ANIMAL HEALTH CARE SERVICE

NTQF LEVEL -II

LEARNING GUIDE

UNIT OF COMPETENCE: - ASSIST GENERAL ANIMAL HEALTH CARE

MODULE TITLE: ASSISTING GENERAL ANIMAL HEALTH CARE

OCTOBER, 2019

BAHIR DAR, ETHIOPIA

ANIMAL HEALTH CARE SERVICE

NTQF Level -II

Learning Guide -1

Unit of Competence: - Assist General Animal Health care

Module Title: Assisting General Animal Health Care

LG Code: AGR AHC2 M14 LO1-LG-01

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LO 1: Develop knowledge of basic concepts in disease causing agents

Instruction Sheet	Learning Guide #1

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

- Categorize disease causing agents
- Presence of disease causative agents
- Pathogenic microorganisms
- Infection and infestation
- Method of disease transmission
- Disease causing agents with zoonotic nature

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Categorize disease causing agents based on their nature and source of infection and infestation.
- Describe transmission ways of disease causing agents in line with route of transmission.
- Identify disease causing agents with zoonotic nature.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 5.
3. Read the information written in the information “Sheets 1, sheet 2, sheet 3, sheet 4, sheet 5 and sheet 6”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1 Self-check 2, Self-check 3 Self-check 4, Self-check 5 and Self-check 6” **in page 6, 8, 17, 19, 22 and 26** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “LO2” in page **28**.

Information Sheet-1	Categorize disease causing agents

1.1. Definitions

A **disease** is an abnormal condition that is caused by infection, basic weaknesses, or environmental stress, “dis-ease” means literally a departure from a state of ease. A disease is defined by a specific group of signs or symptoms. Diseases prevent affected animals from functioning normally.

Health is the overall condition of an animal at a given time.

A **pathogen** is a microorganism that produces disease.

The **host** is the person or animal infected by the pathogen.

Etiology: - study of disease causes.

A **microorganism** is a living organism of microscopic dimensions.

Infectious agents, commonly referred to as “germs,” move from one susceptible animal to another in order to survive.

1.2. Types of diseases

Diseases can be categorized by common causes, such as genetic, mechanical, toxic, and nutritional. Infectious diseases are caused by viruses, bacteria, and fungi. Parasitic diseases are caused by protozoa, worms, and external parasites such as mites and lice.

Diseases can be classified according to two major dimensions, namely the time course and cause.

- According to the time course, they are further classified as acute (characterized by a rapid onset and a short duration), and chronic disease (characterized by prolonged duration).
- Based on the cause, diseases can be broadly categorized as infectious, (i.e. caused by living parasitic organisms such as viruses, bacteria, parasitic worms, insects, etc.), or as noninfectious (which are caused by something other than a living parasitic organism).

There are different types of diseases, depending on how they are spread and what causes them.

Types of diseases include the following:

Contagious disease = disease that can be spread from one animal to another by direct or indirect contact. Contagious disease also may be referred to as communicable

- **Iatrogenic disease** = disorder caused by physicians or veterinarians (and the treatment ordered).
- **Idiopathic disease** = disorder of unknown cause. Idiopathic disease is a disease peculiar to an individual and not likely to be seen in others.
- **Infectious disease** = disorder caused by pathogenic organisms.
- **Noncontagious** = disease that cannot be spread to another animal by contact or contact with a contaminated object.
- **Noninfectious disease** = disorder not caused by organisms (examples include genetic, traumatic, and iatrogenic).
- **Nosocomial infection**= disorder caused by pathogenic organisms contracted in a facility or clinic.

Self-Check -1	Written Test

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

1. Define the following terms (**1pointst each**).
   A. Disease
   B. Health
   C. Microorganism
   D. Infectious agents
2. List types of disease(7pts)

Note: **Satisfactory rating - 11points** **Unsatisfactory - below 11 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-2	Presence of disease causative agents

2.1. Primary versus opportunistic pathogens

Among the many varieties of microorganisms, relatively few cause disease in otherwise healthy individuals. Infectious disease results from the interplay between those few pathogens and the defenses of the hosts they infect. The appearance and severity of disease resulting from any pathogen, depends upon the ability of that pathogen to damage the host as well as the ability of the host to resist the pathogen. However a host's immune system can also cause damage to the host itself in an attempt to control the infection. Clinicians therefore classify infectious microorganisms or microbes according to the status of host defenses - either as primary pathogens or as opportunistic pathogens:

Primary pathogens

Primary pathogens cause disease as a result of their presence or activity within the normal, healthy host, and their intrinsic virulence (the severity of the disease they cause) is, in part, a necessary consequence of their need to reproduce and spread.

Opportunistic pathogens

Opportunistic pathogens can cause an infectious disease in a host with depressed resistance or if they have unusual access to the inside of the body. Opportunistic infection may be caused by microbes ordinarily in contact with the host, such as pathogenic bacteria or fungi in the gastrointestinal or the upper respiratory tract, and they may also result from microbes acquired from other hosts or from the environment as a result of traumatic introduction. An opportunistic disease requires impairment of host defenses, which may occur as a result of genetic defects, exposure to antimicrobial drugs or immunosuppressive chemicals, exposure to ionizing radiation, or as a result of an infectious disease with immunosuppressive activity. Primary pathogens may also cause more severe disease in a host with depressed resistance than would normally occur in an immunosufficient host.

Self-Check -2	Written Test

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

1. What is the difference between primary and opportunistic pathogens? (**4point**)
2. How microbes cause opportunistic infection?(**6points**)

Note: **Satisfactory rating -10 points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-3	Pathogenic microorganisms

3.1. Pathogenic organisms

Pathogenic microorganisms comprising external and internal parasites, fungal, viral, protozoal, bacterial posing effect on health of animals. Microbes are called **disease-causing** microbes and can make humans, animals and plants sick by causing infection and disease. Disease-causing microbes can also be called **pathogens**, germs or bugs and are responsible for causing infectious diseases. Microorganisms are very diverse. They include all of the **prokaryotes**, namely the bacteria and archaea and various forms of **eukaryotes**, comprising the protozoa, fungi, algae, microscopic plants (green algae), and animals such as rotifers and planarians. Some microbiologists also classify viruses as microorganisms, but others consider these as nonliving.

3.1.1. External and internal parasites

Parasite is an organism that lives on or in another living organism. **Ectoparasites** are organisms which inhabit the skin or outgrowths of the skin of another organism (the host) for various periods. Various ectoparasites cause significant infestations in many kinds of domestic animals. External parasites include blowflies, lice, mites, tick, leeches and sheep ked. With few exceptions, the external parasites are **insects** or forms related to insects.

Parasites that attack livestock and poultry may live in the digestive tract, the liver, the lungs, the kidneys, and elsewhere in the body are called **internal parasites**. Most of the internal parasites are either microscopic organisms known as **protozoa** or belong to a group of larger parasites known collectively as **worms**.

There are several different internal parasite species that impact animals. For example **Nematodes** include *Haemonchus contortus, Ostertagia circumcincta, Trichostrongylus axei, T. colubriformis, T. vitrinus and T. capricola, Cooperia curticei, Nematodirus spathiger and N. filicollis, Trichuris ovis, Oesophagostomum venulosum, Chabertia ovina, Dictyocaulus filarial* and *Muellerius capillaris*. There are also: **Trematodes**, like liver fluke, and **Cestodes**, also called **tapeworms**.

Each species affects herds differently based on **climate**, **nutrition**, **immune status, rainfall**, and **conditions** (e.g., overcrowding and overgrazing, which increase the harmfulness).

Animals infected with an average number of worms can reduce weight gains by **10 to 20** percent. The economic losses are greatest in growing calves, yet the sheep and goat industry is severely threatened by barber pole worms because they are resistant to almost every available de-wormer. These infections cause severe **blood loss**, **resulting in death loss** on many farms. Treatment is difficult after the sheep or goats have become anemic (a deficiency in red blood cells).

3.1.2. Fungus

A fungus is a member of a large group of **eukaryotic** organisms that includes microorganisms such as **yeasts** and **molds**, as well as the more familiar **mushrooms**. A fungus is actually a primitive plant. Fungi can be found in air, in soil, on plants, and in water. The most familiar ones to us are mushrooms, yeast, mold, and mildew. Fungal diseases are called mycoses. Mycoses can affect skin, nails, body hair, internal organs such as lungs, and body systems such as nervous system. Aspergillus fumigatus fungi, for example, can cause aspergillosis, a lung disease. Many types of fungi exist and cause problems in humans, animals and plants.

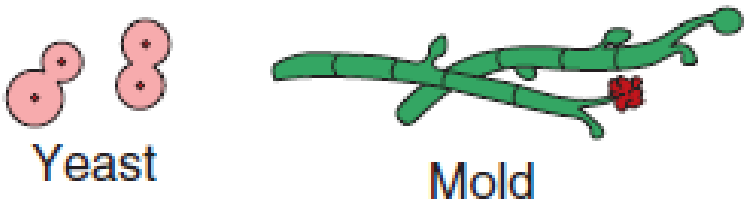


Figure 1: Structure of fungus- yeast is a budding form of fungus whereas mold is a filamentous form of fungi.

Diseases caused by fungi

- Aspergillosis- Aspergillus spp, especially A. fumigatus
- Dermatophytosis(ringworm)- by the fungal genera *Microsporum* and *Trichophyton*
- Mycotic Pneumonia - Cryptococcus, Histoplasma, Coccidioides, Blastomyces, and Aspergillus spp
- Epizootic Lymphangitis: - by the dimorphic fungus *Histoplasma capsulatum var. farciminosum.*

3.1.3. Protozoa

Protozoa are **single-celled** eukaryotes (organisms whose cells have nuclei) that commonly show characteristics usually associated with animals, most notably mobility and heterotrophy. Protozoa are microscopic unicellular eukaryotes that have a relatively complex internal structure and they have structure for propulsion or other types of movements. Shapes of protozoa are mainly Ciliate, amoebae and flagellates. Protozoa are a group of microscopic one-celled animals. Protozoa can be parasites or predators. Examples diseases Caused by Protozoa are:- Babesiosis, Trichomoniasis, Toxoplasmosis, Trypanosomosis etc.

Examples of Protozoa and diseases

Trypanosoma species: - The genus *Trypanosoma* is large and diverse. It includes several species that infect wild and domesticated animals in Africa, particularly hoofed animals, and humans.

Trypanosoma equiperdum

Disease: Trypanosomiasis (equine), dourine, equine syphilis, maladie du coit.

Host: Horse, ass. Several small laboratory animals are susceptible.

Habitat: Found in vaginal or preputial discharges or in the serous fluid from urticarial plaques and edematous swellings. It is a tissue parasite and rarely invades the blood.

Trypanosoma theileri (syn. americanum}, T. melophagium

Disease: Trypanosomiasis (nonpathogenic form).

Host: T. theileri: cattle. T. melophagium: sheep.

Habitat: Blood, tissues.

Babesia bigemina:-

Disease: Babesiosis (bovine), Texas fever, red water fever, piroplasmosis.

Host: Cattle, deer.

Habitat: Erythrocyte

Babesia equi

Disease: Babesiosis (equine).

Host: Horse, mule, donkey.

Habitat: Erythrocyte.

Identification: Trophozoites may be round, ameboid, or pyriform. Four organisms may be joined, giving the effect of a Maltese cross. Individual organisms are 2-3 ju long.

Eimeria necatrix, E. acervulina, E. maxima, E. mitts, E. praecox, E. hagani, E. mivati, E. brunetti (coccidia)

Disease: Avian Coccidiosis, intestinal Coccidiosis.

Host: Chicken.

Habitat: *E. necatrix* is usually located in the anterior or midportion of the gut. *E. brunetti* is found in the lower small intestine, rectum, cecum, or cloaca. *E. acervulina, E. mivati, E. hagani, E. mitis*, and *E. praecox* are all found in the upper half of the small intestine.

***Theileria parva*, Theileria species. (U.S.)**

Disease: Theileriosis (bovine), East Coast fever.

Host: Cattle, water buffalo, white-tailed deer (U.S.).

Habitat: Erythrocytes, lymphocytes, histiocytes, and occasionally endothelial cells.

Identification: Form seen in the erythrocyte may be rod-like, oval, or commashaped. They are 0.5-2.0ju. Several parasites may be seen in a single host cell. Multiplication occurs chiefly in the lymphocytes but also in endothelial cells. Multiplying forms may also be found in lymph nodes and the spleen where they are known as Koch's bodies, which may be 12 μ in diameter.

Toxoplasma gondii

Disease: Toxoplasmosis.

Host: First reported from the gondi, a north African rodent; now reported from a wide range of mammals, birds, and man.

Habitat: A parasite found in many cell types such as neurons, endothelium, reticulum, liver parenchyma, cardiac, and muscle cells. It may also be free in the blood and peritoneal exudate.

Identification: Trophozoites are crescent-shaped or banana-shaped and about 6 x 3 μ with a round nucleus as large as 2 μ in diameter. The oocyst stage, seen only in cat feces to date, is indistinguishable from the oocysts of Isospora bigemina. Before sporulation T. gondii oocysts are spherical with a mean size of 12.5 x 11.0 μ. This organism is now considered to be a coccidium.

***Tritrichomonas foetus* (flagellate)**

Disease: Tritrichomoniasis (bovine).

Host: Cattle possibly pig.

Habitat: Preferred location in the bull is the preputial cavity. In the cow the protozoan may be found throughout the genital tract.

Identification: Spindle to pear-shaped and up to 25 µ long by 3-15 µ wide. Actively motile showing a vigorous, jerky motion of no particular pattern. Four anterior flagella are present, and one of these extends posteriorly along the edge of the undulating membrane and posteriorly as a free flagellum.

3.1.4. Virus

Viruses have regular and geometric shapes. A **virus** is a simple organism which does not display all the characteristics of living things. Viruses are made up of a protein coating and some genetic material. Viruses can only grow and reproduce within other living things. Viruses are transmitted as organisms much smaller than bacteria and incapable of multiplying outside the host, but often associated with larger particles in the water environment. A virus is an obligate intracellular parasite (meaning that it must exist within the cells of its host in order to replicate). A virus is metabolically inert outside a cell. Viruses are not living cells. They cannot provide their own nutrition, nor can they replicate on their own. Viruses have no organized cellular structures but simply a protein coat, called the **capsid**, surrounding a nucleic acid core, called a **genome**, of either RNA or DNA, but never both. The capsid together with the genome is called the **nucleocapsid**. The nucleocapsid may be surrounded by an envelope that is composed of a lipid bilayer containing protein spikes. An entire virus particle is called a virion. Viruses are classified by the categories: DNA or RNA; single strand or double strand; enveloped or non-enveloped.

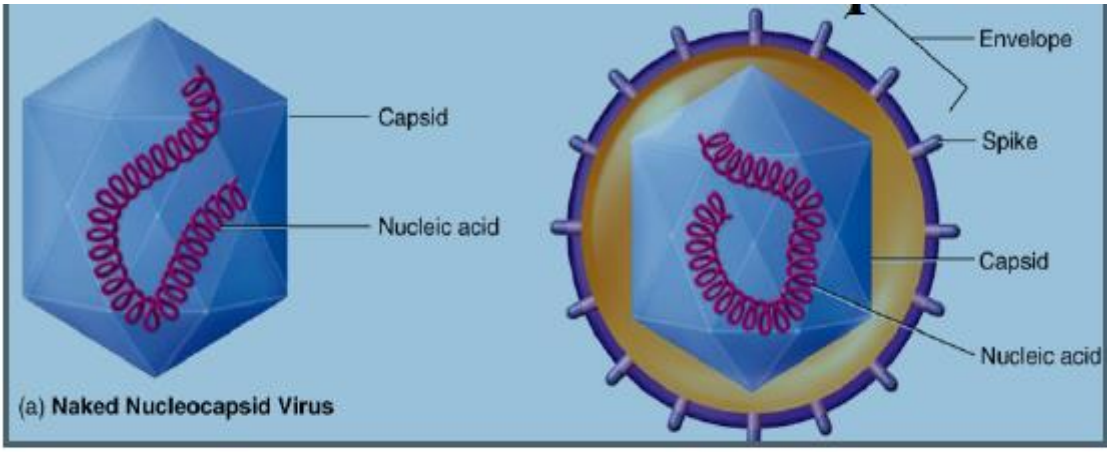


Figure 2: General Structure of Viruses.

