatment

- Past fills a gap that cannot be met by an advance.
- Emergency Medical Services (EMS) is required by law to provide aggressive treatment unless otherwise directed by a medical order.
- In the absence of a past form patients will receive advanced cardiac life support, including cardiopulmonary resuscitation (CPR), endotracheal intubation, and defibrillation by emergency medical personnel based on standard protocols.

- Past treatment forms specify address cardiac life support and are only applicable when an animal is not breathing and has no pulse.
- The past form is more specific and addresses additional medical interventions such as intubation, transport, antibiotics, cardio version, tube feeding and hospitalization.

Self-check: **Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why is necessary past treatment (4pts)

Note: Satisfactory rating –4 points Unsatisfactory - below 4 points.

Information sheet 4: Determining and preparing the type and scope of treatment

4.1. Introduction

Scope of treatment means those medical interventions, procedures, medications, and treatments that a patient, in consultation with a health care practitioner, has determined are appropriate, necessary, and desired by and for the patient and will always include the provision of comfort measures.

Veterinarians protect animal health, animal welfare and public health. The practice of veterinary medicine includes, but is not limited to.

- Diagnosis
- Treatment
- Prescribing
- Surgery, and
- Disease prevention.

Treating animals without veterinary involvement or management could harm animal patients and endanger public health. This coalition's intention is to provide guiding principles to state veterinary medical associations that will assist them as they work with licensing boards and legislators on these issues.

4.2. The importance of scope treatment

- Help to better understand the situation of a patients
- Health condition of an animal
- Possible treatment choices
- Options for care that are best for animal/ patients
- To make alternative Designation.
- Veterinarians protect animal health, animal welfare and public health.
- The practice of veterinary medicine includes, but is not limited to,
  - ✓ Diagnosis,
  - ✓ treatment,
  - ✓ prescribing,
  - ✓ surgery, and
  - ✓ Disease prevention.

4.3. Supervision by a veterinarian

- **Immediate supervision**

Which means that the attending veterinarian is in the immediate area, within audible and visual range of the animal patient and the person treating the patient? With this highest level of supervision, the veterinarian can best avert harm to the animal and/or the animal owner, intervene if an emergency arises, and respond to injury during care by the non-veterinarian

- **Direct supervision**

Which indicates that the attending veterinarian is readily available on the premises where the patient is being treated?

- **Indirect supervision**

Which means that the attending veterinarian has given either written or oral instructions for treatment of the patient and is readily available by telephone or other forms of immediate communication?

Self-check:	**Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List some scope of vet professionals(2pts)

Note: Satisfactory rating –2 points Unsatisfactory - below 2 points

Information sheet 5: Preparing equipment and materials and treatment

5.1. Introduction

To take good care of animals, to diagnose if animals are diseased and to treat animals there are some tools that can be useful and practical to have within reach In the following some of the more common tools are listed which are widely available in Kenya and East Africa.

Important tools for good care of animals: Not all the mentioned tools are strictly necessary, but come in useful in emergencies or when the veterinarian is not available.

A) Thermometer.

A thermometer is very useful to check body temperature. A veterinary thermometer is very cheap and can be found in most agro-vet shops. It is an essential tool for the serious livestock farmer to help her or him in judging animal health. Normal body temperature varies a little bit during the day and according to climate, as can be seen in below table.

If the body temperature is significantly (<0.5-1^{0}C) higher or lower than indicated below, there is usually a problem to be solved.

Fig 1: body temperature taking

B) Strip Cup

A strip cup is a very useful tool and a must for all dairy farmers. Milking the first few strips into a strip cup will show if there are any lumps present indicating beginning or advanced mastitis, which should be controlled urgently. It is a tool that should be in use in the milking parlous of every serious dairy farmer. If actual strip cups cannot be found, a normal cup with black plastic tied onto the top can be used instead. The main thing is to observe the quality of the first milk streaks when starting to milk.

Fig 2: strip cup test

C) California Mastitis Test (CMT)

A more efficient tool for early detection of mastitis is the California Mastitis Test (CMT). This test consists of a paddle with 4 cups, one for each quarter. Hold the handle in one hand. Then milk a streak of milk from each quarter into the corresponding cup of the padddle (Front-Left, Front-Right, Hind-Left, Hind-Right) and remembering that the handle of the paddle points towards the tail of the cow. Next add a roughly equal or slightly higher volume of test solution from the CMT bottle and gently rotate the paddle to mix and test solution. If the mix of milk and test solution stays liquid, the quarter is healthy. But if the mix shows varying degrees of stickiness or sliminess this is an indication of mastitis in the quarter where the milk came from.

Fig3: California Mastitis testing kit

D) Hoof trimming tools

In some areas and especially where the ground is soft, the hooves of animals grow faster than normal exercise can wear them down. Hoof trimming becomes necessary in order

for the animal to be able to walk normally. The problem of overgrown hooves is particularly important for cows kept in zero grazing that do not exercise or walk on pasture at all. Also donkeys working on rough ground must be trimmed regularly to keep the hoofs in normal shape. Deformed hoofs makes normal walking difficult and painful for the animal. The legs may twist in different directions. The hooves become deformed and soft and prone to infections like foot rot. Overgrown long hooves are also dangerous for the udder because they may damage the teats when the cow stands up.

1. Hoof knives

Hoof trimming knives are usually available from most well stocked agro veterinary shops but if not so, any good sharp knife can assist. In addition to hoof trimming knives professional hoof trimmers will also make use of more sophisticated tools like a hoof pincer (for clipping the dew claws), hoof shears (for cutting overgrown edge of the claw), toeing knife and a hoof rasp.

Figure 4: Hoof trimming knives

2. Hoof trimmer

Hoof trimming is however a specialized procedure and proper instructions and training from qualified livestock officers will be extremely useful for any livestock farmers. Offering hoof trimming as a paid service is a profession in Europe and could also become an income generating activity for keen young people who train on hoof trimming.

E) Glass slides for making blood smears

Blood samples are very useful for examining diseases in cattle. Many diseases such as Babesiosis and Anaplasmosis are caused by organisms which will show up under the microscopic in a good blood smear. Glass slides are available from pharmacies and from

ago-vet shops, they are cheap and help in getting a diagnosis from a vet who does not even have to visit the farm. Treating a cow against the wrong disease will not only cost you the drug but also the value of the whole cow if it dies.

