

Credits: 6

Learning hours: 60

Sector: Agriculture and Food processing



Sub-sector: Animal health

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Purpose statement

This module covers the knowledge, skills and attitudes required to prevent diseases for the following species: cow, sheep, goat, pig, poultry, rabbit, dog and cat. The workplace in which this competence may be applied range from veterinary clinics, animal housings/shelters, farms, customs services to slaughterhouses. It's a prerequisite for all the specific modules of the qualification involving the manipulation and treatment of the different species mentioned above. Upon completion of this module, the trainee will be able to: Monitor physical conditions of animal housing; Restrain animals for veterinary intervention; Perform animal general examination; Use antiparasitic drugs for disease prevention.

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GENERAL INTRODUCTION

Animal diseases pose a risk to public health and cause damage to businesses and the economy at large. Farmers and the government therefore take every precaution to prevent these diseases, such as keeping animal housing clean and vaccinating livestock.

Infectious animal diseases cause major losses to livestock production. A significant number of them can easily be spread to human e.g. as food-borne infections, and to wildlife. Infectious diseases are also a major cause of poor animal welfare. Within livestock production, it is too late to undertake actions only after clinical signs of disease have developed. Instead, a continuous focus on disease prevention is needed, which also minimises the need for use of antimicrobials and any subsequent risks of problems with antimicrobial resistance.

Prevention is the first line of defense against disease. At least four preventive techniques are available for use in the prevention of disease in an animal population:

- One is the exclusion of causative agents of disease from specific geographic areas, or quarantine.
- A second preventive tool utilizes control methods such as immunization, environmental control, and chemical agents to protect specific animal populations from endemic diseases, diseases normally present in an area.
- The third preventive measure concerns the mass education of people about disease prevention.
- Finally, early diagnosis of illness among members of an animal population is important so that disease manifestations do not become too severe and so that affected animals can be more easily managed and treated.

This module aims at equipping teachers/students with the major elements involved in the prevention and control of infectious diseases and principles and strategies for their use. It also connects theory on livestock diseases prevention and the field practices that will help the users of this module to have hands-on in terms of animal diseases prevention. Some details on infectious agents that cause major animal diseases in Rwanda are herein described at large so that teachers and students may be aware of how animal diseases are spread.

Learning Unit 1. Monitor physical conditions of animal houses

LO 1.1 – Select materials tools and equipment to monitor animal housing physical conditions.

Proper housing and management of animal facilities are essential to animal well-being, to the quality of research data and teaching or testing programs in which animals are used, and to the health and safety of personnel. A good management program provides the environment, housing, and care that permit animals to grow, mature, reproduce, and maintain good health; provides for their well-being.

Many factors should be considered in planning for adequate and appropriate physical and social environment, housing, space, and management. These include

- The species, strain, and breed of the animal and individual characteristics, such as sex, age, size, behavior, experiences, and health.
- The ability of the animals to form social groups with conspecifics through sight, smell, and possibly contact, whether the animals are maintained singly or in groups.
- The design and construction of housing.
- The availability or suitability of enrichments.
- The project goals and experimental design (e.g., production, breeding, research, testing, and teaching).

• Topic-1:Types of materials, tools and equipments to monitor animal houses physical conditions.

- ✓ **Thermometer:** Thermo (**heat**) and meter (measuring device), It is a tool that measures temperature how hot or cold something is. Thermometers are used to see if animal has a **fever** .
- ✓ **Hygrometer** : To identify the humidity in the environment, Used to identify water vapour present in the gaseous mixture.
- ✓ **Anemometer:** To measure the pressure, the flow of the wind and the direction of the wind.
- ✓ **Pluviometer** : Also called **Rain gauge** is an instrument used to gather and measure the amount of liquid precipitation over an area in a predefined period of time.
- ✓ **Barometer:** device used to measure atmospheric pressure
- ✓ **Digital Oxygen Analyzer:** used to measure the purity of the blanket gas
- ✓ **Digital Ammonia meter:** is a portable, handheld ammonia gas detector that is ideal for the workplace such as poultry farms

- ✓ **Digital CO2 Analyzer:** measures carbon dioxide, temperature and humidity. The CO2 analyser measures the CO2 content of the air, the relative humidity and the room temperature.

LO 1.2 Monitor bio-physical parameters

It is very essential to provide appropriate conditions for rearing animals in the tropics by reducing the extreme effects of climate such as heat, and moisture. Good housing and layout of the farm can reduce stress. Environmental control improves milk production by reducing stress and disease hazards, also making management easier. In conjunction with a good herd health management program, housing can be a main determinant of productivity.

- **Topic-1: Temperature**

The over-riding environmental factor affecting the physiological functions of domestic animals is temperature. For most farm animals a mean daily temperature in the range 10 to 20°C is referred to as the "**comfort zone**". In this range the animal's heat exchange can be regulated solely by physical means such as constriction and dilation of blood vessels in the skin, ruffling up the fur or feathers and regulation of the evaporation from lungs and skin. At the upper and lower critical temperatures the physical regulation will not be sufficient to maintain a constant body temperature and the animal must, in addition, decrease or increase its metabolic heat production.

A further decrease or increase in temperature will eventually bring the temperature to a point beyond which not even a change in heat production will be sufficient to maintain homoeothermy.

A very young animal, lacking fully developed temperature-regulating mechanisms, particularly the ability to increase heat production by increased metabolism, is much more sensitive to its thermal environment and requires higher temperatures.

- **Topic-2: Ammonia level**

Ammonia (NH₃) – Ammonia is a product of bacteriological processes in the manure. It is easily bound to water. Ammonia is lighter than air and thus it rises in the air. The ammonia content of the poultryhouse air depends on

ventilation, temperature, relative humidity and stocking density. High ammonia concentrations irritate the mucous membranes.

- **Topic-3:Carbon dioxide level**

Carbon dioxide (CO₂) – The carbon dioxide in poultry houses largely originates from air exhaled by the birds. The CO₂ content of the air is used to measure the effectiveness of ventilation.

To reduce heat stress situations, farmers should have well designed housing with good air movement and shade. Handling animals during periods of high temperatures and humidity, should be avoided and provide good quality, cool drinking water provided at all times. An area as pasture for cattle to exercise, aids health care. Resting or exercises areas should be close to the milking shed.

- **Topic-4Ventilation**

Openings provide air movement past the **animals** to remove excess heat and reduce typical drops in milk production during extremely high temperatures. Circulating fans may be required during extremely hot weather to increase airflow

- **Topic-5: Monitoring techniques of bio-physical parameters**

Animal micro and macro environments need to be monitored to maintain balanced and harmonious environmental conditions. The following is a description of the two types of environments.

- ✓ The **microenvironment** of an animal is the physical environment immediately surrounding it the primary enclosure with its own temperature, humidity, and gaseous and particulate composition of the air.
- ✓ The physical environment of the secondary enclosure—such as a room, a barn, or an outdoor habitat constitutes the **macroenvironment**. Although the microenvironment and the macro-environment are linked by ventilation between the primary and secondary enclosures, the environment in the primary enclosure can be quite different from the environment in the secondary enclosure and is affected by the design of both enclosures.

Measurement of the characteristics of the microenvironment can be difficult in small primary enclosures. Available data indicate that temperature, humidity, and concentrations of gases and particulate matter are often higher in an animal's microenvironment than in the macro-environment.

The best instrument for measuring temperature is the animal itself. Assessing the temperature by observing the animals themselves should only be done when the animals are at rest, not when they are active or eating. Measuring the temperature is the most common way of assessing the climate in a house. Such a measurement can give a lot of useful information and is not expensive or hard to do.

LO 1.3 – Apply corrective measures to bio-physical conditions

- **Topic-1: Corrective measures techniques and method**

Temperature

When temperatures are not within the comfort zone, birds have several mechanisms which enable them to keep their body temperature constant without having to produce extra heat. This is referred to as physical heat regulation and factors that influence physical heat regulation include:

- ✓ **Tissue insulation** – for example if brds have a layer of subcutaneous fat, they can afford to let their skin temperature drop.
- ✓ **Changing body position and huddling** – animals/birds can effectively regulate heat loss through body position.
- ✓ **Vaporisation of water** – if temperatures are high or extremely high, sensible heat loss is minimized.

Relative humidity

The following concepts are used to measure the humidity of air in poultry houses:

- ✓ **Absolute humidity** = grams of moisture present in 1 m³ of air.
- ✓ **Maximum humidity** = maximum grams of moisture that can be present in 1 m³ of air at a given temperature.
- ✓ **Relative humidity** = the relationship between the moisture content of the air and the maximum moisture content at the current air temperature expressed in percentages.

Ammonia and carbon dioxide level

The most important components of air are nitrogen (N₂) and Oxygen (O₂). They represent approximately 79% and 20.3% respectively. In addition to these main components there are several other gasses such as carbon dioxide (CO₂), and water (H₂O).

To reduce ammonia emission from the animal house it is necessary to control the operation factors of the ventilating and heating system in order to keep the ventilation rate, indoor air temperature and air flow over the manure surface as low as possible. At the same time, the ventilation system must maintain an acceptable indoor air quality to comply with the animal welfare requirements.

-  Heating
-  Cooling
-  Drying
-  Vaporization
-  Forced Ventilation
-  Opening
-  Closing
-  Cleaning
-  Changing of bedings
-  Respect animal stocking density standards

L.O1.4. Calculate the stocking density

The stocking density for each animal species is defined as the number of animals which can live on a specific unit area taking into account the animal species and the age and some other environmental factors.

- ✓ An animal's space needs are complex, and consideration of only the animal's body weight or surface area is insufficient.
- ✓ Vertical height, structuring of the space and enrichments can clearly affect animals' use of space.
- ✓ Space allocations should be reviewed and modified as necessary to address individual housing situations and animal needs (for example, for prenatal and postnatal care, obese animals, and group or individual housing).
- ✓ At a minimum, an animal must have enough space to turn around and to express normal postural adjustments, must have ready access to food and water, and must have enough clean-bedded or unobstructed area to move and rest in.

Table: Recapitulation of the stocking density of different animal species

5.7. Farm animals and equidae

Species and weights	Minimum floor area sq m per animal When housed in groups	When housed singly	Minimum length of feed rack or trough per head m
Pigs			
up to 30kg	1.0	2.0	0.20
30 to 50kg	1.3	2.0	0.25
50 to 100kg	2.0	3.0	0.30
100 to 150kg	2.7	4.0	0.35
over 150kg	3.75	5.0	0.40
Adult boar	—	7.5	0.50
Sheep and goats			
up to 35kg	1.3	2.0	0.35
over 35kg	1.9	2.8	0.35
Cattle			
up to 600kg	1.5	2.2	0.30
60 to 100kg	1.6	2.4	0.30
100 to 150kg	1.9	2.8	0.35
150 to 200kg	2.4	3.6	0.40
200 to 400kg	3.8	5.7	0.55
over 400kg	5.3	8.0	0.65
Adult bull	—	16.0	0.65
Horses, donkeys and crossbreeds			
Height at withers			
up to 147cm	—	12	—
148 to 160cm	—	17	—
Over 160cm	—	20	—

5.8. Birds

Species and weights	Minimum floor area sq cm per bird When housed in groups	When housed singly	Minimum height cm	Minimum length of feed trough per bird cm
Chickens and ducks				
up to 300g	250	350	30	3
300 to 600g	470	700	40	7
600 to 1200g	830	1250	50	10
1200 to 1800g	950	1450	50	12
1800 to 2400g	1200	1700	55	12
over 2400g	1900	2800	75	15
Quail				
up to 150g	250	350	20	4
150 to 250g	250	400	25	4
Pigeons				
	800	1225	35	5

Learning Unit 2 – Restrain livestock animals for veterinary intervention

LO 2.1 – Assess animal behavior signals

- **Topic-1: Assessment of animal behaviour**

Behaviour is any response to a stimulus. It can be any externally observable activity of an animal, or an internal change. The study of animal behaviour, called **ethology**, is a broad field, encompassing both instinctual and learned behaviours as well as abnormal behaviours. That study provides a foundation for animal training, or more generally, animal care. It also provides very real insights and a foundation for understanding human behaviour. Animals do share some behavioural characteristics with people but it can be dangerous to assume too much similarity. Animal behaviour is far less affected by choices reached through reasoning.

- **Topic-2: General animal behaviors according to species**

Animal behavior includes all the ways **animals** interact with other organisms and the physical environment. **Behavior** can also be defined as a change in the activity of an organism in response to a stimulus, an external or internal cue or combo of cues.