Diseases caused by virus:

- Lumpy Skin Disease:- by LSD virus , genus *Capripoxvirus*
- Foot and Mouth Disease:- by FMD virus

- Malignant Catarrhal Fever:- by a *lymphotropic herpesvirus*
- Pest des Petits Ruminastms (PPR):- by Pest des Petits Ruminastm virus
- Rabies:- by rabies virus, the genus *Lyssavirus*
- Rift Valley Fever:- by RVF virus in the *phlebovirus* genus
- Rinderpest:- by rinderpest virus (RPV)
- Sheep and Goat Pox (SGP):- by SGP virus ,the genus *capripoxvirus*
- African Horse Sickness:- by a double stranded RNA virus ,*Genus Orbivirus*

3.1.5. Bacteria

Bacteria are often dismissed as “germs” that cause illness. Bacteria are also considered as single-celled microscopic organisms, which do not completely have a **nucleus**. Bacteria help us in doing an amazing array of useful things, like making vitamins, breaking down of some types of garbage, and maintaining the atmosphere. They “eat” everything from sugar & starch to sunlight, sulfur, Iron. Some bacteria cause disease, but many are useful. Bacteria reproduce very quickly. Two can very quickly become four, then eight and so on. They also constitute a large domain of **prokaryotic** microorganisms. Microbes belonging to the bacteria group are made up of only one cell. Bacteria look like balls, rods, or spirals when visualized under a microscope. Bacteria are the smallest and the most numerous organisms. Bacterial cell structure is more complex. It has a secondary membrane like covering outside of their cell wall. It also exhibit considerable diversity in both structure and metabolism. Bacteria multiply rapidly by simple cell division and absorb nutrients from their immediate environment. Bacteria (singular bacterium) are autonomously replicating unicellular organisms lacking both an organized nucleus (which defines the class of cells called prokaryotes) and organized intracellular organelles. They have only a **single** circular chromosome of double-stranded **DNA** (dsDNA), some extra chromosomal DNA, and most have a cell wall containing the polymer peptidoglycan.

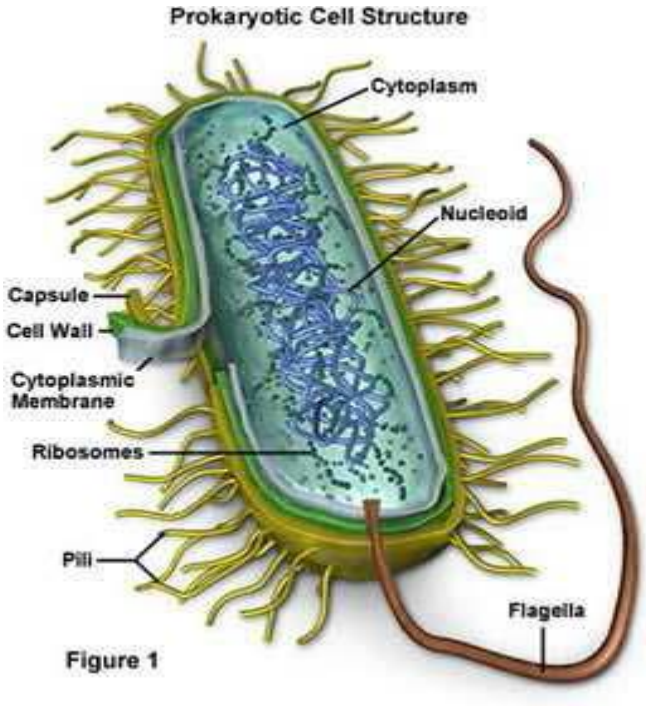


Figure 3: Prokaryotic cell structure.

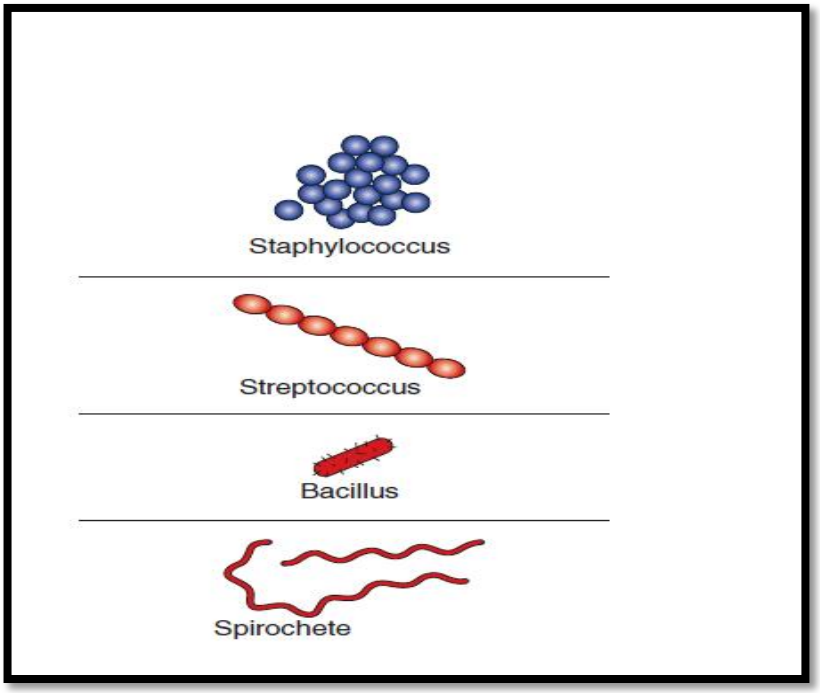


Figure 4: Morphology of bacteria. Staphylococci are grapelike clusters of spherical bacteria; coccus means sphere. Streptococci are spherical bacteria that form chains. Bacilli are rod-shaped bacteria. Spirochetes are spiral shaped bacteria that are tightly coiled.

Diseases caused by bacteria

- Actinobacillosis (wooden tongue):-by *A. lignieresii*.
- Actinomycosis(lumpy jaw):- by *Actinomyces bovis*

- Anthrax:- by *Bacillus anthracis*
- Bacillary Hemoglobinuria:- by *Clostridium haemolyticum*
- Blackleg:- by *Clostridium chauvoei*
- Botulism:- by ingestion of preformed toxin of *Clostridium botulinum*
- Campylobacteriosis :- by *Campylobacter species*
- Dermatophilosis:-by *Dermtophilus congolensis*
- Leptospirosis:- by *Leptospira interrogans serovars*
- Listeriosis :-by *Listeria monocytogenes*
- Hemorrhagic Septicemia:- by particular serotypes of *Pasteurella multocida*
- Salmonellosis:- by many species of *salmonellae*
- Tetanus:- by a specific neurotoxin produced by *Clostridium tetani*
- Tuberculosis: - by acid-fast bacilli of the genus *Mycobacterium*

Self-Check -3	Written Test

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

1. What dose pathogenic organisms mean?(**1point**)
2. Explain the following terms(**4points**)
    A. Fungus
    B. Parasites
    C. Virus
    D. Bacteria
3. Give three examples of diseases caused by:- (**8points**)
    A. Fungus
    B. Parasites
    C. Virus
    D. Bacteria

Note: **Satisfactory rating - 13 points** **Unsatisfactory - below 13 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-4	Infection and infestation

4.1. Infection

Infection is the invasion of an organism's body tissues by disease-causing agents, their multiplication, and the reaction of host tissues to the infectious agents and the toxins they produce. Infectious disease, also known as transmissible disease or communicable disease is illness resulting from an infection. Infections are caused by infectious agents (pathogens). Infection means the entry and development or multiplication of a pathogenic agent in the body of humans or animals.

4.2. Infestation

Infestation means the external invasion or colonisation of animals or their immediate surroundings by arthropods, which may cause clinical signs or are potential vectors of pathogenic agents.

Self-Check -4	Written Test

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

1. Write the difference between infection and infestation.(**4points**)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-5	Method of disease transmission

5.1. Sources

Animals can be exposed to diseases from a variety of sources. Most occur between animals, but transfer can also occur from the environment, such as soil, water, or feed. Some diseases can also be transferred between animals and people. Diseases of animals transferred to people are referred to as zoonotic diseases, while diseases of humans transferred to animals are referred to as reverse zoonoses.

5.2. Routes of Transmission

Animal diseases can be spread by 5 main routes of transmission: direct contact; inhalation of aerosols; ingestion; indirect transfer by fomites, such as equipment, footwear or vehicles; or vector transmission.

5.2.1. Direct transmission

Direct contact is one of the main methods of disease spread between animals. It occurs when a susceptible animal comes in direct contact with an infected animal, its body fluids or tissues. Depending on the microorganism, it may be transferred directly by blood, saliva, urine, or feces. It may also be spread through contact with infected animal lesions or tissues. Entry into the susceptible animal generally occurs through contact with the mucous membranes, such as the eyes, nose, or mouth but can also enter through open wounds or breaks in the skin. So, possible exposures can occur from nose-to-nose contact, biting or rubbing against each other. Some diseases of animals can also be spread during breeding as well as from mother-to-offspring, during gestation or through milk when nursing.

5.2.2. Aerosol Transmission

Aerosol transmission is another means of disease spread. This involves the transfer of disease agents in droplets spread through the air, which are then inhaled by another animal. Most microorganisms are not able to survive for extended periods of time within the aerosol droplets, and as a result, close proximity of infected and susceptible animals is required for disease transmission. Aerosol transmission can also occur when infected droplets from urine, feces, or birthing material get stirred up from contaminated soil or dust and inhaled.

5.2.3. Oral transmission

Oral transmission of disease causing organisms involves ingestion through the consumption of contaminated feed or water, or by licking/chewing on contaminated environmental objects. Feed and water contaminated with feces, urine or saliva are frequently the cause of oral transmission of disease agents. Fecal-oral transmission of diseases is a common means of infection in animals (and people). Shared feed and water sources can contribute to the spread of the disease.

5.2.4. Fomite transmission

Indirect transmission may occur by fomites. These are inanimate objects, such as equipment, clothing, footwear or vehicles that can transfer microorganisms from an infected animal to another animal or person. Examples of fomites that may be present during a response include needles, balling guns (used to dispense medication to cattle), feed or water buckets, bedding and shovels. Even items such as clothing or vehicles may become contaminated and serve to spread pathogens.

5.2.5. Vector transmission

Some diseases are spread by vectors living organisms able to transfer microorganisms from an infected animal to another. Mosquitoes, ticks, biting midges and flies are common disease carrying vectors, but sometimes rodents or birds can serve as disease vectors.

Self-Check -5	Written Test

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

1. Which one is source of infection?(**2points**)
   A. Animal
   B. Environment
   C. People
   D. All
2. Write routes (methods) of animal diseases transmission. (5points)

Note: **Satisfactory rating - 6points** **Unsatisfactory - below 6 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-6	Disease causing agents with zoonotic nature

6.1. Zoonotic diseases

Zoonotic diseases are caused by a diverse group of pathogens that are transmissible from animals to humans. A zoonosis is any disease or infection that is naturally transmissible from vertebrate animals to humans. Animals thus play an essential role in maintaining zoonotic infections in nature. Zoonoses may be bacterial, viral, or parasitic, or may involve unconventional agents. As well as being a public health problem, many of the major zoonotic diseases prevent the efficient production of food of animal origin and create obstacles to international trade in animal products.

6.2. Types

The types of zoonosis include those caused by:

- A virus:-eg. Pox viruses, Ebola Virus, Lyssa virus (Rabies), avian influenza virus.
- Bacteria:-eg. Leptospira interrogans, Campylobacter jejuni and C. coli, Salmonella spp., Brucella canis, Bacillus anthracis(Anthrax),
- Fungus:-eg. Candida albicans, Microsporum canis(ringworm)
- Parasites:-eg. Echinococcus granulosus,
- Rickettsia:-eg. Coxiella burnetti (Q fever),
- Protozoan:- Toxoplasma gondii, Cryptosporidium parvum,

Zoonotic diseases spread by mosquitos and ticks are some of the most serious of these diseases.

Table 1: Lists of zoonotic diseases

Disease	Pathogen(s)	Animals involved	Mode of transmission
African sleeping sickness	*Trypanosoma brucei rhodesiense*	range of wild animals and domestic livestock	transmitted by the bite of the tsetse fly
Anthrax	*Bacillus anthracis*	commonly – grazing herbivores such as cattle, sheep, goats, camels, horses, and pigs	by ingestion, inhalation or skin contact of spores
Babesiosis	*Babesia* spp.	mice, other animals	tick bite
Bird flu	Influenza A virus subtype H5N1	wild birds, domesticated birds such as chickens	close contact
Bovine spongiform encephalopathy	Prions	Cattle	eating infected meat
Brucellosis	*Brucella* spp.	cattle, goats	infected milk or meat
Cat-scratch disease	*Bartonella henselae*	Cats	bites or scratches from infected cats
Cryptosporidiosi	*Cryptosporidium* spp.	cattle, dogs, cats, mice, pigs,	ingesting cysts from

s		horses, deer, sheep, goats, rabbits, leopard geckos, birds	water contaminated with feces
Cysticercosis and taeniasis	*Taenia solium*, *Taenia asiatica*, *Taenia saginata*	commonly – pigs and cattle	consuming water, soil or food contaminated with the tapeworm eggs (cysticercosis) or raw or undercooked pork contaminated with the cysticerci (taeniasis)
Ebola virus disease	*Ebolavirus* spp.	chimpanzees, gorillas, fruit bats, monkeys, shrews, forest antelope and porcupines	through body fluids, organs and ticks
Echinococcosis	*Echinococcus* spp.	commonly – dogs, foxes, jackals, wolves, coyotes, sheep, pigs, rodents	ingestion of infective eggs from contaminated food or water with feces of an infected, definitive host and/or fur
Fasciolosis	*Fasciola hepatica*, *Fasciola gigantica*	sheep, cattle, buffaloes	ingesting contaminated plants
Foodborne illnesses (commonly diarrheal diseases)	*Campylobacter* spp., *Escherichiacoli*, *Salmonella* spp., *Listeria* spp., *Shigella* spp. and *Trichinella* spp.	animals domesticated for food production (cattle, poultry)	raw and/or undercooked food made from animals and unwashed vegetables contaminated with feces
Giardiasis	*Giardia lamblia*	beavers, other rodents, raccoons, deer, cattle, goats, sheep, dogs, cats	ingesting spores and cysts in food and water contaminated with feces
Glanders	*Burkholderia mallei.*	horses, donkeys	direct contact
Henipavirus	*Henipavirus* spp.	horses, bats	exposure to feces, urine, saliva or contact with sick horses
Influenza	*Influenza A virus*	horses, pigs, domestic and wild birds, wild aquatic mammals such as seals and whales, minks and farmed carnivores	droplets transmitted through air
Leishmaniasis	*Leishmania* spp.	dogs, rodents, other animals	sandfly bite
Leprosy	*Mycobacterium leprae*, *Mycobacterium lepromatosis*	armadillos, monkeys, rabbits, mice	direct contact, including meat consumption. However, scientists believe most infections are spread human to human.
Leptospirosis	*Leptospira interrogans*	rats, mice, pigs, horses, goats, sheep, cattle, buffaloes, opossums, raccoons, mongooses, foxes, dogs	direct or indirect contact with urine of infected animals
Orf	*Orf virus*	goats, sheep	close contact
Q fever	*Coxiella burnetii*	livestock and other domestic animals such as dogs and cats	inhalation of spores, contact with bodily fluid or faeces
Rabies	*Rabies virus*	commonly – dogs, bats,	through saliva by

		monkeys, raccoons, foxes, skunks, cattle, goats, sheep, wolves, coyotes, groundhogs, horses, opossums, mongooses and cats	biting, or through scratches from an infected animal
Rift Valley fever	*Phlebovirus*	livestock, buffaloes, camels	mosquito bite, contact with bodily fluids, blood, tissues, breathing around butchered animals and/or raw milk
Swine influenza	any strain of the influenza virus endemic in pigs (excludes H1N1 swine flu, which is a human virus)	Pigs	close contact
Toxocariasis	*Toxocara canis*, *Toxocara cati*	dogs, foxes, cats	ingestion of eggs in soil, fresh or unwashed vegetables and/or undercooked meat
Toxoplasmosis	*Toxoplasma gondii*	cats, livestock, poultry	exposure to cat feces, organ transplantation, blood transfusion, contaminated soil, water, grass, unwashed vegetables, unpasteurized dairy products and undercooked meat
Trichinosis	*Trichinella* spp.	rodents, pigs, horses, bears, walruses, dogs, foxes, crocodiles, birds	eating undercooked meat
Tuberculosis	*Mycobacterium bovis*	infected cattle, deer, llamas, pigs, domestic cats, wild carnivores (foxes, coyotes) and omnivores (possums, mustelids and rodents)	milk, exhaled air, sputum, urine, faeces and pus from infected animals