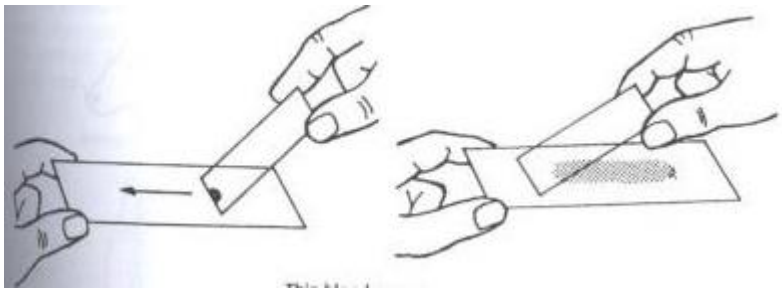

Figure 5: Glass slides for making blood smears

A) Burdizzo castrator

A Burdizzo castrator (no blood) is the best and cleanest tool for castrating bulls, rams and bucks - farmers can share in the costs of buying this tool from an agro-vet shop; two different sizes are available (14" for bulls and a smaller size for sheep and goats). The Burdizzo should be used on the young animal. There are Burdizzos for animals of different sizes. You should always remember that the Burdizzo is a valuable instrument and keep it clean and oiled.

Figure 6: Burdizzo Castration Forceps

- **Needles and stitching material** (thread = suture) for stitching wounds.
- **Tape measure** for measuring animals to estimate their weight. When treating animals it is very important to know the approximate body weight in order to give correct dosage of medicine

- A **Trocar** for making a hole into the rumen to treat serious cases of bloat. Trocars come in two sizes, for cattle and for sheep.

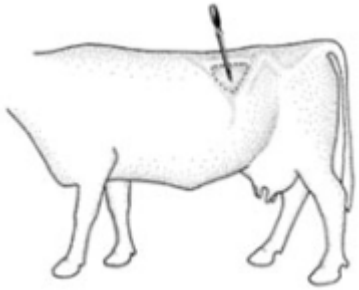

Figure 7: Use of a Trocar

B) Other useful tools

- **Bandages** and clean clothes for cleaning wounds and covering them and for holding broken legs in place
- **Bottle** for giving medicine by mouth. If a glass bottle is used, it is useful to put a rubber tube over the end to stop it breaking
- **Container** for sterilizing equipment. A cooking pot with a lid will do. Sterilize equipment by boiling it in water
- Scalpel. Scalpels have sterile blades that can be thrown away after use
- Pen and notebook for keeping records
- **Rope**. Ropes are essential for any livestock keeper! They are very useful for tying up animals, for making halters to lead animals during transport; fine clean ropes (sterilized in boiling water) can also be useful when assisting a cow with difficult birth
- **Soap or soap flakes** - for washing hands and arms and for washing the cows rear end when assisting with difficult births
- **Syringes and needles for injection**. With the very great distance between vets, skilled farmers can learn to do basic treatment before the vet is called. Most useful sizes are 10ml, 20ml, and 50ml. Some syringes can be boiled to sterilize them for reuse - others cannot be boiled so need to be thrown away after use

- A syringe without needle is useful for measuring liquids such as dewormers or medicines given by mouth, and for flushing wounds and abscesses
- **Castration rings** - mostly for goats and sheep but can also be used for small new born calves

2. Preparing treatment

- **Oral dosage forms**: -refers to administration of drug through the mouth. Although some oral solutions or suspensions are commercially available, the most commonly used preparations are solid oral dosage forms such as tablets, capsules, granules, powder, paste & boluses etc.
  - ✓ **Boluses**: are large compressed tablets, used for horses & cattle provide large doses.
  - ✓ **Capsules**: is cylindrical shell made of gelatine & glycerine & suitable for drugs in powder forms & certain liquid drugs.
  - ✓ **Syrups**: are concentrated solutions of sugar in water or other aqueous liquids with a medicinal agent added.
  - ✓ **Powders**: are medicinal preparations consisting a mixture of two or more drugs in the form of fine particle for oral or topical use.
  - ✓ **Solution**: are liquid preparations with one or more drugs usually dissolved in water.
  - ✓ **Pastes**: are absorptive powders placed in a gelatinous base, used to adhere to the skin& thereby act as “spongy” to absorb exudates& moisture, also as a physical barrier to protect the skin.
  - ✓ **Granules**: are small solid pills, whose active ingredient is greater than that of powder in size.
- **Parental dosage forms**: the most common parental dosage forms are stable aqueous solutions &subcutaneous implants. The active component of stable aqueous solutions may be dissolved in an inert vegetable oil, which delays absorption. E.g. Procaine penicillin-G, Amoxicillin trihydrate, Oxytetracycillin.
- **External dosage forms**:

- ✓ **Ointment**- semisolid preparation for external application.
- ✓ **Cream**- a viscous semisolid, consisting of oil in water emulsion or water in oil emulsion.
- ✓ **Dusting powder** e. g. popular antibacterial agent applied on animal wounds.
- ✓ **Lotion**- an aqueous solution or suspension for local application.
- ✓ **Spray-**a drug applied in liquid form by pressure.

- **Inhalation dosage forms**: gaseous & volatile liquid anaesthetic agent (drugs), given by inhalation. E. g. Halothane

2.2. Routs of Drug Administration

- **Oral administration:**

There are large numbers of pharmaceutical preparations available for oral administration. Solid dosage forms (powders, tablet, capsules, pills etc) and liquid dosage forms (syrups, emulsion, mixture, drench, electrolytes etc)

- ✓ **Parenteral administration** The most frequently used are IV, IM, SC; common but less frequently used routes include eqidural, intratracheal, intraperitonial.
- ✓ **IV route** used for rapid response and aqueous solution is preferable. Irritating and non-isotonic solutions should be injected slowly and carefully.
- ✓ **Intramuscular (IM) route:** It is used for relatively irritant drugs, or for administration of depot preparation, for aqueous or oleaginous suspensions. Absorption occurs either haematogenous or via lymphatic and is usually fairly rapid except for long acting preparation.
- ✓ **Subcutaneous (SC) route**: Preferred when slow absorption of drug is required. The injected drug disperses through the loose connective tissues. Theydissolve in tissue fluid before it can enter either capillaries or lymphatic. The rate of absorption depends on the blood flow and presence of vasoconstrictors or vasodilators.
- ✓ **Epidural route**: introduction of local anaesthetics between the first and second coccygeal vertebra to eliminate straining.