- The herd's day involves maintenance **behaviour**: standing, walking, lying, feeding, drinking, self-grooming, allogrooming, agonistic **behaviour** and ruminating. Grazing is affected by temperature. In very high temperatures **cattle** will graze predominantly at night.
- The most important features of the **behaviour of sheep** are their marked sociality and the bond formation between mother and young. **Sheep** show a strong need to stay with their group (or subgroup for some breeds), and become very vocal and agitated when separated from their flock mates.
- Goats are more aggressive and inquisitive than sheep and tend to demonstrate **dominance** within a social grouping more than sheep. Goats display their **dominance** by lowering the head and pointing their horns at the subordinate animal.
- **Pigs** are social animals that under free-ranging conditions live in groups of approximately eight individuals. The groups typically consist of three sows and their offspring. Boars are solitary.
- Fowls are a gregarious species with an elaborate social **behaviour** based on a definite group structure when kept in flocks. They maintain personal space by communication via postural changes. Important signals are associated with the position of the head and the relative angles of the head and the body to other birds.
- Common or everyday behaviour displayed by rabbits including **chinning**, thumping, eating droppings, **growling**, nudging, flopping, binkyng

- Dog-dog. Play between dogs usually involves several behaviors that are often seen in aggressive encounters, for example, nipping, **biting** and **growling**. It is therefore important for the dogs to place these behaviors in the context of play, rather than **aggression**.
- What is normal cat behaviour? Every cat is unique, however unusual levels of **grooming** or hiding or changes in eating or toilet routines are causes for concern. As is sleeping in a hunched pose, and **spraying** indoors. Aggressive or unsociable behaviour is also a sign of an unhappy or unwell cat

Within any particular species of animal, certain behaviours may be present in all members while others are more specific to certain individuals, locations or situations. Even the most simple of life forms exhibit behavioural activity.

- ✓ Birds and wasps build nests to have a safe place to store their eggs and raise their young. Many other animals build nests for the same reason. Animals protect their young in other ways, as well. For example, a mother dog not only nurses her puppies. She also washes them with her tongue and protects them from strange people or other animals. All of these behaviours help the young survive and grow up to be adults.
- ✓ Rabbits run away from foxes and other predators to stay alive. Their speed is their best defence. Lizards sun themselves on rocks to get warm because they cannot produce their own body heat. When they are warmer, they can move faster and be more alert. This helps them escape from predators, as well as find food.

In companion animals, behaviour problems weaken the pet-owner bond, resulting in a decreased owner commitment to pet care. They are a primary reason for pet relinquishment and euthanasia. Yet studies show that many owners do not report behaviour changes to their veterinarian, and most veterinarians neglect to inquire about them. Thus, screening for any behavioural changes or emerging behaviour problems should be done at each veterinary visit to ensure that the behavioural health, physical health, and welfare of the pet are being effectively and humanely managed.

All of these animal behaviours are important. They help the animals get food for energy, make sure their young survive, or ensure that they survive themselves. Behaviours that help animals or their young survive increase the animals' fitness.

- **Topic-3: Maternal Behaviour of Beef Cows**

Maternal care consists of a wide range of activities directed towards the young by the mother. Basically, maternal care represents the mother's willingness to sacrifice her time, energy and resources towards the rearing and protection of her offspring.



- **Topic-4: Behavioural signs**

1) Indicators of stress

Stress is a normal part of life for any animal. For example, hunger is a form of stress that reminds us to eat; fear is a stress-related emotion that helps us avoid potentially harmful situations. However, when we put our dogs in stressful situations that they cannot escape, problems can occur.

❖ Stress Yawn

This usually happens repeatedly in stressful situations, and is done with more intensity than a "sleepy" yawn.



❖ **Panting**

Normally, dogs pant. Panting is a way of regulating body temperature. Therefore, if it is a cool day and your dog has not been engaging in much physical activity and is panting as if she just ran a few miles, this is likely a sign of stress.

❖ **Aggression in Cattle**

Aggression in cattle is usually a result of fear, learning, and hormonal state. Aggression between cows is worse than that between bulls. Horned cattle will bunt (push or strike with the horns) and strike an opponent on the side. Polled cows will use their head as a battering ram. Dairy bulls are generally more aggressive than those of beef breeds, as well as being larger.

2) Confidence and willingness to be approached gestures

❖ **Cross-Fostering**

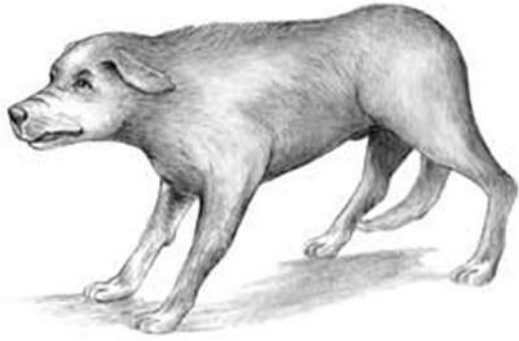
Dairy cows are more likely to refuse a new or unfamiliar calf than beef cows. Bonding between the cow and calf is based on foetal fluid and visual cues; therefore, covering the new calf with drapes soaked with amniotic fluid or the skin of the cow's own dead calf or blindfolding the cow can help. Encouraging the cow with food rewards can also help.

❖ **Reluctance to Enter the Milking Parlour**

Reluctance to enter the milking parlour is a problem related mainly to management. When dairy cows accustomed to milking with simultaneous feeding in a stanchion barn are moved to free stalls and are not fed when milked, they may refuse to enter the parlour.

3) Defensive gestures

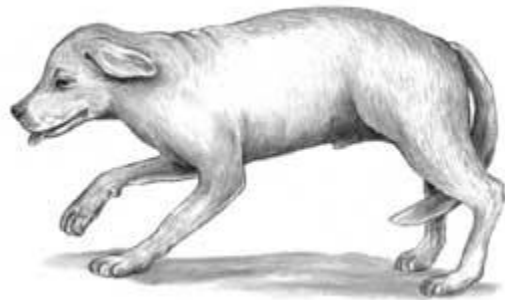
- Be very concerned about dogs in defensive threat posture.
- These dogs are showing signs of fear or submission and aggression.
- Dogs displaying this behaviour are afraid and may attack if pushed.
- This is the posture assumed by fear-biters, dogs who bite out of fear.



4) Submissive gestures

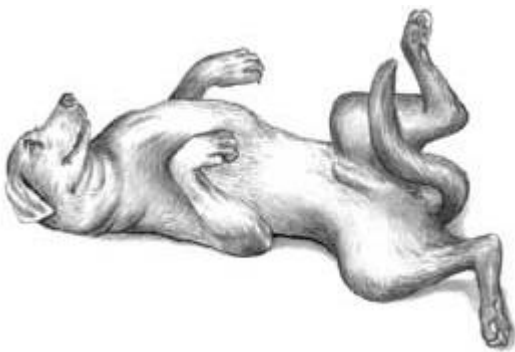
✓ Active Submission Posture

A dog displaying active submission behaviours is offering signs of submission to a superior dog or person to avoid any additional threats or confrontations. This dog is a bit fearful and hopes the superior individual will either retreat or show signs of friendliness.



✓ Passive Submission Posture

A completely submissive dog is very afraid of a confrontation. He is signalling to the dominant individual absolute surrender assuring that he is of no threat.



LO 2.2 –Select restraining techniques

- **Topic-1: The purpose of restraining**

The method used should provide the least **restraint** required to allow the specific procedure(s) to be performed properly, should minimize fear, pain, stress and suffering for the **animal**, and should protect both the **animal** and personnel from harm.

- **Topic-1: Types of restraining techniques**

Safe and effective animal handling and restraining requires a thorough understanding of the normal behavior and responses of each species. Below is some general information on animal behavior and handling techniques. There is no substitute, however, for careful observation and experience.

Psychological/Verbal restraint

This is the least restrictive type of restraint and would be used in combination with other types of restraint. Using a soft, soothing voice while gently stroking the patient will help calm and sooth them. Many dogs know some commands or can at least recognise authority, even if the command is unfamiliar. Commands such as SIT, STAY, COME, DOWN, NO or even HEEL may be useful tools to encourage a dog to cooperate. Also, soft quiet words can calm a frightened animal. Yelling or screaming should never be used as it can cause the animal to become more fearful or aggressive.

Physical Restraint

It consists of the use of manual or mechanical means to limit some or all of an animal's normal movement for the purpose of examination, collection of samples, drug administration, therapy, or experimental manipulation. Physical restraint can be accomplished manually or with devices such as stocks, head gates, stanchions, or squeeze chutes.

Physically controlling or restraining an animal may include using equipment such as:

- Muzzles. May be purpose-made or improvised, and often used for dogs
- Slip leads. Can be used to control a non-aggressive dog
- Rigid leads or graspers
- Snake tongs or graspers
- Nets
- Extension poles

- Towels, cloths or blankets. ...
- Halters.

- **Topic-1: Use a crush**

Cattle are large animals that can behave unpredictably, especially when they are not used to being handled. It is important to always bear this in mind, and to take all possible precautions to ensure your safety and the safety of those working with you.

Crush purpose

A cattle crush, squeeze chute, standing stock or simply stock is a strongly built stall or cage for holding cattle, horses, or other livestock safely while they are examined, marked, or given veterinary treatment. Cows may be made to suckle calves in a crush. For the safety of the animal and the people attending it, a close-fitting crush may be used to ensure the animal stands "stock still". The overall purpose of a crush is to hold an animal still to minimise the risk of injury to both the animal and the operator while work on the animal is performed.

Construction of a basic crush

Crushes were traditionally manufactured from wood; this, however, was prone to deterioration from the elements over time, as well as having the potential to splinter and cause damage to the animal. In recent years, most budget-quality crushes have been built using standard heavy steel pipe that is welded together, while superior quality crushes are now manufactured using doubly - symmetric oval tubing for increasing bending strength, bruise minimisation and stiffness in stockyard applications.





Technique for using a crush

Cattle crushes may be fully fixed or mobile; however, most crushes are best classified as semi-permanent, being potentially movable but designed to primarily stay in one place.

kicking



Preventing

There are several techniques which may be useful to prevent the animal kicking you (usually with the hind limbs):

- ✓ The most common method used to prevent kicking is lifting the tail.
- ✓ It is possible to tie the back legs together using a 'hobble' to prevent kicking to an extent. However, it may be difficult to remove the hobbles if the animal goes down for some reason.
- ✓ Tying a rope around the animal with the rope passing over the transverse processes of the sacrum can be a very effective way of discouraging kicking, and does not require an assistant so is useful for lengthy procedures such as stripping out a mastitic quarter.

With all restraint techniques it is crucial to ensure that the restraint is appropriate to the size and temperament of the animal you are dealing with - you would not examine a fractious bull without a very solid crush, but it is also not acceptable to force up the tail of a quiet animal 'just in case'. Small calves may best be restrained in lateral recumbency rather than standing - this is usually quite well tolerated.

Prolonged Restraint is defined as physical restraint of a conscious animal lasting longer than 30 minutes.

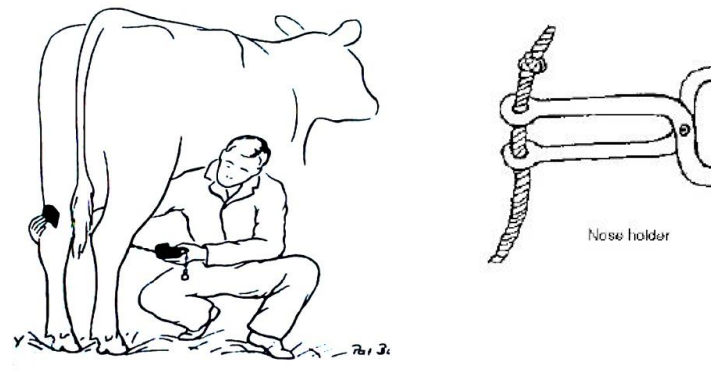
1) Restraining the Cattle

Cattle restraint techniques are designed to divert attention from where you want to treat and prevent kicking and make possible some special procedure.

✓ Nose Lead technique

Lift the animal's head fairly high and pull towards the side opposite that on which you intend to work. Apply pressure on the bridge between the nostrils to cause temporary pain in the sensitive tissues between the

nostrils.



✓ Heads Restraint technique

The head is the first and most important area to restrain as it can seriously injure the handler when it is violently tossed about. The animal is much more likely to be still with its head restrained. Manually grasp the bridge between the nostrils with the thumb and forefinger of one hand and hold it firmly. With the other hand, hold the horn rear.