Self-Check -6	Written Test

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

1. _____are caused by a diverse group of pathogens that are transmissible from animals to humans.(**2points**)
   A. Zoonotic diseases
   B. Pathogens
   C. Diseases
   D. unconventional agents
2. Which one of the following is type of zoonotic disease caused by virus?(**2points**)
   A. Rabies
   B. Anthrax
   C. Ringworm
   D. Echinococcosis
3. What is the pathogen, animals involved and mode of transmission of Anthrax?(**6points**)

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

List of Reference Materials

1. http://vikaspedia.in/agriculture/livestock/general-management-practices-of-livestock/common-animal-diseases-and-their-prevention-and-treatments.
2. https://en.wikipedia.org/wiki/Infection. This page was last edited on 22 September 2019, at 16:38 (UTC).
3. Indiana State Poultry Association (2019): Module three: common poultry diseases and prevention methods. Indiana State Poultry Association, Purdue University Animal Sciences, 270 South Russell Street, West Lafayette, IN 47907-2041.
4. Romich, J.A. (2009): An Illustrated Guide to Veterinary Medical Terminology. Delmar, Cengage Learning, USA, 3rd edition.
5. Singh, S. R., Krishnamurthy, N.B. and Mathew, B.B. (2014): "A Review on Recent Diseases Caused by Microbes." Journal of Applied and Environmental Microbiology, vol. 2, no. 4.

ANIMAL HEALTH CARE SERVICE

NTQF Level -II

Learning Guide -2

Unit of Competence: - Assist General Animal Health care

Module Title: Assisting General Animal Health Care

LG Code: AGR AHC2 M14 LO2-LG-02

TTLM Code: AGR AHC2 M14 TTLM0919v1

LO 2: Recognize vital signs of animals

Instruction Sheet	Learning Guide # 2

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

- Tools and equipment used for measurement of vital signs
- Restraints methods to hold patients
- General conditions and health of animal
- Clinically important body structure of animals
- Record physiological parameters
- Report unusual condition of the animal

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

- Identify tools and equipment used for measurement and check-up of vital signs
- Use appropriate restraints to hold patients for examination in line with clinic procedures.
- Check and record the general condition and health of animal in accordance with organisational guidelines and procedures.
- Identify and compare different types of clinically important anatomy and physiology of animal body structure to determine physical appearance, observation and recording requirements.
- Record physiological parameters in line with clinical diagnosis procedure
- Report unusual condition or health of the animal promptly to supervisor.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4,Sheet 5” and Sheet 6.
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3, Self-check 4 ,Self-check 5and Self-check 6” **in page -38, 50, 54, 58, 65 and 68** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1 and Operation sheet 2” **in page -69 and 70 respectively.**
6. Do the “LAP test” **in page – 71** (if you are ready).

Information Sheet-1	Tools and equipment used for measurement of vital signs

1.1. Weight measurement tools and equipment

There are several types of scales habitually used in veterinary facilities –digital floor scales, portable baby scales, and smaller digital mail-type scales for smaller patients. Digital scales are calibrated to zero before the patient is placed on the platform to be weighed. Because there can be such a wide range of weights in veterinary patients (ranging from a pound or two to over 100 pounds), there are a variety of scales meant to assist in weighing a variety of patients. Make sure to become familiar with where the scales are located and which one is used for each weight range.

Kilograms to Pounds	Pounds to Kilograms
Lbs = kg x 2.2	Kg = lbs ÷ 2.2

Photo Courtesy of Animal Care Equipment and Services

1.2. Thermometer

Thermometer- its name comes from merging two Latin terms together: 'thermo', which means heat, and 'meter', which means a measuring device. A thermometer is a **device** that measures temperature or a temperature gradient. **Clinical thermometer** is used for measuring human or animal body temperature. The tip of the thermometer is inserted into the mouth under the tongue (oral or sub-lingual temperature), under the armpit (axillary temperature), into the rectum via the anus (rectal temperature), into the ear (tympanic temperature), or on the forehead (temporal temperature). A thermometer has **two** important elements:

1. **A temperature sensor** (e.g. the bulb of a mercury-in-glass thermometer or the pyrometric sensor in an infrared thermometer) in which some change occurs with a change in temperature; and
2. Some means of converting this change into a **numerical value** (e.g. the visible scale that is marked on a mercury-in-glass thermometer or the digital readout on an infrared model).

Thermometers are widely used in technology and industry to monitor processes, in meteorology, in medicine, and in scientific research.

Categories

There are different types of thermometers such as a medical or clinical thermometer, which is used to measure somebody's body temperature. There are many other classifications. There are **three** categories of thermometers which are given these:

A. Clinical thermometer

It is used to measure human or animal body temperature in the range of 35 °C to 42 °C.

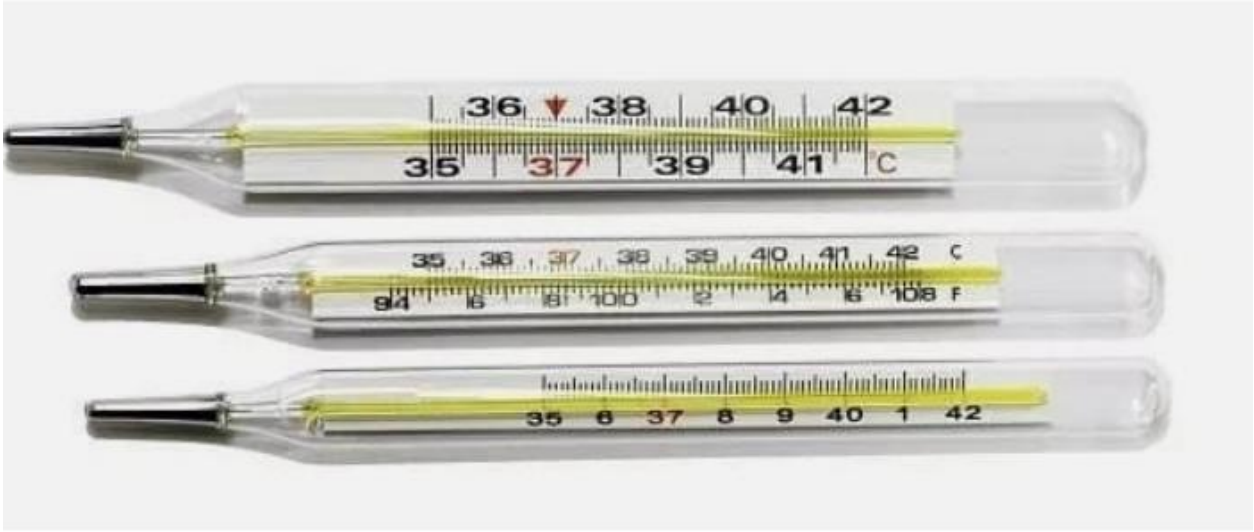


Figure 1: Clinical thermometer

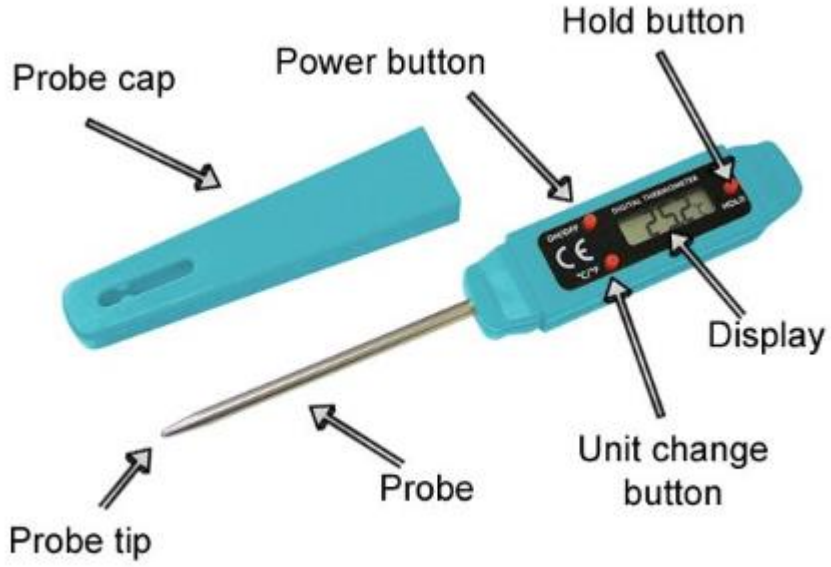
B. Lab thermometer

It is used to measure the room temperature of hot solids and liquids in experiments. It measures temperature in the range of 5 °C to 110 °C and on higher temperatures**.**

C. Digital thermometers:

These are advanced thermometers used to measure the temperature of a body of a high level of accuracy. Digital or electronic thermometers are one of the most recent developments in the thermometer field. Instead of using liquids or gases paired with a temperature scale, they have a digital screen, which can show you the readings in mere seconds. A digital thermometer has a **thermistor** that reacts to the change in temperature and projects the result on the thermometer screen.

Figure 2: - This picture is an example of a digital clinical thermometer that reads 36.8^{0}C 97.7^0 F.



Probe

The probe on a digital thermometer is generally long and thin, with a pointed tip so it can penetrate into the centre of some objects. As only the tip detects temperature it is left bare, although the rest of the probe may be plastic coated.

Probe cap

The cap protects the probe when the instrument is not in use. Not all digital thermometers are provided with one.

Display

The display is LCD (liquid crystal display) and will show the temperature, generally to one decimal place. A minus sign will appear for readings lower than zero.

Figure 3: parts of digital thermometer

Types of thermometer

There are six most common clinical thermometers used in hospitals and homes:

- **Mercury-filled thermometers**: - One of the oldest types, mercury-filled thermometers are slowly disappearing from most countries. In addition to not being the most accurate, they might be very dangerous if broken. The mercury inside is toxic to people and the environment.

Figure 4: - Mercury thermometer

- **Alcohol-filled thermometers**: - A safer alternative to the previous type, these thermometers use coloured alcohol that expands when exposed to increased temperature. However, both of these liquid-filled thermometers require some time to show the temperature. If you want more immediate results, consider one of the following options.

Figure 5: - Alcohol filed thermometer

- **Temperature strips: -** Although temperature strips are not thermometers per se, they are often used in hospitals as a way of quickly determining a patient's temperature. These strips contain liquid crystals that react to heat by changing colour. Each colour corresponds with a certain body temperature. This type is fast, but it is not the most reliable.
- **Infrared thermometers**: - This type is mostly used to determine the person's temperature through their ear. However, some infrared thermometers determine the temperature near a person's forehead. It works almost instantly; in a few seconds, you can get a precise temperature reading on a small screen.
- **Digital thermometers**: - Digital thermometers are quickly replacing all of the old liquid-in-glass versions. Instead of using liquids or gases paired with a temperature scale, they have a digital screen, which can show you the readings in mere seconds. A digital thermometer has a **thermistor** that reacts to the change in temperature and projects the result on the **thermometer screen**. They are fast, accurate and convenient. With the help of oral, rectal and armpit digital thermometers, you can get your results in mere moments.

Figure 6: - Digital electronic thermometers

- **Basal thermometers**: - Even though they are only a form of digital thermometer, they are still different. This type is meant for women that are trying to get pregnant. It allows women to track ovulation, as it is accurate to 1/100 fraction of a degree. Some of the versions also have a function that lets you see the previous readings, which makes it easier to take note of the changes.

1.3. Stethoscope

The **stethoscope** is an acoustic medical device for auscultation, or listening to the internal sounds of an animal or human body. It typically has a small disc-shaped **resonator** that is placed against the skin, and one or two **tubes** connected to two **earpieces**. A stethoscope can be used to listen to the sounds made by the heart, lungs or intestines, as well as blood flow in arteries and veins. Stethoscopes can also be used to check **scientific vacuum chambers** for leaks, and for various other small-scale acoustic monitoring tasks. A stethoscope that intensifies auscultatory sounds is called

phonendoscope.

1.3.1. Types of stethoscope

- **Acoustic: -** Acoustic stethoscopes are familiar to most people, and operate on the transmission of sound from the chest piece, via air-filled hollow tubes, to the listener's ears. The chestpiece usually consists of two sides that can be placed against the patient for sensing sound; a diaphragm (plastic disc) or bell (hollow cup).
- **Electronic:-** An electronic stethoscope overcomes the low sound levels by electronically amplifying body sounds**.**

Electronic Stethoscope

Figure 7: Part of Stethoscope.

Self-Check -1	Written Test

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

1. Define thermometer.(**1point**)
2. What are types of scales habitually used in veterinary facilities?(**3points**)
3. Write parts and use of the following vital sign measuring instruments.(**6points**)
   A. Stethoscope
   B. Thermometer

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-2	Restraints methods to hold patients

2.1. Concept of restraint

Restraint is the term used to imply control of an animal and may be necessary for medical reasons and nonmedical procedures. Animals are often resist to the clinical examination procedures. The animal must be restrained so that it can be examined carefully, safely and with confidence. Four basic factors should be considered when selecting a restraint technique:

(1) Will it be safe for the person who must handle the animal?

(2) Does it provide maximum safety for the animal?

(3) Will it be possible to accomplish the intended procedure by utilizing the suggested restraint method?

(4) Can constant observation and attention be given the animal following restraint until it has fully recovered from the physical or chemical effects? Once these four factors are evaluated, a suitable technique can be selected.

2.2. Methods of restraint

The methods of restraint should be done, in order to able to carry out the examination safely and without danger to the clinician and assistants. The methods available may be classified as the following:-

- Physical restraint.
- Chemical restraint
- Verbal/Moral restraining

2.2.1. Physical restraint

It is important to perform all the physical manipulations in a quiet and gentle manner in order to carry out the examination safely without causing danger to the clinician or his assistants and to avoid disturbing the patient. Restraining methods for equine, cattle, Pet animal, sheep and goats.

Restraints of the equine: Equipment used for restraint and handling should be effective without causing stress to the horse and should be designed for maximum safety of the handler and horse. A horse should be approached from the front and slightly to the left (near)

side because they are accustomed to being handled on that side. They become nervous when handled from the right side. A **halter** and **lead** rope is the most common form of restraint. When used by knowledgeable handlers, other acceptable forms of restraint include **hobbles, twitches, lead chains, stocks** and **chutes**. Permanent halters are constructed of leather or nylon webbing, or cotton and nylon rope. Temporary halters may be constructed of rope **Tethering** is a form of restraint that brings a high risk of injury to horses unless used correctly. Tethering means attaching a long rope or chain to the halter or leg hobble so the horse can graze.