- ✓ **Subconjunctiva**l-disposition of a pharmaceutical preparation beneath the conjunctiva

- **Topical Administration**

It refers to external application of drug to the body surface for localized action at accessible site, such as skin, eyes, body orifices, body cavity

- ✓ Topical treatment includes direct application to the skin but also to mucous membranes.
- ✓ Topical administration is commonly used with local anaesthetic drugs to provide surface anesthesia of the nose, mouth, ear, bronchial tree (by spray), cornea (by drops), urinary tract or rectal mucosa.
- ✓ Intramammary infusion is a special case of topical treatment. It is used mainly for administration of antibiotics in the prevention (dry cow therapy) and treatment of mastitis, but is also used for administration of corticosteroids, usually together with antibiotics, in mastitis treatment.
- ✓ Intramammary infusion of local anaesthetic solution can be used for analgesia of the mucosa of the teat cistern. See: Local Anesthesia of the Teat in Ruminants

Self-check:	**Written test**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List and explain 3 treatment materials(6pts)
2. Mention Route of drug administration(2pts)

Note: Satisfactory rating –8 points Unsatisfactory - below 8 points

LG # -30	LO #3: Administer Animal Treatments
Instruction sheet	

learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Handling and restraining animals safely
- Administering authorized animal treatmentshygienically and consistently
- Identifying treated animals from non-treated animals
- Implementing preventative medicine programs for external and internal parasites and microorganisms
    - ✓ Strategic de-worming
    - ✓ Insect control
    - ✓ Quarantine
    - ✓ Chemo prophylactic treatments
    - ✓ Vaccination

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Handling and restraining animals safely
- Administering authorized animal treatmentshygienically and consistently
- Identifying treated animals from non-treated animals
- Implementing preventative medicine programs for external and internal parasites and microorganisms
    - ✓ Strategic de-worming
    - ✓ Insect control
    - ✓ Quarantine
    - ✓ Chemo prophylactic treatments
    - ✓ Vaccination

Learning Instructions:

1. Read the specific objectives of this Learning Guide.

2. Follow the instructions described below.

3. Read the information written in the “Information Sheets”.

4. Accomplish the “Self-checks” which are placed following all information sheets.

5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work 6. If you earned a satisfactory evaluation proceed to “Operation sheets 7. Perform “the Learning activity performance test”

Information sheet 1: Handling and restraining animals safely

1.1 Introduction

Proper handling and restraint are essential to the welfare of captive animals, allowing them to be examined, groomed and treated in ways that contribute to their optimum quantity and quality of life. The aim of the animal restraining is to prepare future or current veterinarians and veterinary technologists, technicians/nurses, and assistants to be able to handle animals more safely and gain the confidence of animals and their owners. In turn, they will be able to instruct owners in proper animal handling methods, reducing the risk of physical injury or mutual infectious diseases.

1.2. Safe animal Handling

- Be aware of the special stressors for animals in the clinic setting.
- Never put your face directly into the face of a dog or cat.
- Do not move in behind or crowd around a dog.
- Concentrate on the animal you are handling
- Never sit on the floor while handling/examining a dog.
- Always be prepared to protect yourself
- Safe and effective animal handling requires a thorough understanding of the normal behavior and responses of each species.

1.3. Restraining

Restraint is the use of manual, mechanical, or chemical means to limit some or all of an animal's normal movement for such purposes as

- Examination
- Collection of samples
- To attend animals safely
- To prevent injuries to animals
- To carry out operations and administer of drugs.

1.4. Basic guidelines for performing animal restraint

To work safely with an animal, a person should:

- Understand basic animal behavior
- Understand how to communicate with the animal
- Use appropriate restraint techniques
- Use restraint equipment properly
- Wear appropriate protective clothing and equipment
- Maintain appropriate vaccination status

1.5. Types of Restraining Techniques

A) Physical restraint

B) Chemical restraint

C) Verbal

1.5.1. Physical restraint: Are the use of manual or mechanical means for controlling/immobilization of animals such as

- Rope Halter:
- Nose Tongs
- Tail Restraint
- Raising the front leg
- Raising the back leg manually
- Milking restraint:
- Tail rope
- Restraint of the head
- Crushes restraining methods
- Burley method of casting:
- Rope squeeze

1.5.2. Physical restraint of horse:

- Halter
- Twitch
- Casting a horse
- Double side-line casting

1.5.3. Sheep restraint:

- Ramping (sitting Position)
- By between legs

1.6. Chemical restraint

Chemical restraint refers to the administration of certain medications to restrain agitated patients from behavior that is harmful to themselves or others, including the medical staff attending to them. The administration of a medication is considered a chemical restraint when used to sedate an agitated patient and not for direct therapeutic reasons.

- Chemical restraint such as
- Sedatives,
- Tranquilizers or
- Anesthetic agents for animal restraint.

3. Verbal restraint:

Commands such as **sit, stay, come, down**, may be useful tools to encourage a dog to cooperate. Also, soft quiet words can calm a frightened animal. Yelling or screaming should never be used as it can cause the animal to become more fearful or aggressive

Self-check:	**Written Exam**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is restraining (2pts)
2. List Type of Restraining (3pts)

Note: Satisfactory rating –5 points Unsatisfactory - below 5points

Information sheet 2: Administering authorized animal treatments

2.1. Introduction:

Authorized animal treatments are administered following the enterprise guide lines Veterinary workers may be exposed to hazardous drugs when they handle drug vials; compound, administer, or dispose of hazardous drugs; clean up spills; touch surfaces that are contaminated with these drugs; or clean bedding, cages, kennels, or waste of treated animals. Skin absorption, inhalation, and ingestion are the most likely ways these workers may be exposed. Needle sticks or sharps injuries pose a risk of exposure in veterinary health care settings. Administration of medications to animals presents additional exposure opportunities for workers not encountered with human patients. Many hazardous drugs and their metabolites can be excreted in urine and faeces for up to 72 hours or more. In addition, oral medications may be present in vomits for several hours.

Directions: Read labels and answer the questions listed below before administrating any drugs:

- What is the name of the product
- What species or type of animal is this product approved for
- What uses is this drug approved for
- Who can administer this product
- What is the proper dosage for this product
- How should it be administered
- Is there a withdrawal period for this product If so, how long is the withdrawal period
- How should this product be stored?
- Who manufactured this product?
- Is there an expiration date?
- What other information is included on the label?

Self-check:	**Written Exam**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why it's important to use authorized animal treatments (2pts)

Note: Satisfactory rating –2 points Unsatisfactory - below 2points

Information sheet 3: Identifying treated animals from non-treated animals

3.1. Introduction

Producers must be able to identify treated animal or groups of animals from the time they receive the animal health product until the withdrawal time established for that product has elapsed. Regardless of the identification method used, a written record of the

treatment should be kept on file for one year after the hogs have been marketed. It is important to remember that unanticipated sales decisions of animals treated with animal health products can cause volatile residues.