✓ Milking Hopples technique

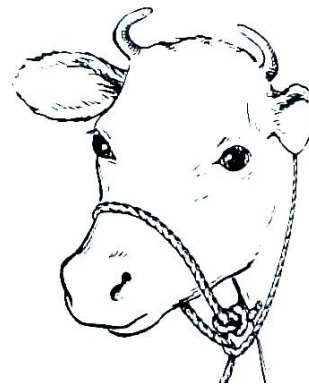
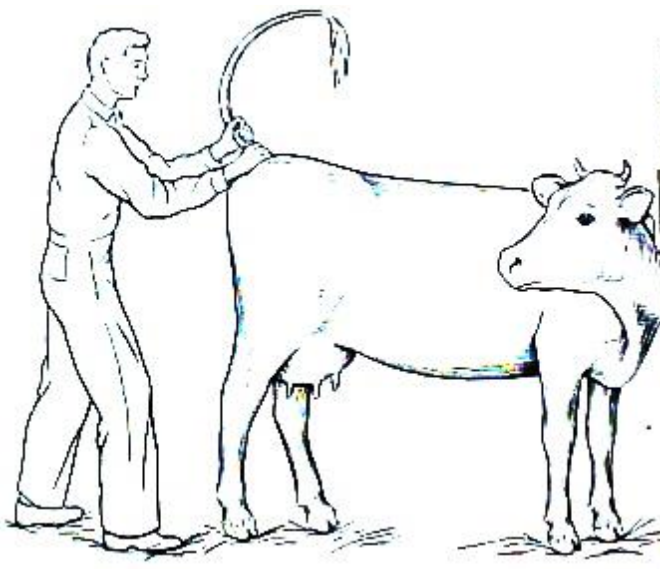
Apply the figure “8” just above the hock to prevent kicking while milking. It prevents a cow from raising the rear legs and thus prevents kicking.

✓ **Legs raising technique**

First apply a nose lead. Grasp the legs at the pastern with the left hand. With the left shoulder push the cow's flank to shift her leg to the other near legs, at the same time raise the rear leg.

✓ **Tail restraining technique**

You may apply the tail restraint whenever it is necessary to distract cow's attention from another part of her body on which work is being done. It may be used when giving udder injections to a nervous cow. Keep both hands close to the base of the tail as much as possible. Stand to the side of the cow to avoid being kicked and apply a lifting force on the tail. It should be gentle but firm.



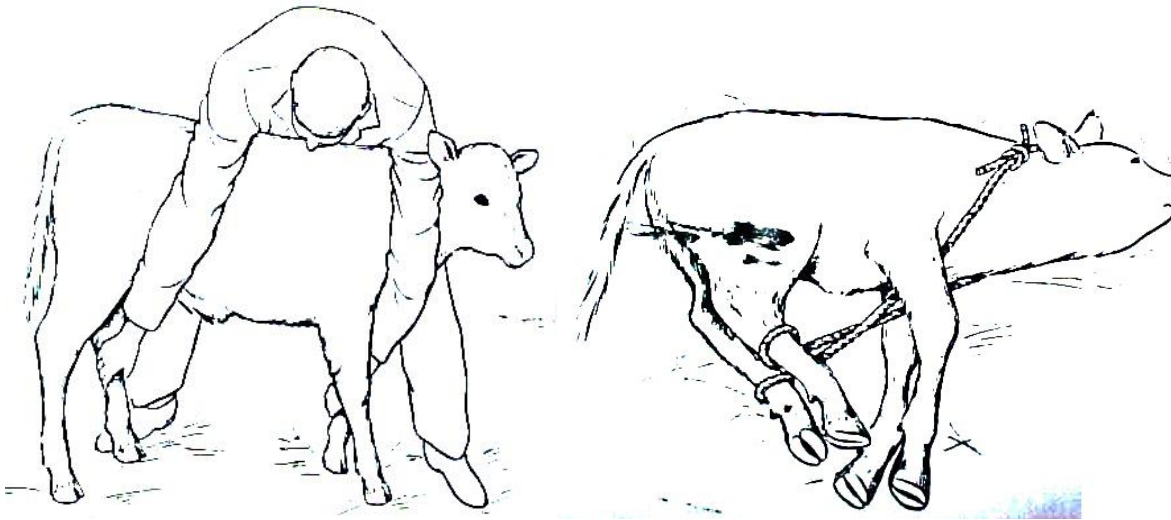
✓ **Temporary halter**

The temporary halter is used when a permanent halter is not available.

To make halter, loop the rope around the cow's neck and secure the loop with a bowline knot. Make a bight in the standing long part of the rope. Pass the bight through the loop and over the nose.

Calves restraining technique

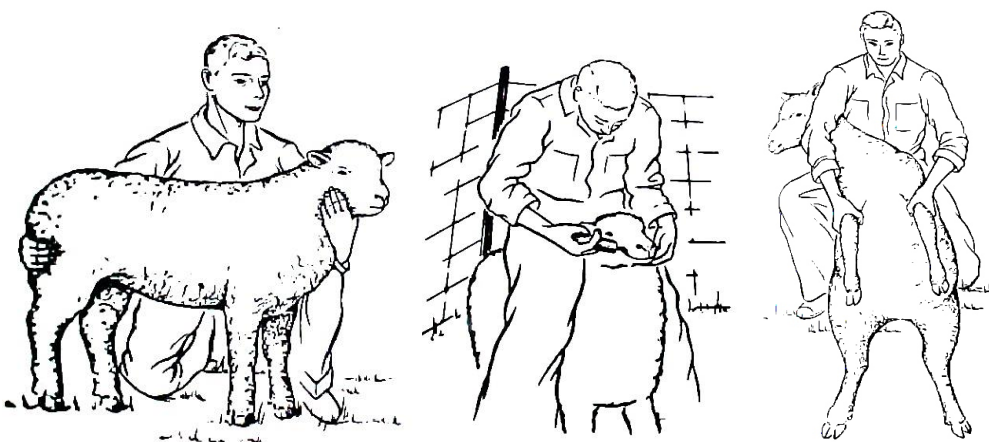
Reach across the animal's back and pull the legs on the side closest to you outward. Calve is then eased down to the ground with the weight against your legs, so that it falls to the ground gently. You should never cast a calf by pulling its leg quickly from under its body so that he falls hard on its side. A very young animal, it may be injured in that way.



Keep your knees against the calf's back to hold it down. Place the center of your rope over its back legs. Bring both ends back between the legs, cross the two ends and carry them between the front legs. Take the rope over the back of the neck.

2) Restraining techniques in goats and sheep

Do not attempt to keep sheep or goat from moving by pulling on its head, horn or hide. He will quickly become excited and resist.



Restraining a sheep or goat in-between the legs with one hand supporting the head. The method demonstrated above is an excellent way to treat large flocks.

3) Restraining technique for pigs

Pigs are stubborn animals. They have definite ideas of their own and are extremely individualistic. Every pig is different from the other. What apply to one may not apply to the other in the same pen or herd.

Pig can be restrained by two methods:

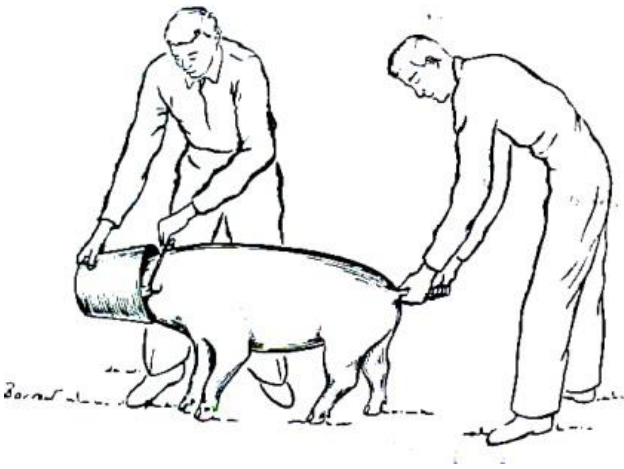
a) Catching method

- ✓ **Hurdling:** Trap the pigs between solid barriers to restrict movement of the pigs. Catch the large ones among the pigs with pig catcher rope when trapped. It is advisable to handle young one with care in other not to cause dislocation of the bones.
- ✓ **Trap or confinement:** Individual pigs may be driven into confinement and selectively restrained with effective use of rope.
- ✓ **Pig Catcher:** Catch the rear legs in the clamp of the pig catcher and pull the rope to hold it, tight around the legs.
- ✓ **Use of Bucket:** Move a large pig covering its face with buckets and moving it in the reverse direction.
- ✓ **Snubbing rope:** The rope behind the tusks is snubbed to a post as the pig pulls back.

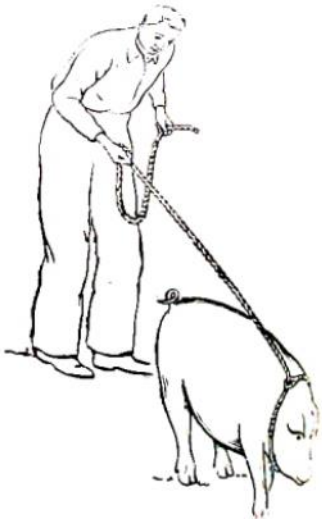
b) Special restraining method

Hug snare twitch: The twitch used for pigs is usually made up of a very long pole with a wire loop. Place the twitch over the upper jaw behind the tusks and apply gentle but firm pressure that is painful enough to prevent resistance or backward movement.

Use of bucket



Use of lead to restrain a large pig



Holding piglet



4) Poultry restraints

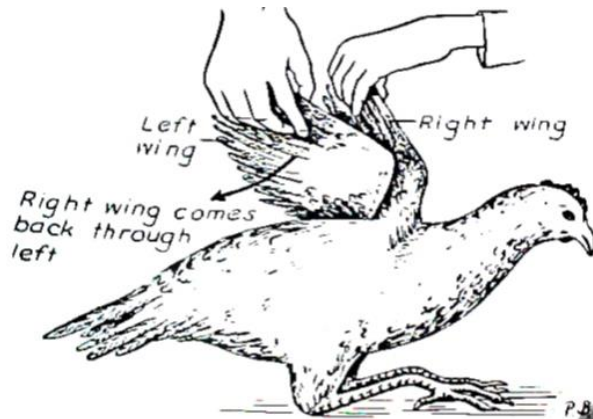
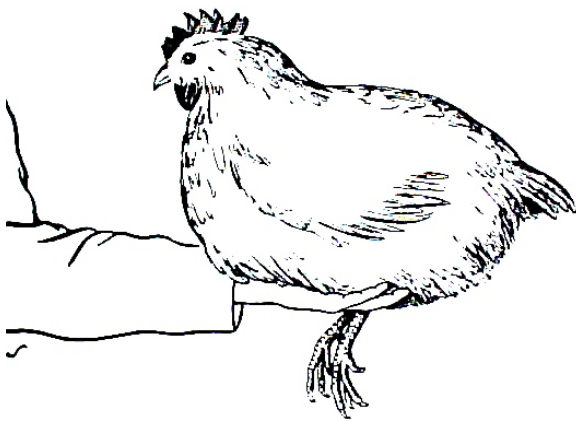
a) Carrying a Large Turkey

A Large turkey can be carried as illustrated below. Their wings are held against its body so that it is they are unable to flop its wings. Part of the weight is supported on your hip. Both legs are held firmly in one hand.

Figure: A large turkey in a comfortable carriage position

b) Holding chicken

Hold the chicken in one hand. Pass your middle finger between its legs and the other fingers slightly spread apart to support the body. You can use your other hand to work the feather for examination for parasites or scoring of body conditions.



5) Dog restraining techniques

Of all the species you'll encounter, the dog will likely display the greatest range of reactions to restraint and handling. Some dogs are calm and cooperative; others respond aggressively.

Equipment for Handling and Restraining Dogs

✓ Collars and Leashes

Any dog you handle should wear at least a collar, which allows easier control should the dog suddenly begin to resist. Several types of collars serve this purpose. Remember, whichever you choose, that any collar must be the correct size. Most dogs can easily slip out of a collar that's too large, and risk injury from a collar that's too small.



✓ Muzzles

A *muzzle* is any device applied around an animal's nose and mouth to prevent the animal from biting.

Muzzle application can also temporarily distract a dog, allowing you to complete a procedure. Several types of muzzles are available; you can also improvise a muzzle out of available materials.



✓ Head Snares

The head snare is a long metal or heavy-duty plastic tubular handle with a thick retractable wire inside it. This wire is long enough to form a large loop to be pulled out, slipped over the dog's head, and quickly tightened.



6) Restraining techniques for rabbits

A small rabbit may be lifted and carried comfortably if you hold him as shown below. You should hold it gently but firmly. This method of carrying a rabbit will prevent bruising the flesh or damage to the skin.