Figure 8: Rope halter.

Restraint of the cattle: Restraint of cattle depends on breed, age, sex and knowledge of animal behaviour. For example, bulls are unpredictable and should be handled with care. Aggressive bulls for instance, will paw the ground with front feet, lower and shake the head. They may also make mowing sounds. Nervous cows will keep head and tail up and may have an anxious expression in their eyes. The followings are the methods for restraint of cattle:

- The nasal septum is gripped between the thumb and one finger or with „bull-holder
- Leg twitches are also employed
- One rope locking two horns on a post or tree
- One rope two-person cattle casting
- Two ropes three-person cattle casting

- Chest twitch: Chest twitch is used for exceptionally restless cattle.
- Restraint using a crush

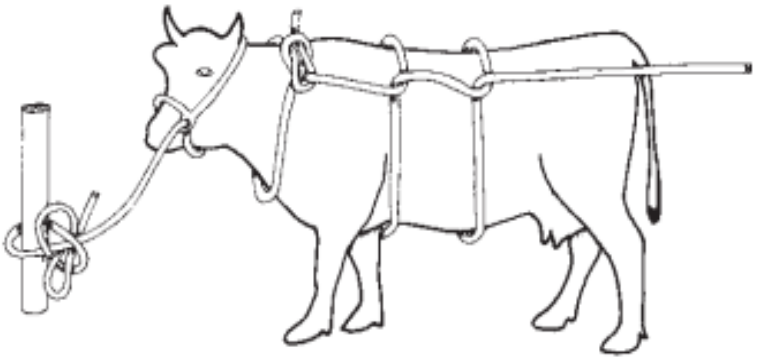


Figure 9: Diagram of the half-hitch method of cattle casting .

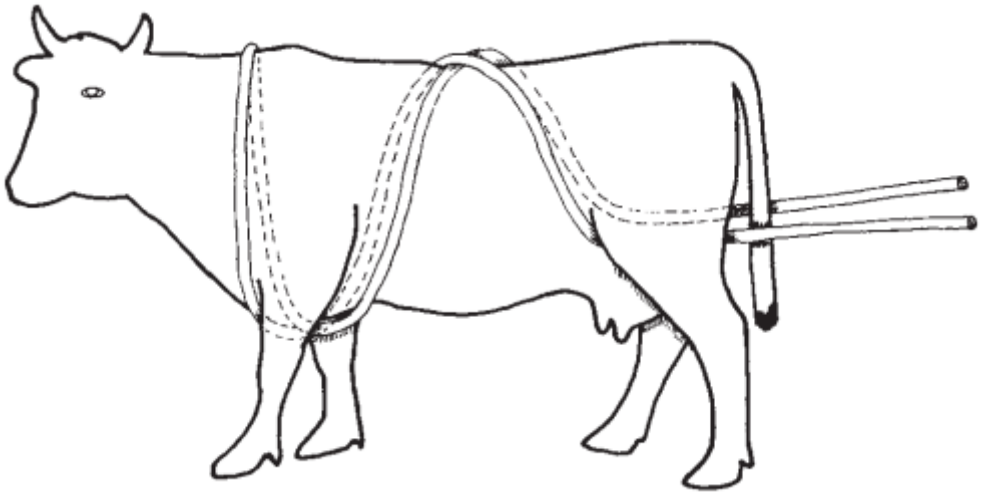


Figure 10: Diagram of crisscross method of cattle casting.

Restraint of sheep and goat: Sheep have an intense instinct to remain with the flock and as such, it is best to handle them as a flock initially before isolating the animal you want to perform certain procedures on. When disturbed, they will stamp their front feet and will use the head to attack. Hence, always work gently, calmly and with assurance around them. Sheep have very fragile bones that can easily be broken and heavily woolled sheep may become hyperthermined if chased around. The following are the methods how to restraint and holding sheep:

- Capturing a sheep: The sheep can be captured by driving the flock into a small pen or enclosure and then approach an individual animal slowly. Swing your arm around the neck and front quarters and quickly wrap your other hand around the hindquarters or grasp the tail if present.

- Shepherds crook: Hook a rear leg at the hock, quickly immobilizes sheep as above.
- Halters: Can be used but remember sheep have a short nose and should be careful not to block the nostrils.

Figure 11: Holding sheep

Restraint of goat: Goats do not tolerate rough treatment and will struggle violently if not properly handled. Therefore, restraint time should be as short as it is necessarily possibl.

- Walls and fences: Push the goat against the fence or wall with your legs and hip and leave your hands free for other procedures.
- Restraint on lateral recumbency: The goat is placed parallel to your legs; the jaws are grasped with one hand while the inside rear leg is grasped with the other hand. Bring the leg forwards. The goat will be thrown off balance and fall on the ground.
- Restraint of the Head: This is best when the goat is pushed in a corner and the body held against a wall. **Procedure**: Grasp the beard (if bearded) with one hand and encircle the neck with the other arm to stabilize the head.
- Use of horns: This should only be for a short time as goats react violently when horns are held. Moreover, horns should not be used in very old goats as they break easily.
- Cheek hold: Place one hand on either side of the cheeks and wrap fingers around the mandibles to hold firmly. You can examine the eyes or take blood from the jugular.
- Collars: Leather collar or neck chain can be used in dairy goats to lead or restrain them. They may be temporary or permanent (collars).

Figure 12: Holding the head for dehorning

Restraint of Pet animals: Cats have always relied on speed, agility, caution, needle sharp teeth and dagger-like claws for survival. Therefore, they should be approached in a feeble manner. Restraint techniques of cat are as following:

- Leg restraint: Always place an index finger or middle finger between two legs. This provides a better grip to prevent escape.
- Head – Mandible hold: The palm of the hand is placed under the cat"s chin and the fingers are used to grasp mandible.
- Scruff of the neck: Hold as much of the loose skin on the back of the cat"s neck as possible. This prevents the cat from turning its head to bite.
- Restraint with towel: Cover the head with a towel or cover the entire cat; then lift it up, isolate the needed part and uncover it. This is good for injection or examination.
- Restraint bag: Feline restraint bag (cat bag) is normally used to restrict the movement of the cat and also to protect the handler from scratches.
- Restraint with the adhesive tape: Apply adhesive tape around the legs starting with the hind legs then followed by the fore legs.
- Gauze muzzle: They can be commercially available (leather muzzles) or home made using gauze. **Procedure of gauze muzzle**: Make an over hand knot in the middle of the gauze to form a loop. Next, lower the loop over the cat"s muzzle and tighten it on both ends of the gauze. Bring the gauze under the

jaws, which are tied together under the mandible using an overhand knot with both ends brought behind the ears.

Figure 13: Wrapping cat in a towel: place cat in center of the towel. Left one cover the top of the cat, and then quickly roll the cat.

A dog's only weapons are its large canine teeth and to a lesser extent the toenails. Scratches from a dog are usually not serious, but a bite from a large Alsatian or St. Bernard can both disfigure and disable. Every precaution should be taken to prevent injury. Approach any strange dog with caution.

- Muzzles: Commercial muzzles are made of leather, wire or fabric. There are also gauze or nylon rope muzzles.
- Gauze or Rope Muzzles: For dogs with long noses, you do not need to pass the passive end between the eyes to secure the loop over the nose before tying the bow gauze after passing behind the ears. A muzzle can be constructed from a piece of 5-cm (2-in.) gauze bandage or a small cord. Form a loop large enough to drape over the mouth of the animal, keeping the hand some distance away. The leash prevents the dog from backing away when approached.
- The leash is an important device.
- Collars vary greatly in design.

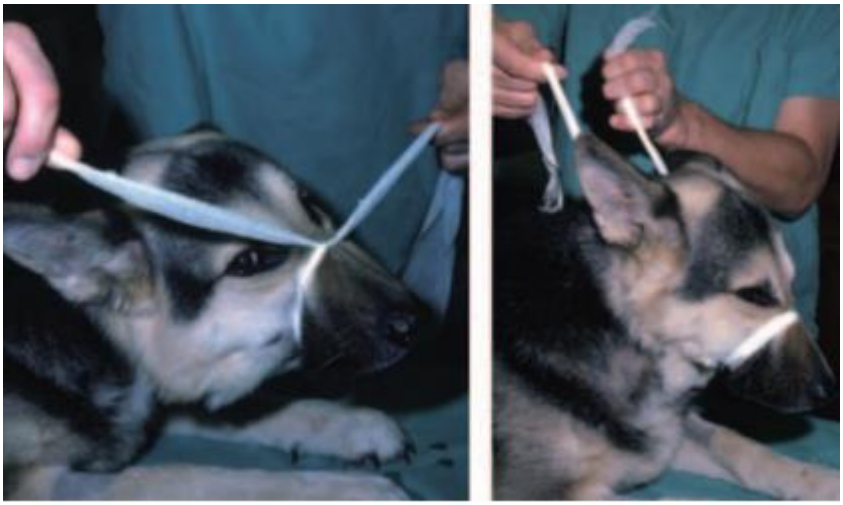


Figure 14: Muzzling a dog.

Restraint of poultry and birds: Free movement of the sternum is essential for respiration in birds. They possess no diaphragm and their lungs do not expand and contract. They breathe through expansion and contraction of their air sacs facilitated by their intercostal muscles. Thus, any undue pressure on their sternum would restrict breathing.

There are five basic means of holding a bird's head.

- Extend the head between the index and middle finger,
- Grasp the head with the thumb and index finger on either side of the head at the temporo-mandibular joint,
- Using three fingers, place the thumb and middle finger just below the eyes and the index finger over the head, called the 'helmet grip,'

- Crook the index finger behind the back of the head and gently place the thumb behind the lower mandible,
- Gently circling the neck with the thumb and index finger as a tubular restraint collar would.

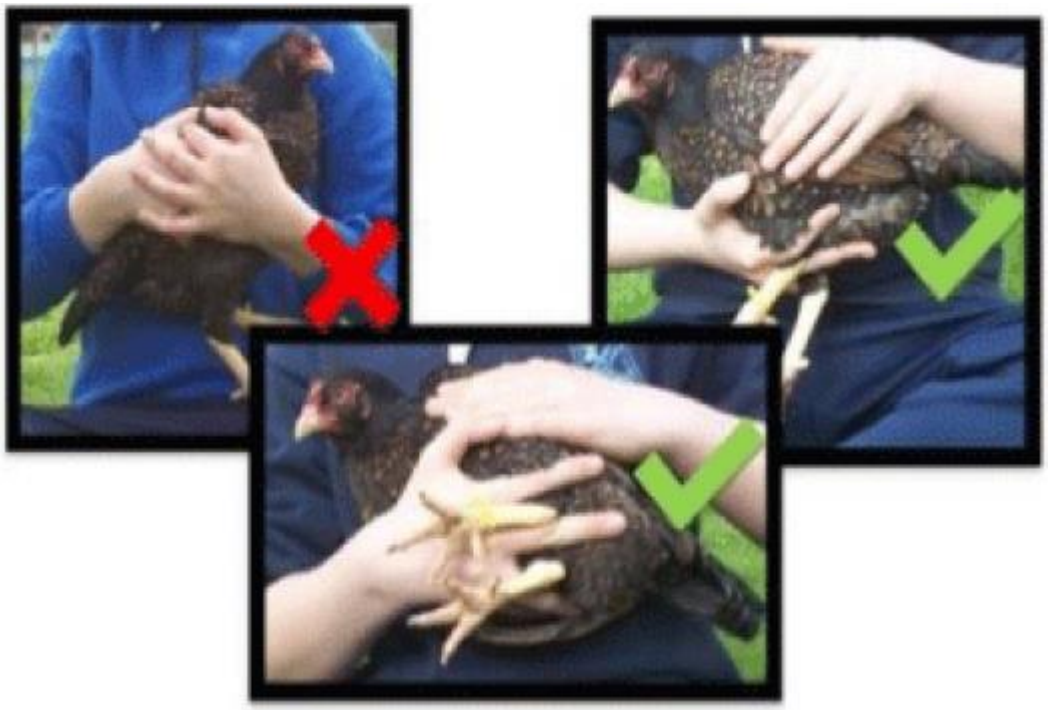


Figure 15: Restraint or holding methods for birds.

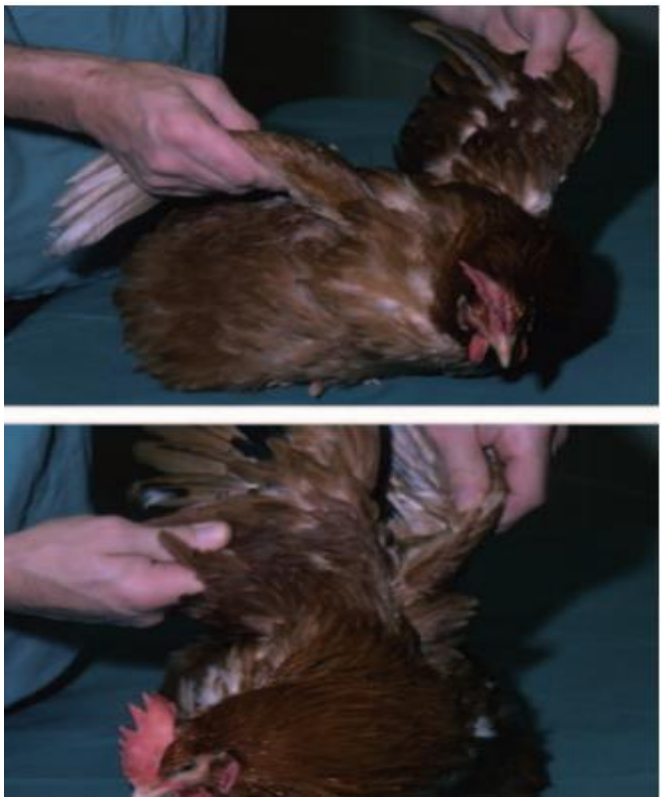


Figure 16: Interfolding wings of a chicken: Grasp wings, upper. Cross wings and wrap them around one another, lower

Restraint of Camels: Camels may be restricted by placing them in a chute.

Camels accustomed to being handled may be haltered and led into stocks used for horses .Keep in mind the potential sweep of the legs. Camels may be roped and snubbed to a tree or post or moved to a more contained area to be haltered. Camels have been physically restrained in the sternal recumbent position (kushed) for centuries in camel-using countries. Either a leather strap or rope is used to place a loop or figure 8 around the front limb when the leg is flexed at the carpus. Alternatively, both front limbs may be linked together by a rope or strap over the neck. The camel can only rise to its knees.

Figure 17: Home constructed camel chute.

Figure 18: Foreleg restraint to keep a camel in sternal recumbency (kushed).

Figure 19: Applying soft rope to assist a camel into sternal recumbency.

2.2.2. Chemical restraint

Chemical restraint may be defined as the use of drugs to bring about sedation or neurolepsis, neuroleptanalgesia, neuroleptanaesthesia or short duration general anaesthesia. This is a reversible process whose purpose is to produce convenient, safe, effective and inexpensive means of restraint so that clinical procedures may be carried out with minimum of stress, pain, discomfort, and toxic effects to the patient, the anaesthetist or the clinician. Drugs that is useful for this purpose includes: Acepromazine, Acetylpromazine, Chlorpromazine, Promazine and Trimeprazine; members of this group can be used in most species of animals, Butorphanol, hloral hydrat.

Table 1: Chemical restraint agents used for immobilization of horses, mules, donkeys

No.	Agent/combination	Intramuscular dose (mg/kg)	Intravenous dose (mg/kg)
1.	Xylazine/ketamine	1.1/2.2	1.1/2.2
2.	Detomidine/ketamine	No	0.2/2.2
3.	Medetomidine/ketamine	0.02–0.04/2.2	0.02–0.04/2.2
4.	Tiletamine/zolazepam	0.5–1.1	0.02–0.5

Table 2: Chemical restraint agents used for sedation and immobilization of cattle.