There is no way to keep meaningful records if animals are not identified, individually or by pen or location. Many producers use some form of identification card (such as a animal card) or building record for tracking animals. When individual animal identification is not practical, an identifiable group of animals (pen/building/site) can be tracked and its records retained until the product's withdrawal time has elapsed. Regardless of the identification system used, pork producers should develop and train employees to fill, read and understand treatment records of animals that are to be treated, moved or sold.

3.2. Methods of identifying treated animals

The following methods can be used to identify individually treated animals:

- **A card** that stays with the animal and is retained after the withdrawal period has elapsed. This works best for adults housed individually in a pen or stall.
- **Paint marks**. These are easy to apply and can be used for treatments with short withdrawal times, but may rub off or rub onto untreated pen mates. This method is inappropriate for withdrawal times of more than several days.
- **Tattoos.** These are permanent, but depending on the type the tattoo may be hard to apply and difficult to read at a distance.
- **Ear tags**. Tags are easy to see, but may be cumbersome to apply.
- **Ear notches**. These can be recorded on a card to identify treated animals. Notching systems may vary, so caretakers must be familiar with site-specific notching systems.

3.3. Identifying groups of treated animals

- When treated animals are identified by pen, room or group number, it is important that the entire group remains intact until the withdrawal time has elapsed.
- Any animal removed from the group should be individually identified and the withdrawal time recorded.

- With this form of group identification, each nursery, grower and finisher pen must be uniquely identified in a way that is clear to all caretakers..
- Methods of identifying groups of animals may include a card, barn sheet or other visual marking that stays with the group(s) of animals or is retained in the office.

Self-check:	**Written Exam**

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain methods of identifying treated animals(5pts)

Note: Satisfactory rating –5 points Unsatisfactory - below 5points

Information sheet 4: Implementing preventative medicine programs for external, internal parasites and microorganisms

4.1. Introduction

External parasitism results in poor quality animal products especially skins and lost income to producers. Common external animals' parasites include ticks, lice, keds and mites. Some parasites feed on blood causing blood-loss anemia, especially in young animals. The result is unthrifty, poor-performing animals. A regular program of treatment and prevention of external parasites should be an important part of a flock health program. The benefits of an effective external parasite control program include increased comfort for animals, improved performance, and higher quality of products. **4.2. Effects of external parasites**

External parasites limit production in animal in many ways and result in economic loss. The following are some of the major ones:

- Attachment to the host causes irritation of the skin with subsequent ulceration and secondary infections.
- They feed on body tissue such as blood, skin, and hair. Heavy infestations are associated with anemia (adult female ticks can, for example, suck up to 10 ml of blood)
- Cause discomfort and annoyance. Weight loss, loss of condition and reduction in milk production may occur as a result of nervousness and improper nutrition because animals spend less time eating..
- External parasites can transmit diseases from sick to healthy animals due to their habit of moving from one host to another.
- Bites can damage sensitive areas of skin (teats, vagina, eyes, etc.)
- Tick attachment between the claws of the feet may cause severe lameness.
- Cause huge economic losses through skin damage rendering it unsuitable for the leather industry. Ethiopia used to get the second largest foreign currency earnings from the export of skins and hides. This has been deteriorating due to the decrease in skin quality. Thirty years ago tanneries in Ethiopia used to produce 70% of processed skins with grades 1-3. About 10-20% of the skins were graded as poor quality. Currently, only 10-15% is in the good category while the rest are downgraded or rejected due to the increase in external parasite infestations during the period.

- The financial burdens of diagnostic, therapeutic or preventive programs at flock, community and national levels have large financial requirements.

4.1.3. Prevention program of external parasites

Rather than waiting until the problem of external parasites becomes serious, farmers should maintain a strict preventative program to controlling external parasites.

- Conduct a thorough physical evaluation of animal at least once weekly. Run your hand over each animal's hair coat, visually inspecting for excessive hair loss, flakes of loose skin, areas of skin irritation, and any crusty lesions or bumps that might indicate infection with an external parasite.
- Immediately separate and place any animal that shows sign of parasite infection or seems to be unthrifty. This helps to reduce the chances of passing infection on to the rest of your animals.
- Quarantined animals should not be mixed with the main flock until treatment is complete and the parasite eradicated.
- Isolate newly introduced animals and treat them for external parasites before mixing them with other animals.
- Practice good sanitation habits.
- Spray housing with an appropriate pesticide every two weeks if possible.
- Farmers should also be aware of ways to reduce the number of ticks on pasture.
- Control by good animal hygiene
- If the above measures are not effective, treat the animals with appropriate pesticide.

Table1. Types of acaricides commonly used and their target parasites

Compound	Generic name	Trade name	Target ectoparasites
Organophosphates			
	Coumaphos	Asuntol	Lice, ticks, mites, horn flies
	Trichlorfon	Neguvon, chlorfos	Lice, mites
	Diazinon	Neocidol	Ticks, lice, mites, horn flies
	Dioxathion	Delnav	Horn flies, lice, mites
	Fenthion	Baytex, tiguvon	Horn flies, lice
	Malathion	Malathion	Lice, kids, mites
	Chlorpyrifos	Dursban 26 E	Lice, horn flies
Chlorinated Hydrocarbons			
	CHC	Lindan, BHC, Hexachloran	Mites, lice, ticks, flies
	Thioden	Endosulfan	Mites, lice, ticks, flies
Carbamates			
	Carbaryl	Sevin, Vioxan	Mites, lice, ticks, lice
	Promacyl	promicide	Mites, lice, ticks, flies
Pyrethrins & pyrethroids			
	Deltamethrin	Cooper	Flies, including tsetse flies
	Cypermethrin	Ectopor 020 SA	Ticks, horn and face flies
Avermectins			
	Doramectin		Mites, lice
	Ivermectin	Ivermectin	

4.2. Preventative medicine programs for internal parasites.

1. Herd management

An animal is better able to resist or tolerate internal parasites when its living conditions are good. Links between diet, particularly vitamins and minerals, and susceptibility to internal parasites have been established in certain cases

2. Pasture management

Pasture management that is designed to prevent internal parasites requires long-term planning. It is by varying such factors as the density and age groups of animals and the time and intensity of grazing that serious infections can be avoided

- **Animal density**

Overpopulation increases the concentrations of parasites. It is generally estimated that parasite infections increase with the square of the animal load per surface unit. Therefore, for a given parcel of land, parasite infestations are four times greater where animal density is doubled.