Carrying a heavy Rabbit

With your right hand, hold a fold of skin over the rabbit's shoulder. Tuck the head under your left arm and its body wedged between your forearm and side. Support the weight with your hip and your left hand held under the rump.

A heavy rabbit may be carried comfortably in this position without struggle or scratch. No Rabbit, large or small should ever be lifted by his ears. The ears are so large that it is tempting to use them as handles.

7) Casting cattle

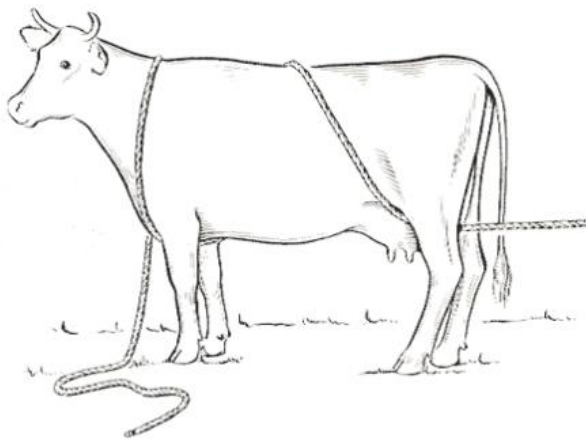
The technique of using a rope or a special harness designed for the purpose to make an animal fall to the ground or onto a specially prepared area. Used for large animals especially horses and cattle.

There are two main casting types:

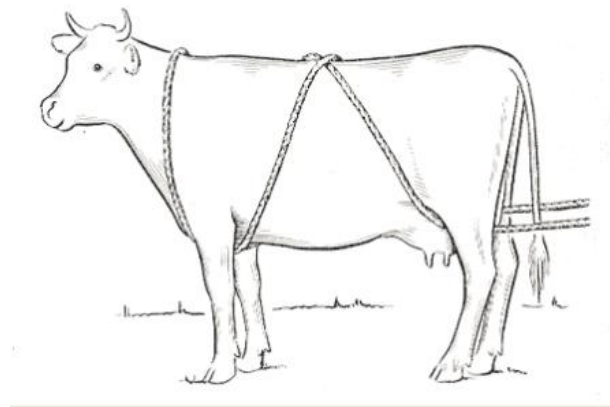
a) Burley method of casting

This method of casting cattle, devised by Dr. D. R. Burley of Georgia, has many advantages over the other casting methods.

- ✓ First, it is not necessary in this method to tie the rope around the horns or the neck. It is simply passed around the animal's body which takes less time.
- ✓ Second, this restraint does not put pressure over the thorax and thus does not interfere with the action of the heart and lungs. Third, it does not endanger the genital organs of the bull or the mammary vessels of the cow.
- ✓ Finally, with this restraint both rear legs may be tied with the ends of the casting rope.



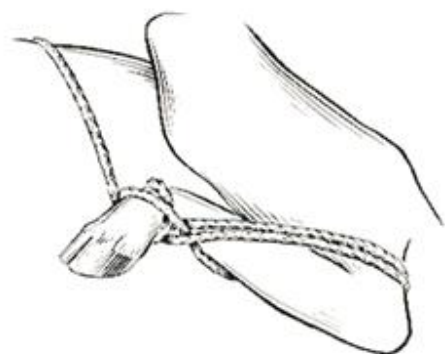
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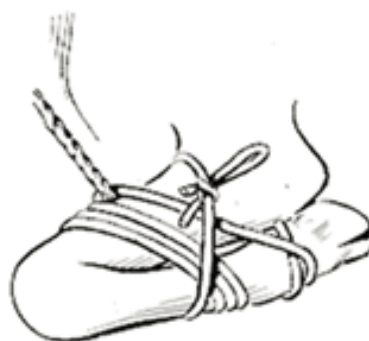
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- ✓ When the ends of the rope are pulled, the cow will fall. The operator may control the direction of the fall by pulling the casting ropes so that the animal is forced to one side or the other.

- ✓ To tie the rear leg the operator keeps both ropes taut and slides the uppermost one along the under surface of the rear leg to the fetlock. He flexes the leg and makes a half hitch around the fetlock.



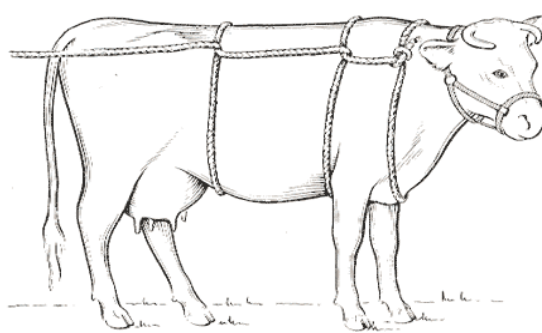
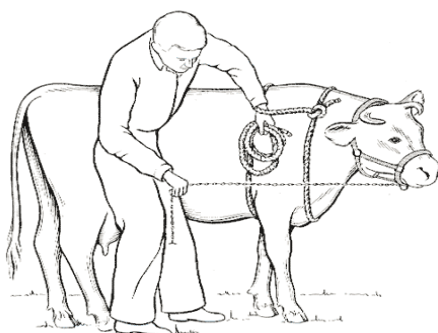
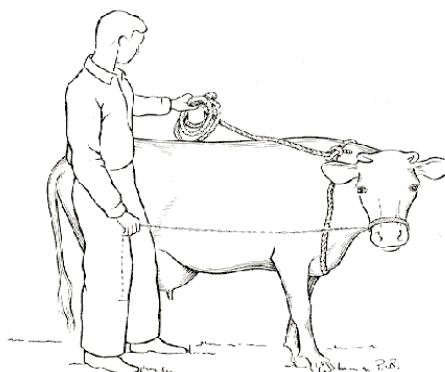
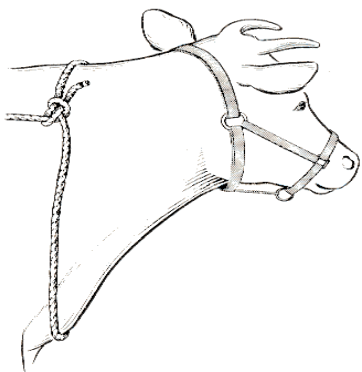
The leg

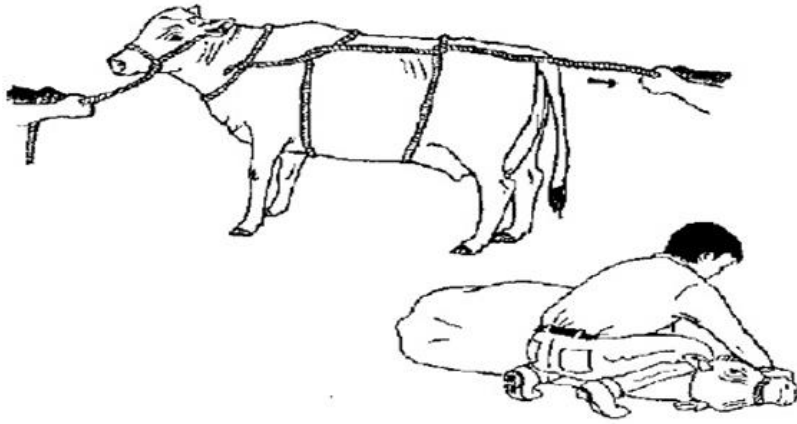


The arm

b) Rope Squeeze

This is a standard method of casting a cow. The rope for this restraint may be arranged on a cow while she is in the stanchion. She may then be led to the place where it is desired that she lie down and tension applied to the end of the rope.





- **Topic-2:Chemical restraint**

This method utilizes drugs such as sedatives, tranquilizers and anaesthesia to alter the patient's mental state, allowing the animal to stay immobilized and/or without pain, and causing the patient to be cooperative during procedures.

1) Acepromazine

Acepromazine provides a mild sedation at least 20 minutes after IV injection and 30 to 45 minutes after IM injection. The effects usually last for 2 to 4 hours. It should not be used in bulls as it can induce penis prolapsus. It also induces cardiovascular depression (myocardial depression and hypotension) and is therefore contraindicated in old, young, debilitated or hypovolemic animals.

2) Benzodiazepines

Diazepam and midazolam produce dose-dependent sedation and excellent muscle relaxation in small ruminants, with minimal cardiorespiratory depression. These effects usually last for half an hour. Those benzodiazepines are also really efficient and particularly useful in calves. In cattle, they are usually used for induction of anaesthesia, associated with ketamine.

3) Xylazine

Xylazine is commonly used to provide sedation and analgesia in ruminants as it is 10 to 20 times more potent in these species than in others. The degree of sedation induced is dose-dependent but also depends on the route of injection and the animal's temperament.

Xylazine also induces some side effects:

- ✓ Severe cardiovascular changes (bradycardia, AV blocks, decreased cardiac output)

- ✓ Respiratory effects (hypoventilation, respiratory acidosis, hypoxemia and
- ✓ Pulmonary oedema, especially in sheep)
- ✓ Decreased GIT motility and bloating
- ✓ Induction of uterine contractions
- ✓ Sweating

Learning Unit 3 – Examine livestock diseases

LO 3.1 – Conduct anamnesis

• **Topic-1: Definition of terminologies**

- ✓ **Acute:** In medicine, an acute disease is a disease with a rapid onset and/or a short course.
- ✓ **Anamnesis:** is the process of obtaining information on the animal patient about its illness, onset of illness, feeding practice etc. through careful questioning of the owner
- ✓ **Antibody:** also known as an **immunoglobulin (Ig)**, is a large, Y-shaped protein produced mainly by plasma cells that is used by the immune system to neutralize pathogens such as pathogenic bacteria and viruses
- ✓ **Antigen :** is any substance that causes your immune system to produce antibodies against it. This means your immune system does not recognize the substance, and is trying to fight it off
- ✓ **Carrier :** is an individual who carries and is capable of passing on a genetic mutation associated with a **disease** and may or may not display **disease** symptoms
- ✓ **Chronic:** Chronic Disease is a long-lasting condition that can be controlled but not cured.
- ✓ **Clinical signs:** By definition a sign is a *clinical* finding as opposed to a symptoms which is what the patient report
- ✓ **Contagious:** capable of being transmitted by bodily contact with an infected animal/person or object
- ✓ **Cosmopolite:** Growing or occurring in many parts of the world; widely distributed
- ✓ **Diagnosis:** the determination of the nature of a case of a disease or the distinguishing of one disease from another.
- ✓ **Diseases:** is a particular abnormal condition that negatively affects the structure or function of all or part of an organism, and that is not due to any immediate external injury
- ✓ **Enzootic:** An enzootic disease is constantly present in an animal population, but usually only affects a small number of animals at any one time.
- ✓ **Epidemiology:** is the study of how often diseases occur in different groups of animal
- ✓ **Epizootic:** a disease or condition that occurs at about the same time in many individuals of the same species in a geographic area.