Drugs/combinations	Intramuscular(mg/kg) or as indicated	Intravenous (mg/kg)
Standing sedation		
Xylazine	0.015–0.025	0.015–0.025
Detomidine		0.0025–0.01
Immobilization		
Xylazine/ketamine	0.1–0.2	
Xylazine/telazol	0.1/4.0	0.05/1.0
Diazepam/ketamine		0.1/4.5
Tiletamine/zolazepam		4.0

2.2.3. Verbal/moral restraining

It is more practiced by owner e.g., feed provision, massaging, calling name of animal etc. When the horse is alert, the ears are flicked forwards and the horse is usually curious of one"s approach. A nervous horse will continuously flick the ears back and forth especially when there is activity behind it while an angry or fearful horse will pull its ears backwards. This should however not be confused with laid-back ears where a horse is concentrating on a difficult task such as calf roping or barrel racing. The tail always indicates the horse"s attitude.

Self-Check -2	Written Test

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

1. Please explain what does mean by restraint? (**2 points**)
2. What is the importance of restraint?(**1point**)
3. List out the methods of restraint and give two examples for each. (**6 points**)

Note: **Satisfactory rating – 9 points** **Unsatisfactory - below 9 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-3	General conditions and health of animal

3.1. Essential elements of good health

For optimum health and maximum productivity balanced feed, pure water and air are essential. However, other things are needed including good grazing and, in the case of animals kept under intensive conditions (e.g. intensive dairy production), supplementary feeding, suitable, well ventilated buildings, adequate exercise, periods out in the sunshine, good bedding (if kept inside), clean and hygienic surroundings and freedom from contact with disease. If kept under tropical conditions with high temperatures, high producing, exotic breeds of cattle of temperate country origin (such as Friesians) can be provided with fans and regularly put through shower sprays to keep them cool. Ensuring that the animal has these things, varying in accordance with the environmental conditions and the purpose for which it is kept, is what is meant by good livestock management and good animal husbandry.

3.2. Appearance of a healthy animal

In its general appearance the healthy animal is **alert**, **active**, and **well aware** of its surroundings and, when walking, walks easily and with regular steps. Its eyes are **bright**, **wide open** and with **no sign of discharge** at the corners. Its **ears** are **erect** (in most breeds), move quickly to counter flies and towards unusual sounds. Its tail is also in **continuous movement** against flies.

Movement (gait):- The healthy animal will walk easily and steadily with all of its feet taking its weight. Steps should be regular. Irregular movement results from pain in the feet or limbs. Horses normally stand during the day. If you go near an animal that is lying down it should stand up quickly otherwise it has health problems.

Eyes:-The eyes should be bright and alert with no discharge at the corners.

Ears: - Most animals have erect ears which move in the direction of any sound. Ear movements will also be quick to get rid of flies, he body temperature of the pig can be checked by touching the ear when an unusually high temperature will be noticed.

Nose and Muzzle:- The nose should be clean with no discharge. In cattle and buffalo the muzzle should be moist not dry. In sheep and goats the nose should be cool and dry. Healthy animals frequently lick their noses with their tongues

Mouth: - There should be no saliva dripping from the mouth. If chewing is slow or incomplete there must be a problem with the teeth.

The coat: - In short-haired animals, e.g. goat and cattle, the hair or coat of the healthy animal will be smooth and shiny. Healthy cattle, buffalo and their calves lick their coat and the lick marks will show. Horses should not sweat when resting. In poultry the feathers should be smooth and glossy and not ruffled. In pigs a curly tail is a sign of good health while a scaly skin points to health problems.

Droppings or dung:- The droppings of the healthy animal will be firm. Very soft droppings (diarrhoea) are a sign of ill health. If the animal has difficulty in defecating (constipation) this is also a bad health sign.

Urine: - The urine should be clear and the animal shows no signs of pain or difficulty in urinating. Horses, mules and donkeys can have thick yellow urine which is normal.

Appetite and rumination: - The animal should eat and drink normally. Failure to eat is an obvious sign of ill health. If feed is available the healthy animal will have a full belly. Pigs will naturally rush at their feed, if they do not something is wrong. Sheep, goats, cattle, buffalo and camels chew the cud (ruminate) for 6 to 8 hours each day. It is a sign of ill health when these animals stop ruminating.

Milk: - In the milking animal a sudden change in the amount of milk produced can mean a health problem. Any sign of blood or other matter in the milk points to infection in the udder. There should be no swelling of the udder and no sign of pain when it is touched. There should be no injury to the teat.

3.3. Physical body condition

Body condition scoring is an important management practice used by producers as a tool to help optimize production, evaluate health, and assess nutritional status. Different scores can be given for individual animal and can further classified as normal, fatty, lean/thin, emaciation.

Condition Score 1: Very thin: This animal's skeletal structure is very **prominent**. Notice the deep depressions next to the spine, between the pelvis and rib cage, between the hooks and pins, and around the tail head.

Condition Score 2: **Thin**: The animal's skeleton is still very **apparent**. The individual spinous processes are clearly visible, but there is a small amount of fat tissue over the spine, hooks, and pins.

Condition Score 3: Medium (Normal body condition): The animal appears smooth over the spine, ribs, and pelvis and the skeletal structure can be easily palpated. The hooks and pins are still discernible, with a moderate, rather deep depression between the pelvis and rib cage, hooks and pins, and around the tail-head.

Condition Score 4: **Fat**: There are no spinous processes detectable, and no depression in the loin area, which gives the top-line of the animal a flat, tabletop appearance. The ribs can no longer be felt, and the pelvis can only be felt with firm pressure. The hooks and pins have a rounded appearance due to areas of fat covering.

Condition Score 5: Very Fat: The animal appears rounded and smooth with a square-shaped appearance, because of the amount of fat filling in the loin. The skeletal structure is no longer visible, and can only be palpated with excessive pressure

Self-Check -3	Written Test

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

1. What are essential elements of good health in animals? (**2 points**)
2. Write general appearance healthy animal. **(5 points)**
3. Describe classification of body condition scoring. (**5 points**)

Note: **Satisfactory rating – 12 points** **Unsatisfactory - below 12 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-4	Clinically important body structure of animals

4.1. Head and neck

- Check symmetry of the head
- Carriage of head – normal or tilted
- Movements of head and neck – normal or abnormal
- Mobility of the neck.
- Check the eyes, ears, muzzle and nostrils, Can the animal see? ,Can the animal hear
- Ocular or nasal discharge
- Examine the mouth, palpate the tongue and lymph nodes of the head
- Ability to prehend, masticate and swallow food *
- Salivation – normal or excessive,
- Check the jugular vein, brisket and prescapular lymph nodes

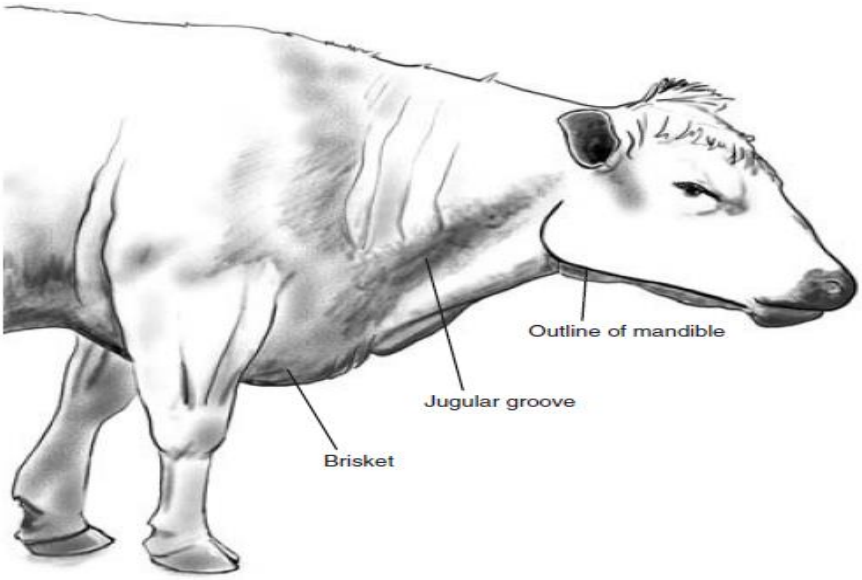


Figure 20: Lateral (side) view of the outline of the bovine head and neck.

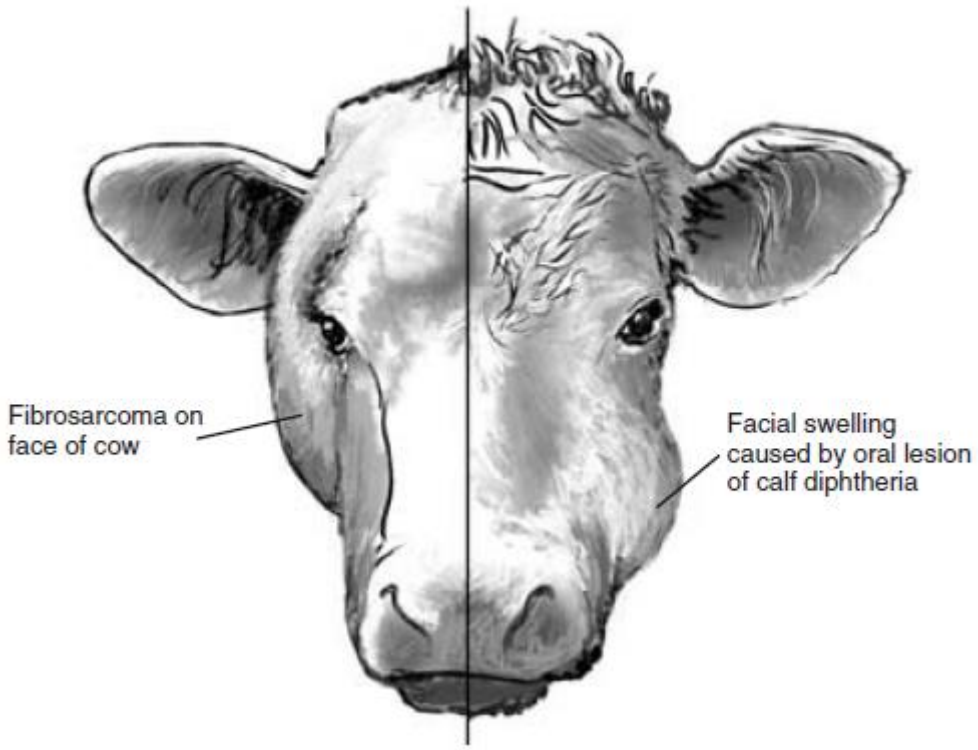


Figure 21: Abnormal facial swellings on cow and calf.

4.2. Left thorax and abdomen

- Palpate and auscultate the heart – check for abnormalities
- Auscultate and percuss the lung field – check for abnormalities
- Check the abdominal shape and contour
- Palpate and auscultate the rumen
- Percuss and auscultate the body wall
- Ballott the lower flank

4.3. Right thorax and abdomen

- Palpate and auscultate the heart – check for abnormalities
- Auscultate and percuss the lung field – check for abnormalities
- Check the abdominal shape and contour
- Check the position and size of the liver
- Percuss and auscultate the body wall
- Palpate and auscultate the sublumbar fossa
- Ballott the lower flank

4.4. Limbs

- Observe for signs of lameness
- Palpate the limbs
- Raise and examine the feet

An organ is a complex structure with a special job or a number of jobs to do. For example:

- The eye is the organ of sight.
- The kidneys are organs which get rid of water and poisonous materials from the body as urine.
- The liver has many jobs and is involved in more than one system.

Self-Check -4	Written Test

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

1. All of the following are clinically important body structure of animals found on left thorax and abdomen, **except**.(**2 points**)
   A. Heart
   B. Rumen
   C. Limbs
   D. All
2. What are clinically important body structure of animals which found on head and neck region? (**3 points**)

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-5	Record physiological parameters

5.1. Introduction

The accurate measurement and monitoring of physiological parameters, including **temperature**, **heart rate (HR)** and **respiration rate (RR),** plays an important role in a wide variety of applications in healthcare. Dynamic changes in physiological parameters can reveal **changes** in the physiological status and function of a patient or laboratory animals. For example if there is abnormal increment in body temperature or respiratory rate it shows abnormal condition of the animal. Most of the times the vital clinical parameters used for diagnosis of disease are: heartbeat, respiratory rate, body temperature, rumen motility rate and skin persistence rate.

5.2. Respiratory rate

Respiration (breathing) consists of inspiration (breathing in) and expiration (breathing out). Respiratory rate refers to the number of **breathes** per **minute**. This should be counted over a period of 1 minute before the animal is caught or restrained for examination. Respiratory movements can be observed at the right flank. Any change in the rate indicates respiratory involvement. Thoracic respiration is seen in animals suffering from acute peritonitis and abdominal respiration in pleurisy. Double expiratory movements are seen in emphysema in horses. Inspiratory or expiratory movements of the chest wall or flank can be counted. In cold weather exhaled breaths can be counted. If the animal is restless the clinician should count the rate of breathing for a shorter period and use simple multiplication to calculate the respiratory rate in breaths/minute. Mouth breathing is abnormal in cattle and is usually an indication of very poor lung function or a failingcirculation.

A method for respiration rate taking includes:-

- Inspection: Stand behind and to one side of the animal, and observe the movement of the thoracic and abdominal areas of the body.
- Palpation: Put one hand in front of the nostril, feel the exchange of the gas; or put one hand on the lung area or the thorax and feel the respiratory movements.
- Auscultation: Use stethoscope, listen to the respiration sound in the trachea or lung area.

5.3. Body temperature

Internal temperature which can be measured by clinical thermometer reflects the balance between heat production and heat loss from the body. Body surface temperature is always less than that of deep body or internal temperature. In animals, rectal temperature is the convenient site to take body temperature and sometimes vaginal temperature can be taken in female animals but it is 0.5^0c higher than rectal temperature.

Temperature is the measure of how hot or cold the animal body is. On the basis of the ability to regulate body temperature animals are divided into two groups via homeotherms and poikilotherms. Homeotherms are those animals including man that can regulate their temperature in relation to the environmental temperature. Poikilotherms are those animals that are unable to regulate their body temperature in relation to the environmental temperature (eg. Amphibians, Reptiles and fishes). Heat is generated in the body via the intracellular oxidation of food and the muscular activities. It is lost via the physical process of conduction, convection, and radiation and through the evaporation, respiration and excretion.

The body temperature is taken using a **mercury** or **digital** electronic thermometer placed carefully into the rectum.

Procedure: - how to take temperature and how to recording temperature

- The places, which can be used to take temperature, are rectum or vagina (approximately 0.5 degree centigrade higher in vagina).
- The thermometer should be sterilized by disinfectant (antiseptics) before use. Wet the thermometer with cold water or put some petroleum jelly (Vaseline) on the end to make it more slippery.
- It should be well shaken before recording of temperature to bring the mercury column below the lowest point likely to be observed in different species of animals. If the reading is not below 36°C, shake the mercury down to the bulb. Use flicking motions, taking care not to hit the thermometer on anything.
- The bulb end of the thermometer should be lubricated with liquid paraffin or glycerin or soap especially in case of small pup and kitten.

- Insert the thermometer in a rotational way and gentle manner. Care should be taken so that the bulb of the thermometer remains in contact with the rectal mucous membrane.
- The thermometer should be kept in site for at least 3-5 minutes.
- Pull out the thermometer, clean it and read the number.
- Read the value to define and explain a state of fever, hypothermia, and febrile or non-febrile animals.

Camel

Camels are homothermic animals. However, over a wide range of environmental conditions, body temperature of camels was found to fluctuate by a magnitude of 6°C. They reported that the rectal temperature of healthy camels at rest can vary from 34 to more than 40°C during the summer, while diurnal changes in the winter are in the order of 2°C. Diurnal variation in rectal temperature of camel deprived of drinking water may exceed 6°C during the summer. On the other hand, the variations in rectal temperature of camels that have free access to water are around 2°C.