- **Pasture rotation**

Pasture rotation, or intensive grazing, consists in dividing the pastures into parcels of land of varying sizes called paddocks and frequently moving the animals from one paddock to another to optimize grass use.

- **Grazing height**

About 80% of parasites live in the first five cent meters of vegetation. Parasite infection and multiplication are prevented by letting animals graze only 10 cm from the ground in a field where there are parasites

- **Grazing time**

The drier the grass, the more parasites will stay at the base of the plants. It is estimated that in wet grass, larvae can be found over 30 cm away from the pats, whereas they venture only a few cent meters away when the grass is dry. The risk of infection is greatly lowered by waiting until the dew has lifted or until the grass has dried after rain before putting animals out to pasture.

- **Grazing by age group**

Since the susceptibility of animals varies with age, it is logical to graze the younger animals in fields where parasite populations are very low

- **Multispecies grazing**

Producers who have more than one animal species (e.g. cattle and sheep) can alternate grazing of different animal species which, although not foolproof, can help to break the parasite cycles. Several parasite species cannot infect two different animal species. There are even certain species of worms that affect only a particular ruminant species.

3. Soil management

- **Resting the land**

This consists in preventing the animals from grazing in the same field or paddock. Since freezing temperatures or droughts eliminate some infectious larvae, cold or dry periods can be relied upon to reduce or extend rest periods. A three-year rest period (short rotation) is required for a complete cleaning.

- **Manure management**

Manure to be used for spreading may be filled with parasite eggs and larvae. Composting is a good way to clean manure as the larvae and eggs of nematodes are destroyed at temperatures as low as 32 to 34 C. They are killed in as little as one hour at 50 C, and in less than four hours at 44 C.

- **Improvement of drainage**

Pastures or parts of pastures that remain wet for long periods are an ideal environment for the survival of internal parasite larvae. Standard drainage of a field may reduce the larvae's chances of survival and extend grazing periods. Localized drainage of wet patches prevents infectious larvae from persisting in an otherwise clean field

4. Deworming strategy

In most herds, 20% of the animals shed 80% of the parasite load. Therefore, in small herds it is more economical to treat only the most infected animals, this practice is used in equine and small ruminant operations. In larger production herds such as cattle, animals should be treated as management categories and each category be treated according to their risk. In large small ruminant production systems, a percentage of animals should be tested to determine if the herd needs to be treated.

Deworming protocols for every operation should be developed with a veterinary consult. Protocols will vary based on the type, location, herd, and individual animals of an operation. The southeast United States is the ideal breeding ground for parasites year round so it is important to manage parasites all year.

4.1. Deworming main goals

- Reduce the chance of developing resistant parasites.

- Reduce operational expenses for livestock producer
- Reduce the use of drugs in food animals**.**

4. 1.1. Deworming of animals

- It is essential to deworm livestock regularly.
- The individual farmer should also try to keep his herd worm-free.
- The most suitable time of deworming is the early stages of infection when the worm load is less.
- The local veterinarian should be consulted for all suggestions regarding dewormers and deworming.
- In adult animals deworming is done on examination of dung.
- It is good to deworm adult females after parturition.
- All the animals should preferably be fasted for 24 hours before giving the anthelmentic.
- Young animals should preferably be dewormed every month using a suitable anthelmentic.
- Older stock can be dewormed at 4-6 months' intervals.
- In places where heavy endo-parasite infestations are found (hot-humid regions) it is advisable to deworm heifers twice a year up to two years of age.
- Even adult stock can be drenched twice a year-once before monsoon season (May-June) and once during monsoon (August-September).

4.3. Implementing preventative medicine programs for microorganisms

General Disease Prevention and Control Measures

- Prevention of Environmental contamination
- Control of Intermediate host, vectors and reservoirs
- Control of internal parasites
- Control of arthropod pests
- Control and reducing the infection as soon as an outbreak occurs
- Isolation of sick animals
- Quarantine or newly purchased animals

- Vaccination of farm animals
- Deworming of animals
- Elimination of carriers
- Disposal of carcass
- Burial of carcass
- Burning of carcass
- Disinfection of animal houses
- Disinfection of pastures

4.4. Insect control

- **Pest animal control methods**

Successful long-term pest animal control on your property relies on cooperation with neighbours and coordination of pest management planning and control activities.

Integrated pest management recognises that in many situations, effective, long-term control of pest animals is best achieved by combining several complementary control methods.

4.4.1. Control methods may include:

- **Chemical control** - using pesticides and insecticides to control pest animals
- **Physical contro**l - using mechanical tools, equipment and machinery to capture, exclude or destroy pest animals
- **Biological control** - using animal-specific diseases to control pest animal populations or protecting livestock with guardian animals**.**

4.5. Quarantine

The term quarantine means keeping in isolation animals which are to be introduced in a herd or territory for a definite period of time as a preventive measure against the spread of infectious diseases in a healthy population. The quarantine period is usually equal to the longest incubation period of a disease.

4.5.1. Purpose of Quarantine

- Facilitate early recognition of symptoms of a contagious disease, should they develop
- Reduce risk of transmission before progression to disease has been recognized
- Early reaction is to carry out without delay the disease control activities
- To eliminate the disease and infection in the shortest possible time frame and in the most cost-effective way

4.5.2. Quarantine programmes should include the following:

- International border controls to prevent the uncontrolled entry of animals, animal products and other potentially dangerous goods.
- At the same time, border programmes should provide a legal method for entry of the above through sound animal health certification and pre- and post-quarantine.
- Licensing of traders may be considered.
- Quarantine conditions should be negotiated with exporting countries for the safe importation of animals and animal products.
- This will include pre-export testing and quarantine, animal health certification and any necessary post-arrival inspection, testing and quarantine.
- Quarantine inspection of people and goods arriving at international airports and seaports.
- Safe disposal of international aircraft and ship food waste through incineration or deep burial.

4.6. Vaccination

Vaccination protects the welfare of farm animals by preventing or reducing disease, which in turn reduces the pain and suffering often associated with illness. Healthy animals are also the cornerstone of healthy food and so vaccination can help safeguard our food produced from animals. The animal medicine sector works to provide farmers with the range of vaccines they need to protect the health and welfare of their animals. These vaccines are licensed and produced under strict regulatory conditions ensuring their safety, efficacy and quality.

4.6.1. Vaccination programmes may include

- **Systematic vaccination**

In infected countries aims to reduce the incidence, prevalence or impact of a disease with the objective of prevention, control and possible eradication. In free countries or zones, the objective of systematic vaccination is to prevent the introduction of a disease from an infected neighbouring country or zone, or to limit the impact in the case of the introduction of that disease.