- ✓ **Eradication** : is the reduction of an infectious disease's prevalence in the global host population to zero
- ✓ **Etiology**: Cause, also known as etiology and aetiology, is the reason or origination of something
- ✓ **Host** : **Host** refers to the animal which can get the **disease**
- ✓ **Hyperacute**: very acute or extremely acute
- ✓ **Incubation period**: is the number of days between when you're infected with something and when you might see symptoms
- ✓ **Infection**: invasion and multiplication of microorganisms in body tissues, especially that causing local cellular injury due to competitive metabolism, toxins, intracellular replication, or antigen-antibody response.
- ✓ **Infections** occur when one or more microorganisms such as bacteria or viruses enter the animal's body. Some bacteria or viruses can harm the animal, for example, by creating toxins or destroying tissue.
- ✓ **Infestation**: Parasitization of a host; usually refers to worms, arthropods.
- ✓ **Intoxication**: The pathological state produced by a drug, serum, alcohol, or any toxic substance; poisoning
- ✓ **Isolation** : separates sick animal with a contagious *disease* from those which are not sick
- ✓ **Lesion**: A lesion is any abnormality in the tissue of an organism (in layman's terms, "damage"), usually caused by disease or trauma. Lesion is derived from the Latin word *laesio* meaning injury.
- ✓ **Life cycle** : in biology, the series of changes that the members of a species undergo as they pass from the beginning of a given developmental stage to the inception of that same developmental stage in a subsequent generation.
- ✓ **Morbidity**: the condition of suffering from a disease or medical condition.
- ✓ **Mortality** : the state of being subject to death
- ✓ **Panzootic**: occurring among animals over a wide geographical area.
- ✓ **Pathogen**: may also be referred to as an infectious agent, or simply a germ. It is any organism that can produce disease
- ✓ **Pathogenesis**: is the biological mechanism that leads to a diseased state
- ✓ **Pathogenicity** : refers to the ability of an organism to cause disease (ie, harm the host)
- ✓ **Pathology**: is the study of the causes and effects of disease or injury.
Branch of medical science that involves the study and diagnosis of disease through the examination of surgically removed organs, tissues (biopsy samples), bodily fluids, and in some cases the whole body (autopsy).
- ✓ **Prevention** : the action of stopping something from happening or arising

- ✓ **Prognostic:** Information pertaining to signs and symptoms that may indicate the outcome of an illness or injury.
- ✓ **Prophylaxis:** A prophylaxis is a measure taken to maintain health and prevent the spread of disease.
- ✓ **Quarantine:** is a restriction on the movement of animals and goods which is intended to prevent the spread of disease or pests
- ✓ **Sign:** Any objective evidence of disease, as opposed to a symptom, which is, by nature, subjective. For example, gross blood in the stool is a sign of disease.
- ✓ **Symptom:** a physical or mental feature which is regarded as indicating a condition of disease, particularly such a feature that is apparent to the patient.
- ✓ **Toxicity:** is the degree to which a chemical substance can damage an organism.
- ✓ **Toxico-infection:** Toxico infection refers to the establishment of infection by the toxins produced by vegetative organisms especially *Clostridium spp.*, *Staphylococcus* etc. in the intestines and wounds.
- ✓ **Treatment:** Administration or application of remedies to a patient or for a disease or an injury; medicinal or surgical management; therapy.
- ✓ **Vectors** are organisms that transmit pathogens and parasites from one infected person (or animal) to another, causing serious diseases in human populations.
- ✓ **Zoonotic:** zoonotic disease: Any disease that is spread from animals to people

- **Topic-2: Common signs and lesions of livestock diseases**

- ✓ Allergy
- ✓ Anemia
- ✓ Anorexia
- ✓ Atrophy
- ✓ Blister
- ✓ Bloat
- ✓ Bradycardia
- ✓ Congestion
- ✓ Constipation
- ✓ Convulsion
- ✓ Dehydration
- ✓ Diarrhea
- ✓ Dyspnea
- ✓ Ecchymosis
- ✓ Emaciation
- ✓ Emphysema
- ✓ Erosion

- ✓ Fever
- ✓ Hematuria
- ✓ Hemoglobunuria
- ✓ Hyperexcitabilty
- ✓ Hypertrophy
- ✓ Icterus
- ✓ Inflammation
- ✓ Inrumination
- ✓ Lameness
- ✓ Melena
- ✓ Nodule
- ✓ Oedema
- ✓ Paralysis
- ✓ Paresis
- ✓ Petechial
- ✓ Pneumonia
- ✓ Polypnea
- ✓ Tachycardia
- ✓ Ulcer
- ✓ Vomiting
- **Topic-3: Anamnesis process**

Identification of animal owner

The farmer's full identification should be provided for the following reasons:

- ✓ To make a follow up of the animal after the first treatment
- ✓ If the animal has been stolen, it will help to get it back to the owner
- ✓ In case of any outbreak after the treatment, this information will help the District Veterinary Officer or other person who has in charge of animal health to trace the situation of that disease.

The farmer identification should contain the main information as follows:

- ✓ Farmer's name
- ✓ Address: Village/ Cell/ Sector and District
- ✚ Phone number if he/she has any.
- ✚ Age/ Sex

Animal signalment

Signalment: Assists with proper identification of the patient, diagnosis, and predilections to traits and conditions as some conditions may be species, breed, gender, age, and color specific. *Note:* Most signalment information

does not change over time. Exceptions to this include acquired markings, age, reproductive status, and means of identification.

a) Objectives

- To collect, classify, and record required patient information.
- To identify the relevance and interrelationship of the information as it relates to:
 - Diagnosis
 - Treatment
 - Nursing care
 - Patient progress

b) What to Include

- ✓ **Date and time of admittance:** Establishes a starting point for intervention and monitoring
- ✓ **Patient identification:** Name, number, electronic ID
- ✓ **Species**
- ✓ **Breed**
- ✓ **Gender and reproductive status**
- ✓ **Age:** In years, months, weeks, or days depending on age of patient
- ✓ **Colour:** In order of predominance

Animal and/or herd history

History taking or anamnesis is the process of obtaining information on the animal patient about its illness, onset of illness, feeding practice etc. through careful questioning of the owner.

History taking is important for the following reasons:

- ✓ To get complete information about the illness of the animal patient, as the animal patient cannot talk as in the case of human patient.
- ✓ Owner is the first person to notice the illness and he will have noted the clinical symptoms, which will give us some important clues for the diagnosis.
- ✓ To rule out the diseases those are species specific and age specific. For example FMD in bovine not in horses, milk fever in lactating cows not in calf.

History taking may be achieved under three headings via:

- ✓ **Immediate history (present history):** It comprises of recording the sequential events from the start of the illness.
- ✓ **Past Histories:** Inquiring into the past history may help in arriving at a diagnosis.
 - Ask if such condition was reported previously too.
 - Does this occur at certain period of time?
 - Was the disease reported from other places in the locality?
 - Has any animal recovered from such a sickness? (to aid in prognosis)
 - Is the disease restricted to certain age group / sex?
- ✓ **Nutritional history:** The state of nutrition may have some bearing on the health of animals and enquiries on nutrition may prove helpful in diagnosing a disease.

LO 3.2 – Conduct general examination of the patient

- **Topic-1: Process of physical examination of an animal**

The physical examination is the most important practical skill for a clinician to develop. It can also be one of the most challenging. A good physical examination can detect minor abnormalities before they become serious problems as well as identify major organ dysfunction without extensive and expensive medical tests.

Characteristics of healthy animals

The healthy animal is interested in food. It will graze as normal, or in the case of penned animals, look forward to the next feed. The healthy animal will drink its normal amount of water (this is easily checked with penned animals), but more difficult with animals out grazing).

1) Posture

The healthy animal appears bright and alert. It will show its normal response to humans (ie. probably moving away as you approach if it is a grazing animal or approaching if it is very used to human company).

2) Coat

The healthy animal's coat and skin will be supple and in good condition. Hair is one of the first parts of the body to register ill health, and it will also look dull if the animal is lacking some essential vitamins or minerals).

3) Mucus

The colour of the mucous membrane is a good indicator of health, as it shows the condition of the blood. Mucous membrane is found around the eye, on the gums, inside the mouth, and at the entrance to the anus. In healthy animals, it should show a salmon pink colouring (but not vivid red).

4) Vital signs (Respiration, Pulse and heartbeats)

To take the pulse:

- ✓ Locate an artery and apply gentle pressure against it with your fingers.
- ✓ Count the number of pulses for one full minute.
- ✓ Judge the rhythm and quality by varying the pressure applied to the artery for another full minute.

Normal vital signs are as outlined below:

Species	Temperature		Heart Rate (Beats/Minute)		Respiratory Rate (Breaths/Minute)
	°F $\pm$ 1°F	°C $\pm$ 0.5°C	Average	Range	
Beef Cow	101	38.3		60-70	30
Dairy Cow	101.5	38.6		60-70	30
Goat	102.3	39.1	90	70-135	12-20
Horse	100	37.8	44	23-70	12
Pig	102.5	39.2		55-86	8-18
Sheep	102.3	39.1	75	60-120	19
Rabbit	103.1	39.5	205	123-304	39
Dog	102	38.9		100-130	22
Cat	101.5	38.6	120	110-140	26

Note:

- 1) It is important to recognize that the temperatures are in a range around the number in the table. Body temperatures vary along the course of the day, and are altered with external temperatures, activity level and excitement.

These variables are not fixed, depending on the sources of information; you shall have different values for the same parameters.

Physical Examination Procedure

- 1) Signalment / History taking
- 2) General Appearance / Initial Observations
- 3) Vital Signs
- 4) Physical Exam (Systems Approach or Head to Toe)

Environmental examination

- ✓ Bedding area
- ✓ Building design
- ✓ Feeding system
- ✓ Stocking density
- ✓ Types of forage in the farm
- ✓ Waste disposal

• Topic-2: Observation of the animal at distance

- ✓ Gait
- ✓ Posture
- ✓ Behavior
- ✓ Body condition
- ✓ Hair condition
- ✓ Mucus discharges
- ✓ Feed intake

• Topic-3: Close examination

Perform systematic examination:

- ✓ Integumentary
- ✓ Digestive
- ✓ Respiratory
- ✓ Circulatory
- ✓ Urogenital
- ✓ Nervous
- ✓ Musculoskeletal

LO 3.3 – Make decision

- **Topic-1:Types of prognosis**

After physical and clinical examination, different decisions should be taken. The followings are the possible decisions that can be taken:

1) Preventive treatment

“Prevention is better than treatment”. Preventive treatment is performed when we realize that in a herd or on individual animal case, the disease is not yet clinically expressed. We can use vaccination or other ways of prevention.

2) Delay of the preventive treatment

In some situations like when the disease is clinically expressed, it is better to treat before you apply the preventive treatment. In that case the preventive treatment is delayed.

3) Clinical/Laboratory examination

When the case is not clearly defined, clinical and laboratory examination/ confirmation is undertaken to make sure of the probable disease you are suspecting.

4) Curative treatment

When the disease is diagnosed and confirmed, it follows the curative treatment which aims to eliminate completely the disease from the animal or the herd. This is possible only when the disease is curable and the appropriate drugs are available.

- **Topic-2:Register the case**

When the disease is noticed, it is always recommended to register the case for the following reasons:

- ✓ It is mainly a management tool that ensures immediate notification of alert messages as well as detailed information about outbreaks of these animal diseases in the country.
- ✓ This permits immediate access to information about contagious animal disease outbreaks and ensures implementation of early warning which enables for a prompt response for controlling the epidemiological situation.
- ✓ Helps to accumulate data on disease and have the background for other veterinarians who will come for other interventions for the same animals (patient).

Learning Unit 4 Use Antiparasitic Drugs For Prevention

L.O4.1: Select insecticides and acaricides

- **Topic-1: Acarians of veterinary interest**

Acarology (Acarians, Class of Arachnida) is a biological area which covers **mites** and **ticks**. The main difference between insects and acarians is that acarians have eight legs (four pairs of legs) while insects have six (three pairs of legs). **Arachnids**, on the other hand, have only two: the cephalothorax (the head and thorax fused together) and the abdomen.

Ticks of Veterinary importance

Ticks are a relatively small group of large (2-30 mm in length), obligatory haematophagous mites that are of paramount importance as vectors of disease among domestic animals and are second only to mosquitoes as vectors of human disease.

Classification of ticks

Within the Parasitiformes, ticks belong to the suborder Ixodida, which contains a single superfamily, the Ixodoidea, that comprises two major families, Argasidae and Ixodidae, and the rare family Nuttalliellidae, with a single African species.

➤ Ixodidae

These have a hard covering which may have a uniform colour or may have many colours which are also called **hard ticks** or **Ixodid ticks**.

Examples of hard ticks



Boophilus sp.



Amblyomma sp.



Hyalomma sp.



Rhipicephalus sp.



Ixodes sp.

➤ Argasidae

In the Argasidae, the leathery dorsal surface lacks a hard plate (scutum). Male and female argasids appear to be much alike, except for the larger size of the female and differences in external genitalia.

The important argasid ticks include *Argas spp.*, *Carios spp.*, *Ornithodoros spp.*, and *Otobius spp.*



Ornithodoros spp. *Otobius spp.*

Vector Potential

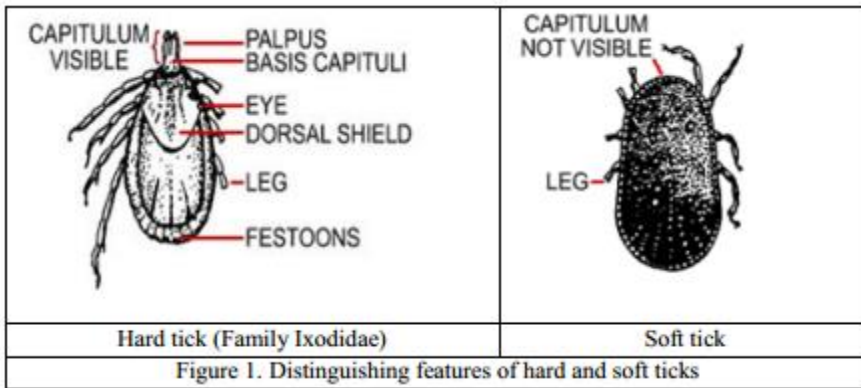
Several characteristics of ticks make them outstanding vectors of pathogenic agents. Their wide host range and tendency to feed on several hosts during their life cycle ensures ample opportunity to acquire and transmit pathogens.