5.4. Heart beat/Pulse

Pulse taking: Pulse is defined as the regular expansion and contraction of the arterial wall caused by the flow of blood through it at every heartbeat. Pulse gives information with regard to the cardio-vascular abnormalities.

It is influenced by exercise, excitement, annoyance, relative humidity, environmental temperature. Pulse can be adapted from the number of heart beats per minute by using stethoscope in less manageable animals. The rhythm of pulse should also be noticed while taking pulse. The pulse rate can rise rapidly in nervous animals or those which have undergone strenuous exercise. In such cases the pulse should be checked again after a period of rest lasting 5 to 10 minutes.

- In sheep and goats you can feel the pulse on the inside of the top of the back leg.
- The pulse of cattle is taken at a point on the underside of the base of the tail.
- In buffalo the pulse rate is 40 - 60 per minute.
- The pulse of the horse is taken on the inside of the cheek.
- The pulse of the camel is taken at a point on the underside of the root of the tail.

Note: - the pressure or pulsation of the arteries felt on the finger digits. It is useful to be able to find out how fast the heart is beating. There are several places where it can be felt. Using a watch with a second hand, count how many beats can be felt in a minute.

Count the number of beats per minute (counting should be done at least for 30 seconds and multiplied by 2); notice the quality and rhythm of pulse.

Table 3: **Site of pulse taking in domestic animals.**		
No	**Animals**	**Site of pulse taking**
1.	Equine	**External maxillary artery** Transverse facial artery Median artery Great metatarsal artery
2.	Cattle and pig	**Middle coccygeal artery** Facial artery Median artery
3.	Sheep, Goat, Calf.	Femoral artery.
4.	Piglet, Dog and Cat.	Femoral artery.

Factors influencing pulse

1. Species: different species of animal have different pulse rate, which is number of rise and fall of arterial wall per minute.
2. Size: higher in small than in large animals.
3. Age: higher in young than adult animals.
4. Sex: male slightly lower than female animal.
5. Parturition &Late stage of pregnancy: relatively more pulse rate
6. Exercise: increase pulse rate.
7. Ingestion of food: cause momentary increase in frequency of pulse.
8. Posture: pulse rate reduced about 10% when animal is recumbent than when standing

Procedure how to examine and take pulse

- Place the digits on the artery to be examined
- Applying gentle pressure until the pulse wave can be detected

Table 4: Range of the three normal vital parameters in various species of animals.

No.	**Animal species**	**Temperature in °C**	**Pulse rate per minute**	**Respiratory rate per minute**
1.	Cattle/ adult	37.8 –39.2	60– 90	25- 30
2.	Calve	38.5 –39.8	100-120	37-56
3.	Horse/adult	37.2 – 38	28– 42	8– 16
4.	Foal	37.5 -38.5	70-80	14-15
5.	Sheep	38.9 – 40	68- 90	10– 20
6.	Goat	38.6 –40.2	68- 90	10– 20
7.	Pig/adult	37.8- 38.9	60- 90	10– 20

8.	Piglet	38.9 – 40	110-140	
9.	Small dog	38.6 -39.2		
10.	Large dog	37.5 –38.6	90- 130	16– 30
11.	Cat	37.8 –39.2	110- 130	20– 30
12.	Chicken	41.7	200- 400	15– 30

5.5. Visible mucous membrane

The mucous membrane in the eyes, mouth and vagina in the case of females can be examined to determine the health status of an animal. Examination of the mucous membrane should be done in natural light (sunlight) not in the lamplight. The abnormalities of color of mucous membrane are cause by different factor like Pallor of the mucous membranes may indicate anaemia caused by direct blood loss or by haemolysis, A blue tinge may indicate cyanosis caused by insufficient oxygen in the blood, A yellow colour is a sign of jaundice, the mucosae may be bright red (sometimes described as being „injected mucous membranes") in febrile animals with septicaemia or viraemia, Bright red colouration of the conjunctiva is often seen, for example, in cases of bovine respiratory syncitial virus infection. A cherry-red colouration may be a feature of carbon monoxide poisoning. A greyish tinge in the mucosae may be seen in some cases of toxaemia – such membranes are sometimes said to be „dirty". High levels of methaemoglobin, seen in cases of nitrate and/or nitrite poisoning, may cause the mucosae to be brown coloured.

Table 5: **The normal colour of mucous membrane of different animals.**

Animal	**Colour of mucous membrane**
Cattle, sheet and goat	Pale pink
Horse	Pale roseate
Pig	Reddish
Dog	Pale roseate
Cat	Pale pink

5.6. Rumen motility rate

Rumen movements can be detected and measured by **observation** of the **sublumbar fossa**, **palpation** of the rumen and **auscultation** of the rumen. Observation of rumen movement at the left sublumbar fossa is only possible in good light and in animals that have a short coat. The moving rumen can be detected indirectly by observing the lateral displacement of the body wall. Palpation of the rumen is achieved by exerting

pressure on the rumenal wall via the left sublumbar fossa using a clenched fist. As the wave of movement passes beneath the hand the hand can be felt to be pushed gently outwards. Auscultation of the rumen movements by stethoscope is the most sensitive of the three methods. The phonendoscope diaphragm is placed in the sublumbar fossa and directed downwards towards the rumen. The loudness, character and duration of sounds can vary. It is not a discrete single sound. The sound has been described as a rasping or crushing sound or as crackling crescendo–decrescendo rolling thunder. The noise may persist for 5 to 8 seconds. Using this method, weak contractions can be detected that may be missed by the other techniques. Percussion of the left abdominal wall will produce resonance over the gas in the dorsal sac of the rumen. As the percussion proceeds ventrally the resonance declines over the fibre and fluid sectors of the rumen. Changes in rumen motility are indicators of disease.

Hypomotility (less than one movement every 2 minutes) or rumenostasis may cause a free gas bloat and is associated with a number of conditions including milk fever, carbohydrate engorgement (ruminal acidosis) and painful conditions of the abdomen. Hypermotility (more than five movements every 2 minutes) is less common and conditions include the development of frothy bloat, vagal indigestion and Johne's disease.

Self-Check -5	Written Test

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

1. _____is the convenient site to take body temperature.(**1 point**)
2. Examination of the mucous membrane should be done in natural light (sunlight) not in the lamplight. (**1 point**) **A. True B. False**
3. How do you detect and measure movements of the rumen? (**3 points**)
4. What are physiological parameters?(**4 points**)
5. List out a method for respiration rate taking. (**3 points**)

Note: **Satisfactory rating – 12 points** **Unsatisfactory - below 12 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-6	Report unusual condition of the animal

6.1. Symptoms that could be notifiable, serious, or unusual disease

Report any of the following symptoms in livestock or birds:

- a large number of sick or dead animals
- fast spread of disease through a herd or flock
- animals that are lame, drooling, or salivating excessively
- ulcers, erosions, or blisters around the feet, muzzle, udder, and the mouth
- unusual nervous behavior
- discharge, including:
  - diarrhoea, especially if there is blood in it
  - excessive nasal discharge
- birds with dullness, swollen heads, or respiratory distress
- production drop in
  - milk yield for livestock
  - egg production in birds
- an increase in thin-shelled eggs in birds
- sudden illness with rapid deterioration or death in horses
- any unusual or unfamiliar disease symptoms in animals or birds.
- Watch for less serious symptoms too. Animals not eating properly or depressed behaviour may be a sign of disease.

6.2. How to report suspected illness or disease

Give the following information when notifying your vet or animal health adviser:

- what pest or disease is suspected
- the name of the owner or farm manager
- property details including:
  - street address
  - telephone number
  - Property Identification Code
  - the livestock species
- the type of animals being affected

- a description of clinical signs of the illness
- the date symptoms were first noticed
- approximate number of sick or dead animals
- if any animals that could carry disease or illness were brought to the property or left it
- any overseas travel by people on the property.

Self-Check -6	Written Test

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

1. What are symptoms that could be notifiable, serious, or unusual disease in livestock?(**5 points**)
2. Write three information to report suspected illness or disease when notifying your vet or animal health adviser.(**3 points**)

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Operation Sheet 1	Restraints methods to hold patients -

1.1. Crisscross method of cattle casting

Step 1- Prepare materials (rope approximately 12meters long).

Step 2- Divide rope in half with each half coil to the center**.**

Step 3- Place the center of the rope over the neck and pass each coil between the front legs and across to the opposite side**.**

Step 4- A person must stand on each side to manipulate the ropes.

.**Step 5-** The ropes are then crossed over the top of the thorax to the side.

Step 6- The two persons then exchange ropes and pass them between the hind legs.

Step 7- All slack is removed from the ropes and pressure applied by pulling the ropes from the rear.

Step 8- Either one or both persons can exert the pressure necessary to pull the animal down.

1.2. Rear limb restraint: Applying soft rope to assist a camel into sternal recumbency

Step 1 - A soft cotton rope is brought up behind the hind limbs as the camel is being directed to kush (lie down)

Step 2 – Put the rope should be below the fetlock.

Step 3 - Once recumbent, the rope is placed medial to the stifles and tied tightly over the back behind the hump.

Operation Sheet 2	Record physiological parameters

Techniques for taking and recording temperature

Step 1- Keep the bulb of the thermometer immersed in the antiseptic solution for sterilization.

Step 2-. Bring down the column of the mercury before recording the temperature by shaking.

Step 3- Lubricate the bulb with liquid paraffin or Glycerine or soap and water, when the thermometer is to be used in pup or kitten.

Step 4- Insert the bulb of the thermometer into the rectum and tilt to one side so that the bulb of the thermometer touches the mucous membrane of the rectum**.**

Step 5- Keep the thermometer in site for at least 3-5 minutes.

Step 6- Pull out the thermometer, wipe the faeces with cotton, read the number and record the temperature.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1:30 hour.

Task 1. Performing restraints methods to hold patients

Task 2. Recording physiological parameters

List of Reference Materials

1. Abdisa T. (2017): Review on Practical Guidance of Veterinary Clinical Diagnostic Approach. Int. J. Vet. Sci. Res., ISSN: 2640-7604.
2. -Drug Administration and Control Authority of Ethiopia (2006): Standard Veterinary Treatment Guidelines for Veterinary Clinics. 1st edition.
3. Faraj, A.A. and Haidary, A. A. (2006): Measurement and Simulation of Camel Core Body Temperature Response to Ambient Temperature. Int. J. Agri. Biol., Vol. 8, No. 4.
4. Fowler, M.E. (2008): Restraint and Handling of Wild and Domestic Animals. Blackwell, State Avenue, Ames, USA. 1st edition.
5. https://www.edgefx.in/working-principle-electronic-stethoscope-circuit-diagram/
6. https://www.legit.ng/1120090-types-thermometer-uses.html
7. https://www.physiology.org › doi › abs › ajplegacy.1956.188.1.103
8. Jackson, P.G.G. and Cockcroft, P. D. (2002): Clinical Examination of Farm Animals. Blackwell Science, USA, 1st edition.

ANIMAL HEALTH CARE SERVICE

NTQF Level -II

Learning Guide -3

Unit of Competence: - Assist General Animal Health care

Module Title: Assisting General Animal Health Care

LG Code: AGR AHC2 M14 LO3-LG-03

TTLM Code: AGR AHC2 M14 TTLM0919v1

LO 3: Identify and report signs of ill health or injury in animals

Instruction Sheet	Learning Guide # 3

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

- Signs of illness and injury
- Abnormal animal behavior and conditions
- Separate sick and injured animals
- Symptoms of poisoning, toxicities and deficiencies
- Handle ill and injured animals

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

- Recognize and report signs of illness or injury to supervisor.
- Recognize and report abnormal animal behavior and conditions to supervisor.
- Separate sick or injured animals from other animals
- Identified symptoms of common poisoning/toxicities, deficiencies and clinical diseases
- Handled ill or injured animals in accordance with OHS and legislative requirements

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4 and Sheet 5”
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3, Self-check 4 and Self-check 5” **in page -78, 79, 82, 86 and 90** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1 and Operation Sheet 2” **in page -91.**
6. Do the “LAP test” **in page – 92** (if you are ready).

Information Sheet-1	Signs of illness and injury

1.1. Recognising animal illness

Animal care personnel must be trained to recognize signs of illness and injury. In general, sick and injured animals should be segregated from the main group to protect them and the other animals, observed at least once daily, and provided with veterinary care as appropriate.

The first step in disease recognition and control is being able to recognise when an animal or group of animals is unwell. By compiling information from the **history** of an animal or group of animals, conducting a **physical examination**, and undertaking **special testing** (if necessary) the veterinarian or government inspector is generally able to determine the cause of a condition or disease.

The following list outlines some of the more common signs that can be looked out for in an ill animal:

Common signs of an ill or injured animal

- The animal **not eating** as much as usual – this is usually the first sign you will notice. It may also drink more or less water than normal, depending on the illness.
- An animal **standing** by itself **away from the herd**
- The animal **not getting up and walking** to the **feed bunk** - A very sick animal will lie down for long periods and will not get up when approached.
- Animal limping or **dragging a leg**
- **Discharge** from eyes, nose, or vaginal area
- There may be abnormal **lumps**
- The eyes may be dull and the mucous membranes may have **changed colour**.
    - Deep red membranes indicate **fever**
    - Pale membranes show **anaemia**
    - Yellow membranes indicate a **liver disorder**
    - Blue-red membranes show **heart** and **circulatory** problems, or pneumonia.
- Animal making **unusual noise** (bellowing, grunting)
- Animal acting **uncomfortable**, getting up and down
- The animal might be **sweating**. A cold sweat indicates pain while a hot sweat indicates fever. If the animal is in pain it will probably be restless (getting up and down and pacing about), and it may even be groaning

- **Diarrhoea** or straining to defecate
- Animal **not defecating** or with very little stool
- Animal **urinating** a lot, or not as much as usual
- Marked weight loss or gain
- The **coat** will look **dull** and **dry**, and the **hairs** may **stand up**.
- There may the presence of **open sores, dandruff,** or the **loss of hair** or **fur** from the body

Self-Check -1	Written Test

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

1. How do you determine the cause of a condition or disease?(**2 points**)
2. List out at least ten common signs of an ill or injured animal. (**5 points**)

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-2	Abnormal animal behavior and conditions

2.1. Abnormal demeanor /Behavioral change

Recognise any significant differences in the behaviour of an animal such as increases in **viciousness**, **lethargy** or any other abnormal signs such as **excessive head shaking, scratching, licking** or **biting** of certain parts of the body.

The general behavior of the animal should be considered by giving due attention to temperament and related circumstances such as showing **movement** and **sound** making, **erecting** ears and **holding up** of head, directing toward the external stimuli, running away or attacking and even fight. The reaction to external stimuli can be decreased reaction including; dullness/apathy, dummy, coma or increased reaction including; mild anxiety, restlessness, mania and frenzy.

The Abnormal demeanors in domestic animals are as follow:

- **Decreased** response (depression): dull (apathetic); dummy state; comma.
- **Excitation** or increased response: apprehension (mildly anxious); restlessness; mania; frenzy.
- **Posture**: It denotes the anatomical configuration when they remain in stationary situation. How does it stand? How does it sit? How does it lie?
- **Gait**: It indicates about the locomotory process of an animal.
- **Body** conformation: shape and size of the different body regions relative to other regions.

2.2. Body conformation/physical condition

It is the assessment of body condition by simple visual inspection and palpation of certain body parts such as ribs, spine, shoulder, and pelvis etc. accordingly;

Normal body condition- the animal is well conditioned, proper flesh cover over all parts of the skeleton, giving the animal round appearance.

Thin/poor - parts of the skeleton such as ribs and pelvis are easily observable from distance.

Emaciation/cachexia- very high degree of thinness and the skeleton is very prominent, the coat is lusterless, staring, dry skin with reduced elasticity.