- **Emergency vaccination**

Provides an adjunct to the application of other essential biosecurity and disease control measures and may be applied to control outbreaks.

Emergency vaccination may be used in response to:

- An outbreak in a free country or zone;
- An outbreak in a country or zone that applies systematic vaccination, but when revaccination is applied to boost existing immunity;
- An outbreak in a country or zone that applies systematic vaccination, but when the vaccine employed does not provide protection against the strain of the pathogenic agent involved in the outbreak;
- A change in the risk of introduction of a pathogenic agent or emergence of a disease in a free country or zone.

4.6.2. Vaccination strategies

Different vaccination strategies may be applied alone or in combination, taking into account the epidemiological and geographical characteristics of occurrence of the disease. **The following strategies may be applied:**

- **Barrier vaccination** means vaccination in an area along the border of an infected country or zone to prevent the spread of infection into or from a neighbouring country or zone.
- **Blanket vaccination** means vaccination of all susceptible animals in an area or an entire country or zone.

- **Ring vaccination means** vaccination of all susceptible animals in a delineated area surrounding the location where an outbreak has occurred.
- **Targeted vaccination** means vaccination of a subpopulation of susceptible animals.

Self-check: Written Exam

Name: ----------Date: ----------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Which of the following parasites are external parasites?(1pt)

A).Ticks B).Lice D). Fluke D).All

2. Describe disease prevention program in case of

A) Internal parasites (3pts)

B) External parasites (3pts)

Note: Satisfactory rating –7 points Unsatisfactory - below 7points

LG # -31	**LO #4: implement follow up procedures**
Instruction sheet	

learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Monitoring and reporting animal health and condition post-treatment
- Performing follow up of diseased and/or treated animals
- Identifying, assessing and controlling environmental implications
- Cleaning equipment and worksite and disposing waste
- Storing health treatments
- Documenting relevant information.

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Monitor and reporting animal health and condition post-treatment
- Perform follow up of diseased and/or treated animals
- Identify, assessing and controlling environmental implications
- Clean equipment and worksite and disposing waste
- Store health treatments
- Document relevant information.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test”

Information sheet 1: Monitoring and reporting animal health condition and post-treatment

1.1. Introduction

Care staff who work with the animals early in the morning may be best able to pick up on signs of problems before cages are cleaned and food is replaced. Appetite and food intake monitoring is best done during feeding. Monitoring sheets, filled out by direct care givers, can then be consulted by those doing rounds even if signs of possible illness have been cleaned away.

Provide caretakers with guidance on what to do if an animal with possible signs of infectious illness is identified prior to cleaning (e.g. clean that animal last after caring for healthy animals in the area, make a note on the veterinarian's log, move the animal to an isolation area if appropriate).

1.2. To implement monitoring by care staff:

- Provide training for care staff in recognition of clinical signs of disease and behavior concerns.
- Utilize daily monitoring forms for each animal in the shelter and provide training for care staff in utilizing these forms for recording all daily observations
- Look for urine/fecal output before beginning cleaning and any signs of vomit
- Record attitude prior to feeding in the morning
- Monitor appetite during feeding
- In general housing areas, if an animal appears sick, mark the cage so others are alerted
- Include weekly weight checks as part of a complete monitoring program .
- When animals remain in the shelter for longer than one month, perform a full physical exam including weight and body condition score by trained staff on a monthly basis.
- Make sure veterinary examinations are performed at least biannually for all animals, more frequently if problems are identified

1.3. Recording your findings

- Keep monitoring sheets in a separate binder so animals cannot reach and demolish them.
- If monitoring sheets are cage side, have them secured in a waterproof holder as far away from the animal as possible
- Keep a separate binder for each ward or room.
- Make sure cages and animals are both properly identified so that it is easy to connect the monitoring sheet to the correct animal.
- Move monitoring sheets to new location if animal is moved.

1.4. Special considerations for monitoring group housing

- Make sure that every animal is observed eating on a daily basis. Separate any animal that does not eat from the group, try offering different food, and perform a full physical exam if in-appetence persists.
- If diarrhea, abnormal urine, vomit, mucous (e.g. on the side of a cage) is observed, perform a careful physical exam on each animal to determine which one(s) are affected.
- If any member of a litter is observed to have symptoms of a possibly contagious illness, isolation precautions should be taken for the entire litter.
- Perform a full physical exam, including weight and body condition score, on at least a monthly basis for animals group housed long term.
- Do not group house animals with medical conditions requiring close monitoring.

Self-check:	**Written exam**

Name: ----------Date: ----------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why monitoring animal health condition daily (2pts)

Note: Satisfactory rating –2 points **Unsatisfactory - below 2points**

Information Sheet 2: Performing follow up of diseased and/or treated animals

2.1. Introduction

First and foremost, sick or injured animals are very likely to be distressed and may run, hide or bite as a result of fear, pain or their natural defense mechanisms.

If you are able to handle sick or injured wildlife then we recommend that you do the following to ensure the safety of yourself and to prevent further injury or stress to the animal:

2.2. Assess the situation:

Ensure that it is safe for you to approach the injured or sick animal

2.3. Remain calm

It is important that you remain calm when approaching the animal – you do not want to startle or scare it.

2.4. Slowly approach the animal

If you can get close to the animal, place a towel, blanket, jumper or pillowcase gently over the animal's head. This will help keep it calm and aid with handling. If it is a bird, you will need to gently wrap it in a towel or hold the wings close to its body. Place it into a secure, well ventilated cardboard box or sturdy carrier.

2.5. Transport the animal

It is best to transport in a secure, well ventilated cardboard box or sturdy carrier. Try to keep the environment quiet and dark to minimize stress. If the animal feels cold try to keep them in a warm area while transporting them. Don't try to offer food or water until you have advice from a wildlife care or vet that it is safe to do so**.**

2.5. Take note of where you found the animal

It is vital that you provide your vet or a wildlife care the location of where you found the animal, as it will need to be released back into the same or similar environment once rehabilitated**.**

Self-check: Written Exam

Name: ----------Date: ----------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is the importance of follow up of sick animal(2pts)

Note: Satisfactory rating –2 points Unsatisfactory - below 2points

Information Sheet 3: Identifying, assessing and controlling environmental implications

3.1. Introduction

The chemicals can be toxic because they can harm us when they enter or contact the body, they can threaten human health, the motor vehicle emissions of nitrogen and sulphur oxides cause acid rain which poisons the fish and other aquatic organisms in the rivers and lakes.