Importance of ticks and tick-borne diseases (TBD)

In sub-Saharan Africa, the ticks of importance are *Rhipicephalus appendiculatus* transmitting East Coast fever (ECF), *Amblyomma* species transmitting cowdriosis and *Boophilus microplus* and *B. decoloratus* transmitting babesiosis and anaplasmosis.

Table 1 Site of tick attachments on animals

Tick species	Common sites of attachment
<i>Haemaphysalis</i>	Ear, limbs, dewlaps, neck, tail, axial, groin and abdomen
<i>Boophilus microplus</i>	Ear, limbs, dewlaps, abdomen and chest
<i>Boophilus decoloratus</i>	Abdomen, limbs, dewlap and groin
<i>Amblyomma variegatum</i>	Under the tail, margin of the anus, limbs and groin
<i>Rhipicephalus evertsi</i>	Neck, under the tail and around the anus
<i>Hyaloma a. anatolicum</i>	Chest, abdomen, neck, udder and scrotum



+ + + + **Mange agents in animal diseases**

In many animal species, and man included, mange is one of the commonest diseases once hygienic conditions become defective. The causative agents and clinical manifestation vary among animal species. The following are the main types of mange and the main hosts.

➤ **Mange in Cattle**

❖ **Sarcoptic Mange (Scabies)**

This very contagious disease is spread by direct contact or indirectly by fomites. The causative mite, *Sarcoptes scabiei var bovis*, can be transmitted to humans and is a reportable disease. Lesions start on the head, neck, and shoulders and can spread to other parts of the body; pruritus is intense.



❖ **Psoroptic Mange**

This reportable disease, caused by *Psoroptes*, does not spread to humans. Intense pruritus usually begins on the shoulders and rump; papules, crusts, excoriation, and lichenification are seen. Lesions may cover almost the entire body; secondary bacterial infections are common in severe cases. Death in untreated calves, weight loss, decreased milk production, and increased susceptibility to other diseases can occur.

❖ Chorioptic Mange (Leg Mange)

This reportable disease, caused by *Chorioptes*, does not affect humans. The pastern areas of the legs are preferred sites for the mites. A high proportion of cattle can be infested without showing clinical signs. Lesions start as papules, crusts, and ulcerations on the legs and can spread to the udder, scrotum, tail, and perineal area.



❖ Demodectic Mange

Demodex transferred from cow to calf while nursing and may cause considerable damage to hides. Pruritus is absent. Lesions consist of follicular papules and nodules, especially over the withers, neck, back, and flanks. Ulceration, abscesses, and fistulae can develop due to follicular rupture or secondary infection. Diagnosis is made by deep skin scrapings.



❖ Psorergatic Mange (Itch Mite)

It is caused by *Psorergates*. Affected animals show mild, patchy alopecia and pruritus. The disease does not cause significant economic losses; thus, animals are usually not treated. Several dips and injectable ivermectin and milbemycin are effective in controlling this infestation.

➤ Mange in Pigs

Sarcoptic mange (*Sarcoptes scabiei var suis*) is the only form of any importance in pigs. Mange mites are typically introduced to a herd after the purchase of infested breeding stock, and spread after direct contact is rapid.



➤ **Mange in dogs/cats**

a) Sarcoptic Mange (Canine Scabies)

Sarcoptes scabiei var canis infestation is a highly contagious disease of dogs found worldwide. The mites are fairly host-specific, but animals (including humans) that come in contact with infested dogs can also be affected. Typically, lesions start on the ventral abdomen, chest, ears, elbows, and hocks and, if untreated, become generalized.



b) Notoedric Mange (Feline Scabies)

This rare, highly contagious disease of cats and kittens is caused by *Notoedres cati*, which can opportunistically infest other animals, including humans. The mite and its life cycle are similar to the sarcoptic mite. Pruritus is severe. Crusts and alopecia are seen, particularly on the ears, head, and neck, and can become generalized.

c) Otodectic Mange

Otodectes cynotis mites are a common cause of otitis externa especially in cats but also in dogs. Clinical signs include head shaking, continual ear scratching, and ear droop. Pruritus is variable.

d) Canine Demodicosis

This skin disease of dogs occurs when large numbers of *Demodex canis* mites inhabit hair follicles and sebaceous glands. Two clinical forms (localized and generalized) of the disease exist. Localized demodicosis occurs in dogs <2 years old, and most of these cases, especially the nummular forms, are thought to resolve spontaneously. Lesions consist of areas of focal alopecia, erythema and/or hyperpigmentation, and comedones. Pruritus is usually absent or weak.

- **Topic-2: Main Insects of Veterinary Importance**

There are plenty of insects on earth but few of them have a significant importance in veterinary medicine. This part will just focus on those which have a significant veterinary interest.

1. Flies

There exist many flies in the environment and most of them with Veterinary importance. In this manual, the main focus is put on tsetse fly because of its direct and indirect impact on animal production.

Tsetse flies

The tsetse flies, *Glossina* spp., are important blood-feeding flies found in Africa. Tsetse flies are narrow bodied, yellow to dark brown, and 6–13.5 mm long. When resting, their wings are held over the back in a scissor-like configuration. The thorax has a dull greenish colour with inconspicuous spots or stripes. The abdomen is light to dark brown.

Other species of *Glossina* are *Glossina fuscipes*, *G. morsitans*, *G. pallidipes*, *G. brevipalpis*.

Recapitulation of the main characteristic features of tsetse fly

Proboscis Tsetse has a distinct *proboscis*, a long thin structure attached to the bottom of the head and pointing forward.



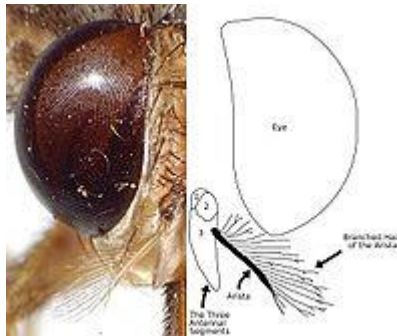
Folded wings When at rest, tsetse *fold* their wings completely one on top of the other.



Hatchet cell The discal medial ("middle") cell of the wing has a characteristic *hatchet* shape resembling a meat cleaver or a hatchet.



Branched arista hairs The antennae have arista with hairs which are themselves *branched*.



2. Fleas

Fleas are small parasites that bite pets and humans. Flea bites cause the skin to become inflamed, which is itchy. Fleas can also transmit tapeworms to cats and dogs. This happens when the animal swallows fleas when grooming.

The cat flea, *Ctenocephalides felis* (Bouche), is the most common flea infesting dogs, cats, and opossums.



3. Bugs

Bed bugs are small non-flying insects belonging to the Hemipterans that feed on blood of all kinds of mammals, particularly on humans, but also on poultry and other birds and on many mammals, including cattle, sheep, goats, swine, dogs and cats.



4. Lice (Louses)

Numerous species of chewing or biting lice (order *Mallophaga*) and sucking lice (order *Anoplura*) are obligate ectoparasites of domestic animals.

- ✓ Biting lice are: *Bovicola spp.* on a cattle and *Trichodectes sp.* on dogs
- ✓ Sucking lice as example: *Haemtopinus sp.* and *Linognatus sp.* on horses.
- ✓ *Haematopinus quadripertusus*, the cattle tail louse, is a tropical, sucking louse that has extended its distribution into subtropical areas.



Short-nosed cattle louse, *Haematopinus eurysternus*, skin *Linognathus vituli*, female

- ✓ Extreme infestation with sucking lice can cause anaemia.
- ✓ In dogs, the coat becomes rough and dry and, if lice are numerous, the hair may be matted. Sucking lice cause small wounds that may become infected.
- ✓ The constant crawling and piercing or biting of the skin causes nervousness in hosts.

• **Topic-3: Types of insecticides and acaricides**

Insecticides are any substance or a mixture of substances intended to prevent, destroy, repel, or mitigate insects. Similarly, acaricides are substances that can destroy mites. A chemical can exert both insecticidal and acaricidal effects. There are following types:

- ✓ Organophosphates and carbamates
- ✓ Pyrethrins and pyrethroids
- ✓ Amidines (Amitraz, Bimarit)
- ✓ Formamidines (Triatix)
- ✓ Fipronil

L.O4.2: Select anthelmintics and anti-protozoan

• **Topic-1: Main worms and protozoans of Veterinary Importance**

A worm: Any of a number of creeping or burrowing invertebrate animals with long, slender soft bodies and no limbs, while **Protozoa** are a diverse group of mostly mobile unicellular eukaryotic organisms.

Importance of endoparasites

Endoparasites are those parasites that live within the body of the host. There are four major groups of endoparasites— nematodes, acanthocephalans, plathelminths (trematodes and cestodes), and protozoans.

Infection with worms is common to occur. Contamination with a few parasites is unavoidable, not to worry about and can even be useful in building up resistance to those parasites. However, too many parasites weaken a goat. The goat is more susceptible to diseases and can even die. Some parasites also transmit diseases. Production and growth decline even while no symptoms of disease show.

Helminthiasis and protozoal infections

Helminthiasis, disease caused by a helminthic infection which may take any one of a number of forms while

Protozoan infections are parasitic diseases organisms formerly classified in the Kingdom Protozoa.

Description of principal endoparasites

Helminthes (worms)

Helminthes are large, multicellular organisms, generally can be seen with naked eyes in their mature stages. They are worm-like organisms living in and feeding on living hosts, receiving nourishment and protection while disrupting their hosts' nutrient absorption, causing weakness and disease. Those that live inside the digestive tract are called intestinal parasites.

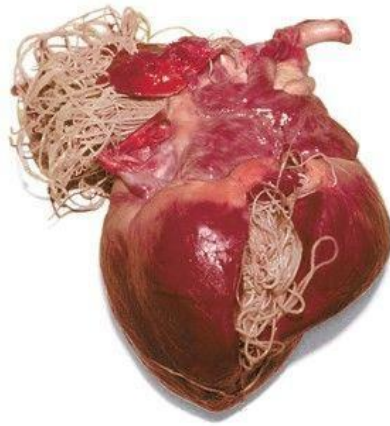
❖ **Nematodes**

a) Appearance and Morphology

- ✓ Variable length, 1 mm to several meters.
- ✓ Body covered with cuticle, may form specialized structures (e.g., alae).
- ✓ Usually sexually dimorphic with males smaller than females.



Ascaris spp.



***Dirofilaria immitis* in the heart**

b) Some diseases caused by nematodes in livestock

- ✓ Ascariasis caused by *Ascaris spp.*
- ✓ Strongyloidosis caused by *Strongyloides spp.*
- ✓ Dirofilariosis caused by *Dirofilaria spp.*

❖ Cestodes

a) Appearance and Morphology

- ✓ Body divided into scolex, neck, strobila.
- ✓ Scolex may contain holdfast organs in the form of suckers or slits and/or rostellum armed with hooks.
- ✓ Neck is the germinal region from which the strobila arises.

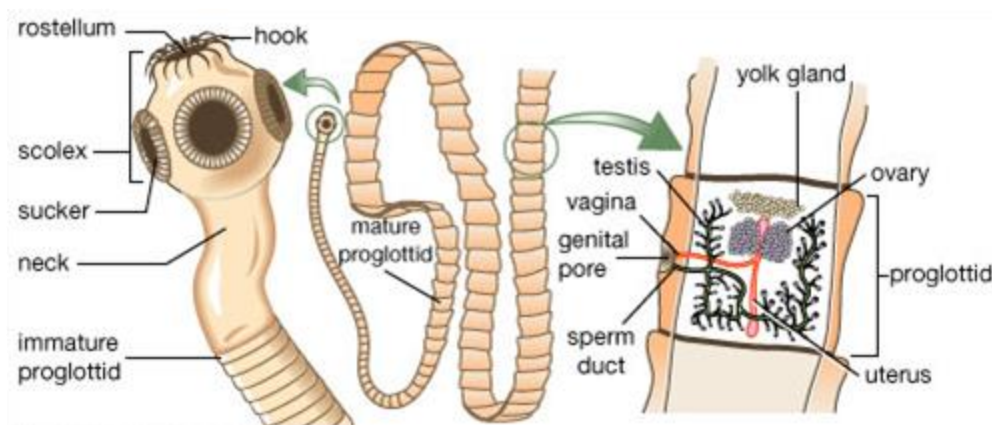


Figure: *Taeniasolium*

b) Some diseases caused by Cestodes

- ✓ Coenurosis caused by *Coenurus cerebralis*
- ✓ Cysticercosis caused by *Taenia solium*
- ✓ Echinococcosis caused by *Echinococcus granulosus* and *E. multilocularis*

❖ **Trematodes**

There are two types of trematodes—digenes and monogenes. Monogenetic trematodes have direct life cycles and are primarily ectoparasites of aquatic vertebrates. Digenetic trematodes have indirect life cycles and are endoparasites of a wide variety of vertebrates.