Obesity- it is excessive deposition of fat in the body which is sufficient enough to cause systemic disturbance such as problem of breathing/dyspnea.

Self-Check -2	Written Test

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

1. All of the following are abnormal demeanors in domestic animals, **except**.(**2 points**)
   A. Comma
   B. Restlessness
   C. Dull
   D. None
2. Write body parts used to assess body condition by simple visual inspection and palpation. (**4 points**)

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-3	Separate sick and injured animals

3.1. Separate sick and injured animals

Disease may also develop within stock at any time, so look to separate sick animals to protect healthy animals. This is referred to as isolation and it allows sick animals to rest and recover and prevents disease spreading around the pen, group or wider farm. Sick animals should be isolated, placed in clean, well bedded areas with individual food and water supplied. They should be observed frequently. Pain reduces animal performance, whether milk yield or growth rate, and thereby reduces farm income. Diseases and injuries causing pain must be prevented wherever possible and is the goal of all farmers and their veterinary surgeons. Every veterinary clinic should have an isolation area for caring for and housing animals with potentially contagious infectious diseases.

3.2. Isolation facilities

The size and structure of the isolation facility varies with aspects such as clinic size, types of animal species treated and diseases that are endemic to the area. A proper isolation area should allow for complete physical separation of potentially infectious cases, and have areas for performing routine procedures such as bandage changes, thereby reducing the risk of direct or indirect infection of other hospitalized animals or clinic personnel. Ideally, isolation facilities should be in a low traffic location within the clinic. If an isolation area was not included in the original physical design of the clinic, a potential alternative in some cases may be to convert an examination room into a dedicated isolation room. The room selected should be in the area of the lowest human and animal traffic possible. The room should be easy to clean and disinfect and emptied of all non-essential equipment. This type of room conversion can be difficult to do effectively depending on the design and layout of the clinic and the room itself. The feasibility of using such a room for isolation of infectious animals must be assessed on a facility-by-facility basis.

Ventilation should be designed such that movement of air from the isolation room to other areas of the clinic is prevented (i.e. the room should be vented to the outdoors).

If this is not readily possible, a HEPA air filtration system should be used for the air leaving the isolation room.

Only the equipment and materials needed for the care and treatment of the individual animal should be kept in the isolation room. This may include items such as a designated stethoscope, thermometer, grooming supplies, leash, and muzzle. Supplies of items that will be used on subsequent isolation patients (e.g. packages of bandage material, boxes of needles and syringes) should not be kept in the isolation area. All items entering an occupied isolation area should be considered infectious and disposed of or disinfected after discharge of the patient. Items should not be removed from the room except for disposal. Use of disposable articles can minimize the need to take soiled items out of the isolation room.

When the isolation room is in use by an animal with a potentially contagious infectious disease:

- Prominent signage should indicate that the animal may be infectious and should outline any additional precautions that need to be taken in addition to routine isolation protocols.
- Access to the isolation room should be limited to the minimum number of essential personnel necessary to provide appropriate patient care.

Self-Check -3	Written Test

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

1. What is the importance of separate sick and injured animals.(**2 points**)
2. Write various aspects of size and structure of the isolation facility. (**3points**).

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-4	Symptoms of poisoning, toxicities and deficiencies

4.1. Symptoms of poisoning in animals

A poisoned animal may die suddenly or will show the following signs:

- Excessive salivation.
- The mouth is open and the tongue hangs out.
- Diarrhoea and vomiting.
- Difficulty in breathing.
- Causes of poisoning in animals

There are many causes of poisoning in animals:

There are very many poisonous plants. Seeds for planting may have been treated with chemicals. If animals or humans eat these they can die.

- **Strychnine** is a poison which can be used to kill wild dogs and wolves. It will also poison other animals
- **Weed killers** used in agriculture may be poisonous.
- **Chemicals** used to kill insects on plants or used for dipping against external parasites.
- **Old paints**, kerosene, diesel and other fuels and oils.
- **Poison** used to kill rats and mice.
- Animals can be poisoned by **salt** if they are not able to drink a lot of water.
- Sometimes **people** deliberately poison animals.

Treating poisoned animals

- Try to discover what caused the poisoning and stop other animals from being poisoned.
- Charcoal mixed with water and given as a drench is a good treatment for poisoning. Give 1 g m for every 20 kg of body weight.
- Kaolin (china clay), a white powder, can be mixed with water and given as a drench. Give 10 gm to a small animal and 200 gm to a horse or camel.

Snake bites

- There are numerous snakes which are poisonous to animals and man. Animals are mainly bitten in the face and legs.
- Usually we discover the animal was bitten by a snake when it is too late to do anything. If you are with an animal when it is bitten, you should examine the animal and move the hair or wool to find the two small, but deep, wounds made by the fangs of the snake.
- You should use a tourniquet to stop the poison from a bite on the leg going through the body.
- Release the tourniquet every 20 minutes to allow the blood to flow. You should send for veterinary help immediately as it will be necessary to give the animal an injection against the snake poison.

4.2. Nutritional deficiencies

Nutritional deficiency anemias develop when micronutrients needed for RBC formation are not present in adequate amounts. Anemia develops gradually and may initially be regenerative but ultimately becomes nonregenerative. Starvation causes anemia by a combination of vitamin and mineral deficiencies as well as a negative energy and protein balance. Deficiencies most likely to cause anemia are iron, copper, cobalamin (B12), B6, riboflavin, niacin, vitamin E, and vitamin C (important only in primates and guinea pigs).

Mineral deficiencies

Copper deficiency

- Known deficient areas such as coastal sandy soils, granite soils, peat swamps (made worse by excess molybdenum or lime application).
- Extended periods on green feed (copper is more available in dry feed).
- Breeding stock.
- Growing stock.

Selenium deficiency

- Known deficient areas such as coastal sandy soils, acidic soils, sedimentary and granite soils, usually in high rainfall regions (made worse by high superphosphate application and clover dominance).
- Lush feed situations.

- Young growing stock.

Cobalt deficiency

- Known deficient areas such as coastal calcareous sands, high rainfall granite soils and krasnozem soils (made worse by lime application and high superphosphate application, especially in lush seasons).
- Young growing stock.

Phosphorus deficiency

- History of very limited superphosphate application on soils naturally deficient in phosphorus.
- Lactating cows.
- Young growing cattle.

Diagnosing and identifying mineral deficiencies

Clinical signs that would lead producers to suspect a mineral deficiency include the following:

- **Copper deficiency -** Rough coat, sandy-colour Hereford or bronze-tinged Angus, poor growth, diarrhoea.
- **Selenium deficiency -**Stiff-legged gait, sudden death, poor growth.
- **Cobalt deficiency -** Ill-thrift, emaciation.
- **Phosphorus deficiency -** Pica (eating bones and other rubbish), poor growth, soft bones and fractures, infertility, post calving red water.

Pasture samples, soil samples and blood samples from affected animals can also be useful, as well as a clinical response-to-treatment trial.

Self-Check -4	Written Test

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

1. List symptoms of poisoning, toxicities and deficiencies (**2 points**)
2. Describe causes of poisoning in animals. (**3points**).
3. What are deficiencies most likely cause anemia ?(**3points**)

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-5	Handle ill and injured animals

5.1. Background

All work on infected animals should be carried out under the physical containment conditions equivalent to the risk group of the microorganisms. The physical containment levels for work with infectious and transgenic animals follow the animal containment.

Animal handling means the knowledge and skills to understand the behaviour and needs of animals in order to manage their movement and effectively restrain them in a manner consistent with their behaviour and needs while ensuring the safety and well-being of both the animal and the handler.Handling animals is an essential part of working in a veterinary clinic. Veterinary nurses and other staff are trained to assist in medical and surgical procedures for animals. They also have experience dealing with animals in pain or distress, which may be liable to bite or scratch as a result of fear.

Animals may be kept at the clinic following surgery, or while undergoing tests to diagnose illness. These animals must be fed and provided with water and clean litter trays. Most veterinary clinics offer animal boarding facilities while their owners are on holiday, and many clinics also provide bathing, grooming or nail clipping services.

In many animal-holding areas, noxious odours, particularly ammonia, are present. Engineering controls should be in place to keep these levels compatible with the health and comfort of workers and the animals. The adequacy of the ventilation system, the design, construction and placement of cages and containers, the numbers of animals housed, the effectiveness of cleaning, and the frequency of bedding changes will all influence the level of odours and allergens such as fibres and animal dander.

Air exchanges within the animal rooms, temperature, humidity, light and noise levels should be maintained within limits compatible with the health and wellbeing of both workers and animals.

5.2. Training and induction

Manual handling is an integral part of animal house work so care is required to minimise the risk of musculoskeletal injury.

All persons involved in the study, handling and care of animals should receive appropriate induction training and information regarding standard work practices, potential hazards and how to deal with them. Written Standard Operating Procedures (SOPs) should include the demarcation and restrictions applying to different areas and animals as well as the routine procedures applicable to each. New workers and researchers should be supervised by animal care staff until they have demonstrated their ability to work with the animals without damage or stress to the animal itself and to themselves.

5.3. Safety and health risks to handlers

Hazards for persons using and handling animals may arise from a variety of sources, including viruses, bacteria, fungi, parasites, ionising and non-ionising radiation, hazardous substances, toxins, carcinogens, allergens, anaesthetic gases and physical injuries.

Prior to any studies being carried out, a risk assessment should be performed and controls put in place to contain hazardous agents and to plan for "worst case" scenarios and emergencies.

The hazards associated with handling animals can be loosely placed in three major categories.

First, **physical injuries** occur from bites and scratches, especially from rodents, rabbits, dogs and cats. The key to prevention of these types of injuries is proper training of research personnel by the animal care staff or other qualified individuals. Laboratory animals are sometimes unpredictable in their nature and response, and any bite, scratch or similar injury should be reported as soon as practicable to the supervisor of the area. Medical advice and subsequent supervision may be needed if an infected animal inflicted the injury.

Secondly, the possibility of **zoonotic diseases** must always be considered. Zoonotic diseases are those that can be transmitted from animals to humans. Although zoonotic diseases are not common, the prevention, detection, and eradication of zoonotic diseases from the animal facility are a primary concern of the entire animal care staff. Remember that tissues as well as the animals can transmit zoonotic diseases.

Thirdly, there are **serious allergic** hazards associated with breathing or contacting animal dander or urine allergens (among others). The safest policy is to reduce exposure by wearing protective clothing (such as facemasks, gloves, and a lab coat) when handling animals. Another hazard, which requires careful attention, is the use of anaesthetic agents.

Self-Check -5	Written Test

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

1. _____animals is an essential part of working in a veterinary clinic. (**2 points**)
2. Describe categories of hazards associated with handling animals. (**3points**).

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Operation Sheet 1	Signs of illness and injury

Recognising animal illness

Step 1. Compile information from the history of an animal.

Step 2. Conduct physical examination.

Step 3. Undertake special testing (if necessary).

Operation Sheet 2	Separate sick and injured animals

Step 1. Separate sick animals from healthy animals.

Step 2. Provide care for sick animal.

Step 3. Prepare record for every animal.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2-3 hours.

Task 1: Recognising animal illness

Task 2: Separating sick and injured animals

List of Reference Materials

1. Federation of Animal Science Societies (2010): Guide for the Care and Use of Agricultural Animals in Research and Teaching.3rd edition.
2. http://www.safety.uwa.edu.au/topics/biological/animal.
3. https://www.acsedu.com/info/pets/animal-care-and-handling/diagnosing-sick-animals.aspx.
4. -https://www.mla.com.au/research-and-development/animal-health-welfare-and-biosecurity/diseases/nutritional/mineral-deficiencies.
5. https://www.msdvetmanual.com/circulatory-system/anemia/nutritional-deficiencies
6. http://www.fao.org/3/T0690E/t0690e0b.htm#TopOfPage.
7. Canadian Committee on Antibiotic Resistance (2008): Infection Prevention and Control Best Practices for Small Animal Veterinary Clinics. 1st edition.

ANIMAL HEALTH CARE SERVICE

NTQF Level -II

Learning Guide -4

Unit of Competence: - Assist General Animal Health care

Module Title: Assisting General Animal Health Care

LG Code: AGR AHC2 M14 LO4-LG-04

TTLM Code: AGR AHC2 M14 TTLM0919v1

LO 4: Assist in stock control and clinic security

Instruction Sheet	Learning Guide # 4

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

- Inventory of veterinary supplies and medicines
- Order Medicines and supplies
- Check clinic stocks
- Handle and store drugs
- Clinic security measures

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

- Take regular inventory of veterinary supplies and medicines according to clinic guidelines.
- Order medicines and supplies under direction of the duty veterinarian and qualified veterinary nurse.
- Check clinic stocks as they are received against quantities ordered and priced.
- Handle drugs and stored securely in accordance with clinic and legislative requirements.
- Use clinic security measures in accordance with clinic procedures.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4 and Sheet 5”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4 and Self-check 5” **in page -98, 100, 103, 107 and 111** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation sheet 1 in page **112**.
6. Do the “LAP test” **in page** – **113**. (If you are ready).

Information Sheet-1	Inventory of veterinary supplies and medicines

1.1. Inventory

Inventory is the **second** largest expense in the veterinary practice, next to the **cost** of **labor**. Profitability becomes a challenge when large expense categories are not constrained to appropriate benchmark levels. Managing the inventory of a veterinary practice involves more than just keeping the shelves stocked. One of the largest expenses, inventory costs often consume between 12 to 15% of the overall practice income. Unless inventory is managed appropriately, the practice stands to lose.

1.2. Inventory Management

One of the basic needs in a veterinary practice is an adequate inventory of drugs and supplies. Effective inventory management is a huge opportunity in veterinary medicine today. Conduct a regular inventory of veterinary supplies and medicines according to clinic policy and procedure. This will help to ensure that you do not run out of important veterinary medications that will be required for the care of your patients.

1.3. Inventory management goals

Two important objectives of inventory management are to ensure that items are on hand when needed, and to minimize the expense of keeping supplies in stock. These two goals hang on a delicate balance; overstocking assures never running out of product, but uses up too much capital, while a lean inventory reduces the expense, but increases the risk of being out of something when needed.

Products sitting on a shelf too long may expire, become damaged or stolen, become obsolete with the introduction of better products, or become shopworn. The effect of time is especially evident with pet healthcare products displayed in the reception area. Products that sit in a display for too long collect dust and labels become smudged and tattered. Clients shun shopworn packages as undesirable, even though their contents may be unaffected, and it sends a very poor message to pet owners.

Another important goal of inventory management is to increase turnover. The rate of inventory turnover is defined as the number of times inventory is used up (“turned over”) and replenished each year. Higher turnover is the goal. The turnover rate should be used as a benchmark for monitoring inventory management progress from year-to-year. Ideally, a practice has no capital invested in inventory.

In a typical veterinary practice, the inventory on hand will include items such as:

- Pharmaceutical drugs
- Medicines and ointments
- Consumable clinic supplies
- Over-the-counter products, such as shampoos, flea and tick products
- Pet food
- Collars, leashes, pet clothing.

The on-farm veterinary medicine inventory should be managed according to the following procedures:

- Purchase drugs in quantities which will be used in a reasonable amount of time.
- Check product expiry dates before purchase.
- Clean and reorganize the drug cabinet on a regular schedule.
- Use products with older expiry dates first.
- Discard all expired products.

1.4. Inventory Location Inventory

Location refers to the organization of your inventory products within your facility. Clinics will tend to have too many locations for products and this makes it difficult to visualize your quantity on hand and will result in the reordering of products that are currently in the practice but that cannot be found because they are in unlikely locations. The next column discusses Inventory Location design.

Self-Check -1	Written Test

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

1. What is inventory? (**2 points**)
2. What are veterinary medicine inventory procedures those should be managed?(**5points**)
3. Write two important objectives of inventory management. (**3points**).