These chemicals are the waste from industrial and agricultural processes, structural materials, pesticides, insecticides, weedicides etc. It is evident that some chemicals are useful but many are toxic and harm the environment and our health. A human activity has a complex impact on the environment and affects a chain of interconnecting ecosystems. Use of safe and useful chemicals not only minimizes the risks occurring in the environment but also in human beings.

3.2. Factors that play a part in whether or not adverse health effects may result from an exposure are:

- The type of chemical
- The amount or dose (the amount or level of a chemical a person was exposed
- The duration (how long did exposure occur); and
- The frequency (how many times the person was exposed).

3.3. Direct impact on humans

The high risk groups exposed to pesticides include

- Production workers
- Formulators
- Sprayers
- Mixers
- Loaders and agricultural farm workers.

During manufacture and formulation, the possibility of hazards may be higher because the processes involved are not risk free. In industrial settings, workers are at increased

risk since they handle various toxic chemicals including pesticides, raw materials, toxic solvents and inert carriers.

3.4. Impact on environment

Pesticides can contaminate

- Soil
- Water, grass, and other
- Vegetation.

In addition to killing insects or weeds, pesticides can be toxic to a host of other organisms including birds, fish, beneficial insects, and non-target plants. Insecticides are generally the most acutely toxic class of pesticides, but herbicides can also pose risks to non-target organisms.

Self-Check: Written Exam

Name: ----------Date: ----------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List the impact of chemicals on environment (2pts)

Note: Satisfactory rating –2 points Unsatisfactory - below 2points

Information sheet 4: Cleaning equipment and worksite and disposing waste

5.1 Introduction

Cleaning Equipment**:** It is the standard operating procedure to clean and sterilize instruments and equipment in the following manner:

General Requirements: Instrument cleaning is to begin immediately after the work procedure is complete.

- **Rinse** heavily soiled instruments under cool or lukewarm (not hot) running water for several minutes to remove most blood and tissue residue. Do not use hot water; this causes coagulation of proteins in blood, making it more difficult to remove.
- **Soak** instruments in distilled water. Instruments should be fully submerged for at least 10 minutes. dish soap or other common household cleaners, they can damage instrument surfaces and promote corrosion!)
- **Thoroughly clean instruments** in all cracks and crevices. Use a nylon bristle brush to clean hard to reach places without scratching or harming delicate instrument surfaces. Use the stainless steel bristle brush when cleaning rasps, files and burs. Disassemble all instruments with multiple components, ie. Poole suction tip, depth gauge.
- **Rinse instruments** with fresh distilled water
- **Place the instruments** in their open position into the ultrasonic cleaner for 10 minutes. Do not combine German made instruments along with Pakistan, they are made of lower grade metals and can damage the German instruments.
- **Rinse instruments** with distilled water once again after the ultrasonic cycle
- If time allows, towel dry with lint free surgical towel or place neatly to air dry. Towel drying minimizes the risk of corrosion and formation of water spots.
- **Spray** the instruments with lubricating “milk” and allow to air dry
- **Carefully inspect instruments** for defects and stains. Use the Surgical Instrument stain remover when needed.

5.2. Cleaning Work site

Effective cleaning management systems need suitable cleaning methods, schedules, equipment, trained cleaners and reliable communication and consultation.

- **Assess the risk**
  - ✓ Floors are not fully dry and can be accessed
  - ✓ spills and contaminants are left unattended
  - ✓ a build-up of cleaning product residues (reduces slip resistance)
  - ✓ cleaning equipment and cords left across walkways
  - ✓ cleaning is ad hoc, unplanned and reactive
  - ✓ poor, inappropriate or dirty cleaning equipment used
  - ✓ Incorrect cleaning products and procedures.

5.3. Cleaning methods:

- leave a clean and dry surface, free from moisture or dry waste – e.g. 'clean-to-dry'
- do not leave a build-up of cleaning products
- maintain the slip resistant properties of the floor/surface (if non-slip flooring)
- are based on advice from the flooring supplier
- are tailored to the specific flooring and contaminants – i.e. type and concentration of chemicals etc. For example, the time detergent is on the floor has been shown to have a significant effect on cleanliness. It is also noted that flooring that is slip resistant can be cleaned to be as hygienic as other flooring.

5.4. Cleaning schedules:

- are systematic and well planned
- have routine daily cleaning conducted during quiet/slow periods
- include periodic deep/comprehensive cleaning
- provide a rapid/urgent response to spills
- include indoor and outdoor areas
- include customer/visitor areas
- Accommodate for periods of bad weather.

5.5. Cleaning equipment/products:

- suited to the task, environment and the users
- Don’t spread the problem (e.g. paper-towel instead of wet mop for small spill, or 'spill-kit' materials for oil leaks, spill stations where resources are kept etc.)
- Includes barriers and signs to keep people off any wet areas if 'clean-to-dry' is not possible.

5.6. Personnel responsible for cleaning:

- cleaners are trained, equipped and supervised to do routine cleaning
- all workers assist in spot cleaning/spills management
- supervisors are trained and able to oversee work practices
- Workplace visitors and others encouraged to report hazards where appropriate.

Details regarding the correct cleaning system may be provided in a Safe Work Method Statement or other procedural guidance.

5.7. Disposing waste

Waste disposal is an activity that is directly responsible for much environmental damage, and locating waste disposal sites, determining what waste materials were disposed of through time and exactly where, and determining ownership and whether disposal methods were proper or improper are important issues in environmental litigation.

5.7.1. Types of Medical Waste

- **Infectious Waste** - these come from hospital labs that potentially contain infectious diseases.
- **Pharmaceutical Waste** - aside from expired pills, antibiotics, and drugs of the sort, this also applies to expired and dainted vaccines.
- **Radioactive Waste** - usually, this type of waste comes from radiotherapy liquid. So, anything that comes in contact with this type of liquid should be thrown out.
- **Pathological Waste** - any form of contaminated human or animal body parts, such as tissues, body parts, organs, or bodily fluids.
- **Contaminated Sharps/Needles** - this specific type of waste is from any sharp object that can pierce the skin and used in operations.