Diseases caused by Trematodes

- ✓ Fasciolosis caused by *Fasciola spp.*
- ✓ Dicrocoeliosis caused by *Dicrocoelium spp.*

Table 3–1 Characteristics of the Major Helminth Groups

Characteristic	Phylum			
	Nemathelminthes	Acanthocephala	Platyhelminthes	
			Cestodes	Trematodes
Body shape	Round, elongate, generally tapering at both ends, not segmented	Round, elongate, anterior with spiny proboscis, appears to be segmented	Dorso-ventrally flattened, elongate, segmented	Dorso-ventrally flattened, leaf-shaped, not segmented
Coelem	Pseudocoel	Pseudocoel	Acoelomate	Acoelomate
Digestive tract	Complete (mouth, esophagus, intestine, anus)	Absent	Absent	Incomplete (mouth, esophagus, intestine)
Sexes	Dioecious (separate sexes)	Dioecious	Monoecious (hermaphroditic)	Monoecious (exceptions)

Protozoa

Protozoa are microscopic unicellular eukaryotes that have a relatively complex internal structure and carry out complex metabolic activities.

Some of Protozoa are: *Theileriasp*, *Anaplasmasp*, *Babesiasp*, *Trypanosomas*, *Coccidiasp*, *Giardia sp*, *Toxoplasma sp*

Types of Anthelmintics: Avermectins and milbemycins ,Benzimidazoles ,Pyrantel, Piperazines

Anticestodals :

Antitrematodals:

Types of anti-protozoan:Amprolium, Sulfadimethoxine,Metronidazole,Furazolidone,Buparvaquone Imidocarb, Diminazene aceturate

L.O 4.3: Use antiparasitic drugs for prevention

- **Topic-1: External antiparasitics**

Antiparasitic animal drugs are used to treat and control parasitic infections and infestations in animals.

Example: Ivermectin

Ivermectin acts by causing paralysis in susceptible arthropods and nematodes. It is used in small animals for treatment of *Sarcoptes scabiei*, *Otodectes cynotis*, and *Demodex canis*; in cattle for psoroptic mange, lice. It also acts on internal parasites.

- **Topic-2: Techniques of applying insecticides and acaricides**

The most popular method of controlling ticks on livestock is the application of acaricides directly to the animal host. It is important that application techniques be thorough and that the acaricides be highly effective against ticks without injuring the host.

Dipping vat

The usual way of treating large numbers of animals with acaricides is to immerse them in acaricides in dipping vats. The many different vats that have been designed all include three basic components: (1) an approach area, (2) a vat or tank in which animals are immersed, and (3) a drainage area.

Spray

Because of the disadvantages of the dipping vat for small operations, sprays are the most commonly used method of treating animals with acaricides for the control of ticks. However, spraying is generally less efficient in controlling ticks than immersion in a dipping vat because of problems associated with applying the acaricide thoroughly to all parts of the animal's body.

Hand dressing

In certain instances, as when a species of tick inhabits a limited area of an animal's body, acaricides may be applied to these areas by hand.

Pouring

Pour-on treatments are applied epicutaneously to livestock for the control of ectoparasites and tsetse flies and the various diseases that they transmit. The pour-on treatment is one of several live-bait techniques and one that is simply administered, as it is purchased as a ready-to-use formulation and does not require dip tanks, spray races or hand-held, pressurised spray equipment.

Other methods

- ✓ For example, oral treatments or injections of some chlorinated hydrocarbon insecticides have controlled *B. microplus* on cattle. Also, oral treatments with animal systemic insecticides have controlled several species of ticks feeding on livestock.
- ✓ Another example is the tick control achieved through the use of insecticide-impregnated plastic ear tags or horn bands. This treatment method is similar to the “dog collar technique” used to control fleas and ticks on pets.

- **Topic-2: Rationale of ectoparasites control**

The rationale for the ectoparasite control is rather simple. It is more of putting the end to the life cycle of the ectoparasites. It mainly consists of either killing the parasites before they mature and start to lay eggs or kill mature parasites capable of laying eggs. There is also a way of making the environment non conducive for eggs hatching.

- **Topic-3: Perform chemoprevention against worms and protozoans**

Both helminthiasis and protozoal diseases can be controlled using different approaches. In this section chemoprevention is discussed.

Internal antiparasitic drugs

Internal antiparasitic drugs mainly consist of anthelmintic and antiprotozoal drugs. However, some anti-ectoparasites can be administered by injections and thus, considered as medicines for internal use though; they act on both internal and external parasites. The main example is IVERMECTIN which is administered by subcutaneous route.

Anthelmintic drugs

There are three major groups of antihelminthic drugs. The grouping is based on which helminth they act on.

- **Antinematodals (Nematocides)**
 - ✓ Avermectins and milbemycins
 - ✓ Benzimidazoles (Thiabendazole, Fenbendazole, Oxibendazole, Albendazole, Oxfenbendazole)
 - ✓ Pyrantel
 - ✓ Piperazines
- **Anticestodals (Cestocides)**
 - ✓ Praziquantel
 - ✓ Epsiprantel
- **Antitreumatodals (Trematocides)**
 - ✓ Nitroxynil
 - ✓ Rafoxanide
 - ✓ Closantel
 - ✓ Triclabendazole

Deworming medications planning

In Veterinary Medicine, dewormers are normally administered on a trimester basis. However, this period might not be respected with regard to some factors like physiological status among others.

Antiprotozoals

- Amprolium
- Sulfadimethoxine
- Metronidazole
- Furazolidone
- Buparvaquone
- Imidocarb

Control of protozoal infections

Being vector borne diseases, the control of protozoal infections consist of elimination of vectors and intermediate hosts. But also, there are vaccines for some protozoal diseases.

Prophylactic plan

The prophylactic plan is determined by many factors such as animal species, diseases to prevent, geographical area amongst others. Example of prophylactic plans in different animal species is given on the appendix of this document.

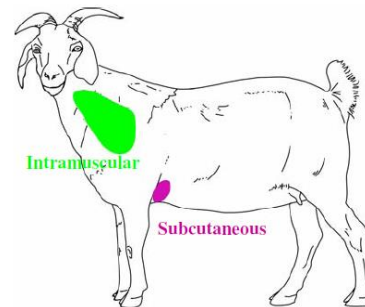
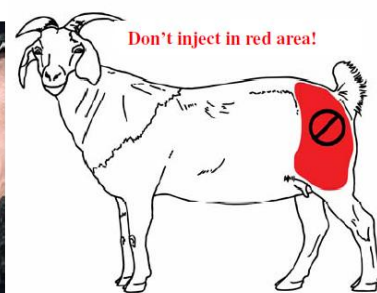
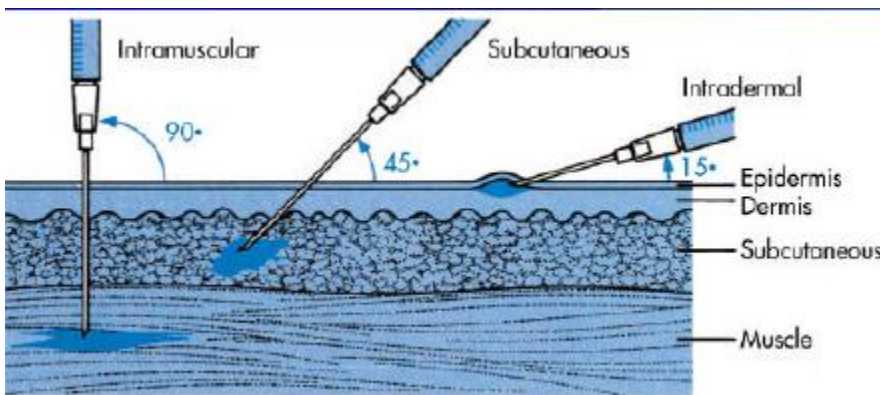
- **Topic-4: Administration routes for chemoprevention drugs**

- **Per os, drenching:** commonly used to administer some antihelmintic drugs. Drugs administered through this route are the ones with fewer complications as far as administration is concerned. Therefore, farmers can easily administer drugs via this route with no assistance of a trained veterinary or para-veterinary officer.
- **Injection:** some drugs such as ivermectin, etc. are administered by injections. The types of injections in this case will vary according to the drug and the animal species.

Common Injections in Domestic Animals

1. Subcutaneous injections

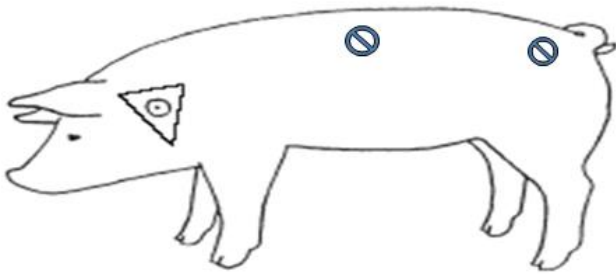
Subcutaneous injections are given under the skin using a short needle, 1 - 2.5 cm long.



2. Intramuscular

Intramuscular injections are the most common injection method and require the needle to be inserted into a muscle. Intramuscular injections are commonly given in the triangular area of the neck, in front of the shoulder. Do not give intramuscular injections in the loin or hind leg of sheep and goats that are used for meat to prevent

injection site blemishes that lower the value of the meat. Never give an injection near the spine to prevent accidentally causing nerve damage.



3. Intravenous

An intravenous injection requires skill to locate a vein, usually the jugular vein in the neck, insert the needle, and ensure that the needle remains in the vessel while the drug is given. These injections should always be given by a veterinarian or experienced animal health technician. Animals may react quickly to drugs given in this fashion due to rapid absorption. Very few drugs need to be given intravenously; however, blood samples often need to be collected and the technique is the same. Intravenous injections are usually done using an 18 or 20 gauge hypodermic needle.



Learning Unity 5: Vaccinate animals and apply sanitary prophylaxis

L.O5.1: Identify common notifiable diseases

- **Topic-1: General medicine concepts and definitions**

- ✓ Acute
- ✓ Bacteria
- ✓ Chronical
- ✓ Contagious
- ✓ Cosmopolite
- ✓ Enzootic
- ✓ Epizootic
- ✓ Hyper Acute
- ✓ Microbes
- ✓ Notifiable Diseases
- ✓ Panzootic
- ✓ Prophylaxis
- ✓ Sporadic
- ✓ Viruses
- ✓ Zoonotic Diseases

- **Topic-2: Brief description of common notifiable diseases (listing)**

1. Anthrax
2. Black quarter
3. Lumpy skin disease
4. Foot and mouth disease
5. Pleuropneumonia
6. Brucellosis
7. Rabies
8. Canine distemper
9. etc

- **Topic-3: Brief description of avian common infectious diseases (listing)**

A notifiable disease is any disease that is required by law to be reported to government authorities. The collation of information allows the authorities to monitor the disease, and provides early warning of

possible outbreaks. In the case of livestock diseases, there may also be the legal requirement to destroy the infected livestock upon notification. Many governments have enacted regulations for reporting of both human and animal (generally livestock) diseases. This usually happens during pandemics.

Eg:

1. New castle disease
2. Gumboro disease
3. Infectious bronchitis
4. Chicken pox
5. Marek disease
6. Avian influenza

Learning Outcome 5.2: Administrate Vaccines

- **Topic-1:Types of vaccines and use**

A vaccine is a biological preparation that improves immunity to a particular disease. A vaccine typically contains an agent that resembles a disease-causing microorganism and is often made from weakened or killed forms of the microbe, its toxins or one of its surface proteins. The agent stimulates the body's immune system to recognize the agent as foreign, destroy it, and keep a record of it, so that the immune system can more easily recognize and destroy any of these microorganisms that it later encounters.

1.Live attenuated vaccines

Some vaccines contain live, attenuated microorganisms. Many of these are active viruses that have been cultivated under conditions that disable their virulent properties, or that use closely related but less dangerous organisms to produce a broad immune response.

2.Killed vaccines

Inactivated or killed vaccines are made from microorganisms (viruses, bacteria, other) that have been killed through physical or chemical processes. These killed organisms cannot cause disease.

Vaccines preparation and preservation period after preparation

1. **Vaccine preparation:** This consists mainly of dilution of some types of vaccines. Some vaccines have a liquid form but others have are powders which need to be diluted using specific diluent. Others, despite being liquid, they are also diluted with water before administration. This is the case for most poultry vaccines.
2. **Transport, store and handle vaccines according to the manufacturer's recommendations.**

It is important not to break the 'cold chain', a phrase used to describe the manner in which a vaccine should be transported and stored– at an optimum temperature that avoids temperature extremes.