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-2	Order Medicines and supplies

2.1. Ordering

Each clinic will have what they regard as adequate supplies of each product. If adequate supplies are not present when you conduct your inventory, you will need to **order** products from a specialised stockist under the direction of the duty veterinarian or qualified veterinary nurse. Orders may be placed by **fax**, **telephone** or the **internet**

Each clinic will have their preferred stockists of items. Check with your clinic. Who are their preferred stockists for products such as veterinary supplies, stationary, office equipment, etc?

Once you have placed your order, deliveries will usually occur overnight depending on your clinic location and supplier.

Once your order arrives it will need to be unpacked, priced and place away in the appropriate location. This should be done as soon as the products arrive; especially if you have ordered frozen items or items that need to remain under a certain temperature.

When you unpack the items you have ordered it is suggested that you mark the item off your invoice and order as you are placing it away. This ensures that you have received the correct item in the correct quantity and that you have been charged correctly for the items.

Items that are being placed in the reception area or for sale should be marked with the retail price. It is recommended that these items be priced using a removable price sticker placed on the back of the product. Ensure that the sticker does not cover any important information on the product regarding use. Alternately, if your clinic has the facility, you can avoid placing price stickers on products by using the pricing bar code on the back of every product. These bar codes are read by a specialised scanner and the price is registered on the clinic computer system.

Self-Check -2	Written Test

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

1. If adequate supplies are not present when you conduct your inventory, who will order products from a specialised stockist? (**2 points**)
2. What you will do once your order arrives? (**3points**)
3. Write ways of ordering supplies from a specialised stockist. **(3points**)

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-3	Check clinic stocks

3.1. Stock control

- Stock control processes must be in place to ensure medicines are used or disposed of within their shelf life (including their in-use shelf life).
- Good stock control will reduce waste and save money.
- It is an offence to supply or administer an out-of-date medicine.

Efficient stock control allows you to have the right product in the right place at the right time. It ensures that capital is not tied up unnecessarily and protects against problems arising in the supply chain.

It is good practice to:

- Set stock levels to allow accurate stock holding
- Have a named person responsible for stock control
- Store products in original packaging, in a logical order
- Supply a product leaflet
- Dispense products with the shortest expiry date first
- Store products with different batch numbers together.

3.2. Date checking the dispensary

Care should be taken to ensure safe storage of all medicinal products. Medicines must be stored in accordance with the manufacturer or datasheet.

The dispensary should also be fitted with blinds on any windows to protect against bright light, and light sensitive products should be kept in their outer packaging. Ventilation must be adequate, and hot water sterilizers and autoclaves should not be used in the dispensary because they may adversely affect the humidity of the room.

To avoid contamination, medicines should not be stored in toilet or washing areas, or laboratories. Medicines to be supplied to clients should not be stored in areas where animals are kept such as kennels, except those medicines already dispensed.

Flammable products must be stored in an appropriate flammables cabinet specifically designed for this purpose, preferably on the floor to prevent breakages.

Shelving should be of sturdy construction and well designed to reduce the possibility of breakage and spillage. It should be designed in such a way to ensure medicines are easy to locate with areas suitable for small and bulk storage.

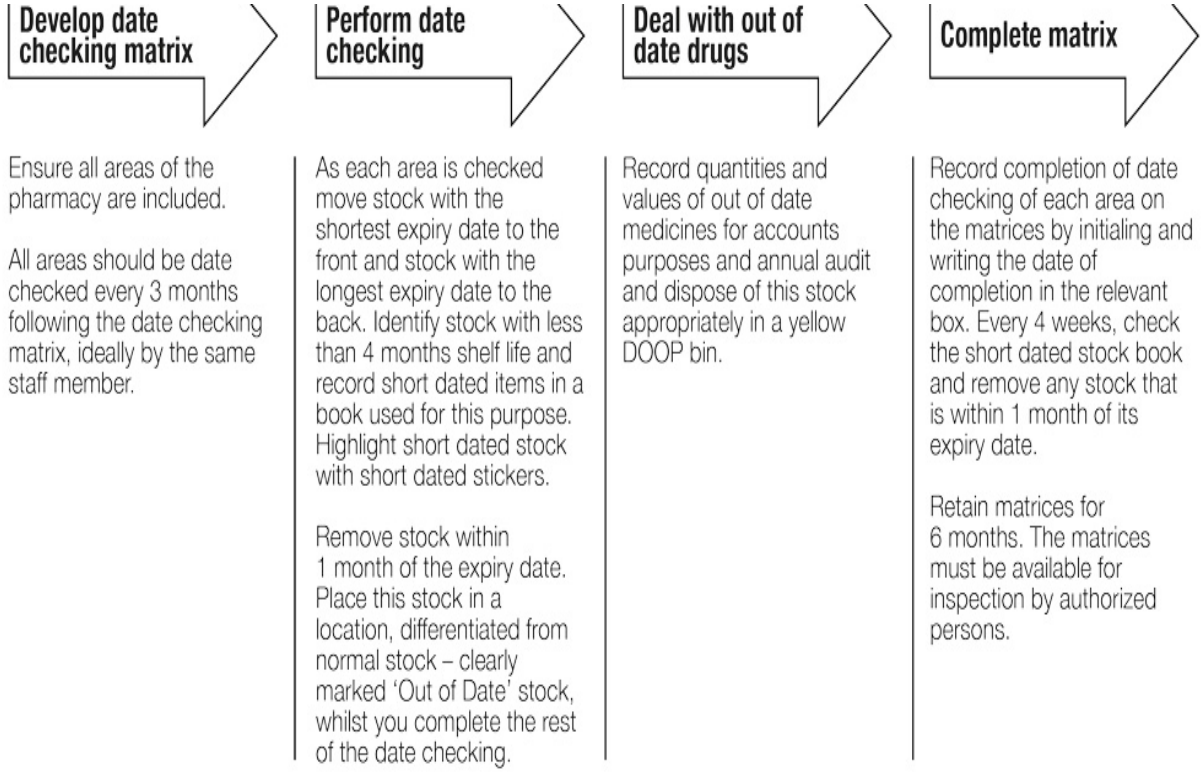


Diagram date checking dispensary

Self-Check -3	Written Test

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

1. Medicines must be stored in accordance with _____or _____. (**2points**).
2. What are the benefits of efficient stock control? (**3 points**)
3. Why the dispensary should be fitted with blinds on any windows? (**3points**).

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-4	Handle and store drugs

4.1. Handling, Storage and Disposal

The veterinarian should inform clients to whom prescription drugs are delivered or dispensed about appropriate drug **handling**, **storage**, and **disposal**.

In the clinic, veterinary prescription drugs should be stored separately from over-the-counter drugs, and be easily distinguishable by the professional and paraprofessional staff. Drugs should be stored under conditions recommended by the manufacturer. All drugs should be examined periodically to ensure cleanliness and current dating.

Food animal clients should be advised that veterinary prescription drugs should be securely stored, with access limited to key personnel.

Proper storage facilities improve medication effectiveness and reduce treatment errors. The ideal location for a storage unit is a clean, dry, frost-free area, such as a farm office or utility room. Animal health products should be protected from changes in temperature, sunlight, dust, moisture, animals, and insects. A clean, organized refrigerator makes an ideal drug storage unit. An example of products affected by incorrect storage temperature is teat dips containing the disinfectant chlorhexidine. These may irritate skin if used after freezing and thawing has occurred. Vaccines containing modified live organisms will have markedly reduced effectiveness if stored at room temperature.

Most antibiotics are heat sensitive. Store these products in a refrigerator at a temperature between 2^0C and 8^0C. to maintain potency. Many other products require storage in a cool (below 15^0C.) but non-refrigerated location. Check product labels for information on acceptable storage temperature.

Product decomposition may result from exposure to light. Manufacturers package light-sensitive products (e.g. injectable tetracyclines) in light resistant containers. These should be kept in a lightproof storage unit. Different classes of products (e.g. antibiotics, vaccines, dewormers, etc.) should be stored on separate shelves. This will further reduce the potential for error in product selection. Label shelves to maintain an organized storage unit. Lock storage units to prevent access by children or

unauthorized individuals.

All veterinary medicines should be stored:

- in a clean and tidy location in accordance with the manufacturer's
- recommendations
- in areas which are not accessible to the public
- in areas which are not accessible to domestic pets
- on appropriate and secure shelving
- in such a way as to be protected from adverse effects of light, temperature, extremes and moisture

Temperature monitoring

Products to be stored at ambient room temperature do not require refrigeration and should be kept between 8°C and 25°C. Storage of products at ambient temperatures should be monitored if the temperature is outside this range or remains unusually high or low for any significant period of time.

Products that require refrigeration such as vaccines, insulin, antisera and some reconstituted antibiotics must be stored in a fridge between 2°C and 8°C. These products should be removed from the delivery cool chain as soon as possible and stored in a fridge. They should only be removed from the refrigerator for immediate use.

Care should be taken to ensure the refrigerator maintains a temperature between 2°C and 8°C. Temperatures should be monitored at least daily, and this should ideally be the responsibility of a named person. Maximum/minimum thermometers and a log book can be used for this purpose. The use of continuous data loggers to monitor the temperature can be convenient, but these should only be used if an audible alarm alerts the user to temperatures deviating from the required range. Monthly or quarterly downloading of the temperatures into graph format is useful to determine trends in temperature fluctuations, but notice of temperatures outside the required range comes too late to prevent the product being used if an audible alarm is not present. Generally data loggers should be downloaded at least weekly.

A written plan should be in place detailing the actions to be taken should temperatures in the dispensary or refrigerator fluctuate outside the recommended temperatures. For example, this may include the direction to dispose of insulin if the temperature drops below 2°C or that further information should be sought from the medicine manufacturer if the temperature of the fridge was maintained above 8°C for longer than a few minutes.

Regular cleaning, servicing and stock control in refrigerators should be performed as for other storage areas**.**

Figure 1: Temperature monitoring digital thermometer.

Proper disposal

Safe disposal of livestock medicines is essential to protect farm employees, family members, untreated livestock, and the environment from accidental exposure to potentially hazardous chemicals.

Many veterinarians and manufacturers will accept returns of products at the location of purchase. Animal pesticides (e.g. dewormers, louse control products, etc.) must be disposed of in an identical manner to crop pesticides. Never reuse livestock medicine containers. Store containers for discarding in a way which prevents access by children, livestock and pets. Most washed containers (with the exception of pesticide.

Self-Check -4	Written Test

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

1. Safe disposal of _____ is essential to protect farm employees, family members, untreated livestock, and the environment from accidental exposure to potentially hazardous chemicals.(**1point)**
2. What should be seems ideal location for a storage unit? (**3 points**)
3. What is the range of temperature to store heat sensitive antibiotics products in a refrigerator to maintain potency?(**1points**)

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

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-5	Clinic security measures

5.1. Purpose of Security

There is a lot of misunderstanding in the veterinary profession about security and violence prevention. Some folks believe the veterinary practice is not a high risk target for violence and therefore security measures are not warranted. Some believe that the addition of security measures will give the practice a “fort-like” atmosphere. And still others believe that security precautions create too much of an inconvenience for the staff and are not worth the effort.

The reality is that most security procedures don’t cost a lot of money and integrate easily into everyday operations.

The most effective and unobtrusive security program includes a “layered” approach. The four basic layers of security in a veterinary practice are:

• **Procedures.** When we concentrate on getting the job done, we sometimes forget about other things. That’s human nature. But humans also operate on a level that is basically a set of habits. If we establish procedures for security as part of the everyday operating protocol, the staff is more likely to follow them.

In most cases where violence in the workplace happens, the investigation usually reveals that a key procedural safeguard was bypassed or omitted. Therefore procedural policies must be reinforced by leadership with actions such as discipline when violations occur.

Procedural security includes things like keeping doors locked when necessary, counting the day’s receipts away from the front desk, and establishing a safety routine for when folks must work alone.

• **Physical Barriers**. A locked door is often the best defense against someone trying to hurt you. In general, the protective “barrier” around the whole practice is the facility with supervised, controlled entrance points. Inside the building, there should be designated “safe rooms” throughout the facility that can be used in case another

employee or a visitor becomes violent. Safe rooms should have a sturdy, lockable door (preferably swinging outward of the room) and access to a telephone so that staff members can barricade themselves inside and summon assistance.

Physical barriers are the primary prevention and defense tool in your arsenal, but a door or a lock is of no use if it isn't used properly and consistently!

• **Early Warning**. Using door chimes and even cameras to alert the staff that someone has entered their "protected zone." Although this is not a replacement for physical barriers, having just a few seconds advance warning of impending violence may make the difference between an incident and and tragedy!

• **Summoning Assistance**. If all the precautions fail, there has to be a way for the staff to summon assistance quickly and easily. In some cases, the telephone is adequate, but in high risk situations, there may be a need for more.

And security isn't just to keep people out of the practice. By some accounts, as much as 10% of "losses" in a veterinary practice are the result of employee theft. That isn't to say that all employees are dishonest, but it's a fact that some people will take things that don't belong to them if given the chance. Security must address both external and internal risks.

Some security precautions are visible to clients and the general public as a deterrent to crime...things like cameras and signs. But some security procedures like training and background checks are "transparent" in an attempt to avoid problems or prevent them from escalating when they do happen**.**

5.2. Personnel protection

This covers protection from:

- aggressive clients
- threats to personal safety for staff working late in the clinic
- injury from animals
- workplace hazards.

Some workplaces have 'panic buttons' installed which can be activated in response to serious personal threat such as an armed hold-up. Activation should lead to immediate response by the police. Are there any situations in your workplace that

could raise concerns for the personal safety of the staff? If so, what mechanisms are in place to deal with them?

5.3. Patient security

This includes:

- Adequate restraint of animals to prevent injury to handlers and animals
- Prevention of escape
- Isolation of animals with infectious diseases

5.4. Security measures in the veterinary clinic

Strategies to prevent or minimise theft:

- good lighting within the building and the car park
- alarm systems
- positioning merchandise away from doors and open windows
- positioning merchandise where there can be adequate surveillance by staff
- secure lockable till with limited staff access
- maintain a small float in the till
- lockable safe out of public view
- secure storage of S8 medicines and anabolic steroids

Practice security involves safe guarding:

- money
- medicines
- personnel property
- personnel well being
- loss of and/or injury to animals
- client confidentiality.

Self-Check -5	Written Test

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

1. What are strategies to prevent or minimise theft in a veterinary clinic? (**2 points**)
2. List out procedural security .(**5points**)
3. Write patient securities. (**3points**).

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Operation Sheet 1	Check clinic stocks

Dating checking dispensary

Step 1. Check all areas every 3 months following the date checking matrix, ideally by the same staff member.

Step 2. Check move stocks with the shortest expiry date to the front and stock with the longest expiry date to the back.

Step 3. 'Out of date 'stock, whilst you complete the rest of the date checking.

Step 4. Record quantities and values of date medicines for accounts purposes and audit and dispose of this stock appropriately in yellow DOOP bin.

Step. 5. Record completion of date checking of each area on the matrices by initialing and writing the date of completion in the relevant box.

Operation Sheet 2	Handle and store drugs

Store drugs

Step 1. Clean and organize drug storage unit.

Step 2. Check product labels for information on acceptable storage temperature.

Step 3. Store different classes of products like antibiotics, vaccines and dewormers, on separate shelves.

Step 4. Label shelves to maintain an organized storage unit.

Step 5. Lock storage units to prevent access by children or unauthorized individuals.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2-5 hours.

Task 1: Apply date checking dispensary

Task 2: Perform storing drugs

List of Reference Materials

1. "https://www.safetyvet.com/OSHA/security.htm. Safety Vet "Solutions for the Veterinary Professions”
2. -http://nasdonline.org/1665/d001555/proper-storage-of-veterinary-medicines.html
3. http://veterinaryhospitaldesign.dvm360.com/security-measures-veterinary-clinic. Security measures in the veterinary clinic, 2019.
4. https://www.vet-advantage.com/best-practices/inventory.