- **Isolation Waste** - these come from those hospitalized patients that were isolated to protect others from their communicable disease.
- **Blood Products** - wasted serum, blood, and plasma**.**

Various Methods of Waste Disposal

- **Landfills** This process of waste disposal focuses attention on burying the waste in the land. Landfills are commonly found in developing countries.
- **Recycling:** Recycling is the process of converting waste products into new products to prevent energy usage and consumption of fresh raw materials. Recycling is the third component of Reduce, Reuse and Recycle waste hierarchy
- **Composting:** Composting is an easy and natural bio-degradation process that takes organic wastes i.e. remains of plants and garden and kitchen waste and turns into nutrient-rich food for your plants.
- **Burning:** waste is usually **an environmentally poor waste management option because potential resources are lost** and it can cause air, land and water pollution. ... In some cases, burning waste is forbidden. This guide is for any business that burns waste for disposal or to generate energy.
- **Incineration:** The **waste treatment process that involves the combustion of organic substances contained in waste materials** is known as Incineration. Incineration of waste materials converts the waste into ash, flue gas and heat.
- **Bury:** Buried waste is also material that has been disposed of in the ground but is not as large or regulated as a landfill. A good portion of waste materials can break down in the ground but some can be harmful**.**

Self-Check: Written Exam

Name: ----------Date: ----------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why it's important disinfection and sterilization (2pts)
2. Explain waste disposal methods (3pts)

Note: Satisfactory rating –5 points Unsatisfactory - below 5points

Information sheet 5: Storing health treatment

5.1. Introduction

Drugs are to be stored at proper temperatures. Drugs requiring storage at room temperatures are to be stored at a temperature of not less than 15 C (36F) or more than 8 C (46F). A medication requiring storage in a cool place may be stored in the refrigerator

5.2. Guidelines for the Storage (General Requirements)

- All personnel should receive proper training in relation to good storage practice, regulations, procedures and safety.
- Individual responsibilities should be clearly defined and understood by the individuals concerned and recorded as written job descriptions. Certain activities may require special attention such as the supervision of performance of activities, in accordance with these guidelines.
- Storage areas should be designed or adapted to ensure good storage conditions. In particular, they should be clean and dry and maintained within acceptable temperature limits. Where special storage conditions are required on the label (e.g. temperature, relative humidity) these should be provided, checked and monitored and recorded.
- Medicines and health commodities should be stored off the floor and suitably spaced to permit cleaning and inspection. Storage area should be appropriated in a way that not more than 60% of their space is utilized**.**
- Rejected materials and pharmaceutical products should be identified and controlled under a quarantine system designed to prevent to their use until a final decision is taken on their fate.
- Broken or damaged items should be withdrawn from usable stock and separated.
- Pharmaceutical products should be transported in such a way that their integrity is not impaired and that storage conditions are maintained.
- Chief of drug Store should conduct a regular shelf-inspection using the checklist

5.3. Routine Management or Storeroom Management Tasks

Daily/Weekly

- Monitor storage conditions
- Record temperature and humidity

- Sweep or scrub floors
- Remove garbage
- Ensure adequate ventilation and cooling
- Ensure that products are protected from direct sunlight
- Monitor store security and safety
- Check the store roof for leaks, especially during the rainy season
- Monitor product quality
- Ensure that products are stacked correctly
- Update stock records and maintain files
- Monitor stock levels, stock quantities, and safety stocks
- Submit emergency order (as needed, using local guidelines)
- Update back-up file for computerized inventory control records
- Update bin cards
- Separate expired stocks and move to secure area

Monthly

- Update stock card
- Conduct physical inventory or cycle count, and update stock keeping records
- Run generator to ensure the system is working correctly; check the level of fuel and add fuel, if needed.
- Inspect the storage structure for damage, including the walls, floors, roof, windows and doors

5.4. Common storage temperatures

Store frozen: Some products, such as certain vaccines, need to be transported within a cold chain and stored at -20˚C (4˚F). Frozen storage is normally for longer-term storage at higher-level facilities.

Store at 2˚- 8˚C (36˚-46˚F): some products are very heat sensitive but must not be frozen. These are usually kept in the first and second part of the refrigerator (never the freezer). This temperature is appropriate for storing vaccines for a short period of time.

Keep cool: store between 8˚-15˚C (45˚-59˚F).

Store at ambient temperature: Store at the surrounding temperature. This term is not widely used due to significant variation in ambient temperatures. It means “room temperature” or normal storage conditions, which means storage in a dry, clean, well-ventilated area at room temperatures between 15˚C to 25˚C (59˚-77˚F) or up to 30 ˚C, depending on climatic conditions.

Self-Check: Written Exam

Name: ----------Date: ----------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why store drugs and write the normal storage temperature (2pts)

Note: Satisfactory rating –2 points Unsatisfactory - below 2points

Information sheet 6: Documenting relevant information.

6.1. Introduction

Documentation is an essential component of effective healthcare communication. Given the complexity of healthcare and the fluidity of clinical teams, healthcare records are one

of the most important information sources available to clinicians. Good documentation contributes to better patient outcomes by enabling information exchange and continuity of care by all members of the healthcare team

Clinical documentation is information that is recorded about a person's care. The primary purpose of clinical documentation is to facilitate safe, high-quality and continuous care.

6.2. Type of documentation

6.2.1. Clinical documents

Clinical documents can take on a number of forms and be paper-based, electronic or a mix of both. These documents include treatment and observation notes, care plans, correspondence, test results, x-rays, clinical photos, medication charts, checklists, operation reports, transfer forms, clinical summaries and information from specialists, community workers or general practitioners.

6.2.2. Healthcare record

The primary place for clinical information to be documented is in the healthcare record. The healthcare record can be made up of a number of different clinical documents, and is the place in which all relevant clinical information about a patient is stored. This includes information about the patient's medical and social history, about the progress and health outcomes of each intervention or interaction, and information from owner

Documentation needs to be an accurate reflection of clinical events and clinician decision making for classification (coding) purposes as well as a method of communication to facilitate continuity of care.

6.2.3. The Importance of documentation

Documentation of information, which is accurate, current, relevant, available and accessible, supports clinicians to deliver safe, high-quality care by ensuring they have correct information to:

- Make safe clinical decisions

- Effectively communicate across transitions with other healthcare providers and across multidisciplinary teams
- Maintain effective continuity of care
- Effectively communicate and partner with patients.

6.2.4. Key messages

- Poor documentation is a key safety and quality risk, particularly at transitions of care where there is a higher risk of information being miscommunicated or lost
- Documentation of clinical information is an essential component of clinical communication and integral to supporting the delivery of safe, high-quality and continuous patient care
- High-quality documentation is person-centered, relevant, accurate, complete, up to date and accessible to all members of the healthcare team
- High-quality documentation is the responsibility of all health professionals involved in the provision of care
- Consider documentation requirements at all stages of care delivery.

Self-Check: Written Exam

Name: ----------Date: ----------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List type of documentation and explain each of them (4pts)

Note: Satisfactory rating –4 points Unsatisfactory - below 4points

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