Vaccination methods

Injection, Per os ,Scarification, Spraying , Pouring

Use needles of appropriate size, based on the age of the animal, weight of the animal, the route of product administration, and the viscosity of the product.

- ✓ **IM** (intramuscular) – 18 or 16 g, 1 to 1 ½"
- ✓ **SC** (subcutaneous) – 18 or 16 g, ½ to 1"
- ✓ **Oral**: Into the mouth
- ✓ **Mucosal**: The administration of a vaccine to a mucosal surface such as the digestive tract, the respiratory tract, the reproductive tract or the inner surface of the eyelid.
- ✓ **IN**: Intranasal (into the nostrils)
- ✓ **ID**: Intradermal (within the skin)
- ✓ No vaccines go IV

Appropriate vaccine administration is a critical component of a successful immunization program.

Ensure that the animal is restrained securely before injection. Use only sharp and straight needles (discard dull, bent or burred needles).



Cattle vaccination techniques

Adverse Reactions

- ✓ Animals should be observed after vaccination for evidence of adverse reactions.
- ✓ Life-threatening anaphylactic responses can occur.
- ✓ Cattle should be observed for at least one hour post-vaccination.

- ✓ Itching, swelling and redness of the skin may indicate signs of a local adverse response.
- ✓ Adverse responses may not be limited to the injection area and may be visible around the nose, anus and vulva.

Vaccines storage and transport

- ✓ If a group of animals is to be processed, or if several vaccines are to be delivered, keep vaccines in a cool, insulated container and remove them only as needed.
- ✓ Once opened, a bottle of modified live vaccine should be used within an hour and a bottle of killed vaccine should be used within 6 to 8 hours.
- ✓ Killed vaccines need to be used the same day that the vaccine bottle is opened.
- ✓ Most modified live vaccines must be re-hydrated by adding a sterile diluent to a vacuum-packed, freeze-dried material.
- ✓ After re-hydration, modified live vaccines are only effective for an hour under perfect conditions.

- **Topic-2: Vaccination planning**

Vaccine usage needs to be planned relative to the predicted time of disease challenge, and vaccine limitations including the time following vaccination when a protective immune response is present, taken into account.

- **Topic-3: Vaccination certificate**

Once the animal has had its primary course of vaccinations a vaccination certificate will be given to the animal owner showing the animal's details, the dates the vaccine was given and when a booster is due. Mostly this vaccination certificate is used in pets (dogs, cats) and other animals that have to travel from one country to another one.

Vaccination Schedule

SNO	Disease	Animal	Vaccine	Dose	Immunity	Time of vaccination
1	Foot & Mouth Diseases (FMD)	All cloven footed animals	Polyvalent FMD vaccine	3 ml. S/C	1 Year	February & December
2	Hemorrhagic Septicemia (HS)	Cattle, Buffalo	HS Vaccine	5 ml S/C	6 month & 1 Year	May-June
3	Black Quarter (BQ)	Cattle, Buffalo	BQ Vaccine	5 ml S/C	6 month & 1 Year	May-June
4	Anthrax	All species of animals	Anthrax Spore Vaccine	1 ml S/C	1 Year	May-June
5	Enterotoxemia (ET)	Sheep & Goat	ET Vaccine	5 ml S/C	1 Year	May-June
6	Contagious CaprinePleuro Pneumonia (CCPP)	Sheep & Goat	IVRI Vaccine	0.2 ml S/C	1 Year	-
7	Peste Des Pettis Ruminants (PPR)	Sheep & Goat	PPR Vaccine	1 ml S/C	3 Year	-
8	Brucella	Female cattle & buffalo Calf age 4-8 months only	Brucella Vaccine	2 ml S/C	1 Year	-
9	Theileriosis	Cattle & calves above 2 months of age	Theileria Vaccine	3 ml S/C	1 Year	-
10	Rabies	All species of animals	Rabies Post Bite Vaccine	1 ml S/C	1 Year	0, 3,7,14,28 & 90 days

Note - Before any vaccination deworming should be compulsory to get better results.

	Disease	Animal	Vaccine	Dose	Immunity	Time of vaccination
1	Foot & Mouth Diseases (FMD)	All cloven footed animals	Polyvalent FMD vaccine	3 ml. S/C	1 Year	February & December
2	Hemorrhagic Septicemia (HS)	Cattle, Buffalo	HS Vaccine	5 ml S/C	6 month & 1 Year	May-June
3	Black Quarter (BQ)	Cattle, Buffalo	BQ Vaccine	5 ml S/C	6 month & 1 Year	May-June
4	Anthrax	All species of animals	Anthrax Spore Vaccine	1 ml S/C	1 Year	May-June
5	Enterotoxemia (ET)	Sheep & Goat	ET Vaccine	5 ml S/C	1 Year	May-June
6	Contagious CaprinePleuro Pneumonia (CCPP)	Sheep & Goat	IVRI Vaccine	0.2 ml S/C	1 Year	-
7	Peste Des Pettis Ruminants (PPR)	Sheep & Goat	PPR Vaccine	1 ml S/C	3 Year	-
8	Brucella	Female cattle & buffalo Calf age 4-8 months only	Brucella Vaccine	2 ml S/C	1 Year	-
9	Theileriosis	Cattle & calves above 2 months of age	Theileria Vaccine	3 ml S/C	1 Year	-
10	Rabies	All species of Animals	Rabies Post Bite Vaccine	1 ml S/C	1 Year	0, 3,7,14,28 & 90 days

L.O5.3: Apply prophylactic measures

Sanitary prophylaxis is that which doesn't necessarily involve the administration of drugs. It rather focuses at improving the environmental conditions with the aim of stopping or cutting the life cycle of the causative agents. This type of prophylaxis rarely apply in non-infectious diseases and conditions.

- **Topic-1: Prophylactic measures**

1) Quarantine and isolation and acclimatization procedures of new stocks

- ✓ Isolate and quarantine all new in-coming stock/animals for minimum period of 2 weeks in isolation shed/cage that should be far away as possible from the resident animals.
- ✓ Observe these animals for any sign of sickness

2) Animal culling and isolation of sick and unfit stocks

For some specific disease mainly those that are not curable, the culling is the main way of preventing disease spread. Isolation, testing, vaccination, and other techniques are all important elements of a properly managed isolation program.

Good herd management requires the culling of unproductive animals from the herd and replacement with improved stock.

3) Rest period and all in/all out principle

All-in all-out management system = single age.

- ✓ Don't add new animals to a herd/ farm
- ✓ Prevent spread of diseases from age group to another on the same farm (due to different health and immunological status)
- ✓ Allow simultaneous depopulation of facilities between flocks and periodical clean-up and disinfection of all houses and equipment to reduce infectious pressure or to break the cycle of disease

4) Slaughtering of animals

In emergency disease outbreaks, large numbers of animals may need to be killed for control, containment and/or eradication purposes. Strategies for disease control will usually involve complete depopulation of herds/flocks, and may extend to depopulation across designated areas. Live animals present the major risk of spreading infectious agents so their slaughter should be completed as quickly as possible, with minimal pain and distress to the animals.

As necessary, operational procedures should be adapted to the specific circumstances operating on the premises and should address, apart from animal welfare, aesthetics of the method of euthanasia, cost of the method, operator safety, biosecurity and environmental aspects.

5) Disposal of dead animals (burning, deep burying with quick lime or disposal pit)

Within seventy-two hours after death or discovery, the owner of a dead animal or, if the owner of the animal cannot be identified, the owner of the property on which the animal is found must properly dispose of the dead animal. A dead animal must be covered or otherwise removed from public view immediately upon discovery by the person responsible for disposing of the dead animal.

6) Foot baths/vats

For better prevention of diseases in farm, the following recommendations/ precautions must be considered:

- ✓ Minimize your visits to other farms. *Remember*; never visit other farms during disease outbreak!
- ✓ Limit the entry of visitors to your farm. Permit only essential visits.
- ✓ Keep set of coverall and boots for visitors (servicemen, veterinarian, electrician, etc.).
- ✓ Disinfect footwear between sheds in a footbath.
- ✓ Remember to:
 - ❖ Refresh the solution daily!
 - ❖ use a brush to remove dirt

7) Fencing

In case of emerging and very contagious diseases, it is recommended to fence the shelter for a better management of outbreak; this serves to avoid contamination between herds and in the herd between the individual animals.

8) Cleaning and disinfection of animal shelters

- ✓ Disinfection is the process of eliminating infectious organisms by using chemical or physical agents.
- ✓ The antimicrobial agents designated as disinfectants are sometimes used alternatively as sterilizing agents, sanitizers or antiseptics.
- ✓ Cleaning is another method of eliminating microorganisms in the shelter; you can use usual detergents (soap) and disinfectants.

9) Implementation of vaccination and health programs

Vaccines are an important tool to use in herd health programs for the protection of animal health. However, vaccines do not prevent all disease by themselves, and should be used in conjunction with good

management practices. The timing of vaccination and selection of product are important considerations. It is best to use vaccines as part of a total herd health program.

EXAMPLES OF BASIC VACCINATION PROGRAM

Timing	Vaccines Used		
Timing	Example 1	Example 2	Example 3
1-3 months of Age	Blackleg / Malignant edema Enterotoxemia C & D IBR, PI3 (intranasal)	7 or 8-way Clostridial vaccine IBR, PI3 (intranasal) Dehorn, castration	7 or 8-way Clostridial Chem. Alt. MLV-IBR/PI3, K-BVD, MLV-BRSV Dehorn, castration
4 weeks later		Repeat of Clostridial vaccine BRSV, Pasteurella (if needed)	
2-6weeks pre-weaning		Repeat of Clostridial vaccine Killed IBR, PI3, BVD, BRSV	Repeat of Clostridial Chem. Alt. MLV-IBR/PI3, K-BVD, MLV-BRSV
Weaning	Blackleg / Malignant edema Enterotoxemia C & D	MLV- IBR, PI3, BVD, BRSV (Pasteurella - if booster needed)	MLV- IBR, PI3, BVD, BRSV
2-3weeks post-weaning	MLV - IBR, PI3, BVD, BRSV	MLV - IBR, PI3, BVD, BRSV	MLV- IBR, PI3, BVD, BRSV
Replacement heifers at	Brucellosis	Brucellosis	Brucellosis
1 month pre-breeding of replacement heifers	Blackleg / Malignant edema Enterotoxemia C & D MLV -IBR,PI3, BVD, BRSV	Repeat of Clostridial vaccine MLV-IBR, PI3, BVD, BRSV Lepto (5 strain)	Repeat of Clostridial vaccine MLV-IBR, PI3, BVD, BRSV Lepto (5 strain)

• Topic-2:Records and feedback report keeping

1) When a veterinary medicine is bought or otherwise acquired for a food-producing animal the keeper must, at the time, record:

- ✓ the name of the product and the batch number
- ✓ the date of acquisition
- ✓ the quantity acquired
- ✓ the name and address of the supplier

2) At the time of administration the keeper must record:

- ✓ the name of the product
- ✓ the date of administration
- ✓ the quantity administered
- ✓ the withdrawal period
- ✓ the identity of the animal(s) treated

3) If the keeper disposes of a veterinary medicine other than by treating an animal, he/she must record:

- ✓ the date of disposal
- ✓ the quantity of product involved
- ✓ how and where it was disposed of

• **Topic-3:Reporting suspicion of notifiable diseases**

Animal diseases that are of national concern are 'notifiable' animal diseases. This means that there is a legal requirement for anyone including the owner, manager, veterinarian, or livestock consultant who suspects or diagnoses a notifiable disease to immediately report it.

1) Symptoms suggestive of a notifiable, serious or unusual disease

In general terms, the following signs in livestock or birds are indicative of a notifiable, serious or unusual disease and must be reported:

- ✓ a large number of cases or dead animals
- ✓ rapid spread of disease through a herd or flock
- ✓ unusual nervous signs
- ✓ production drop – milk yield in livestock or egg production in birds (or an increase in percentage of thin-shelled eggs)
- ✓ any unusual or unfamiliar disease symptoms in animals or birds

Less dramatic signs should also be watched for, such as animals not eating properly and animals that are depressed and don't respond the way they should.

2) Information to provide when reporting a suspected notifiable, serious or unusual animal disease

Upon contacting your vet or Animal Health Adviser, you will need to provide some basic information that will assist in determining the most appropriate course of action - this should include:

- ✓ what pest or disease is suspected (if known)
- ✓ (if not you) the name of the owner and/or farm manager
- ✓ full property details including street address, telephone number,

- ✓ the livestock species (e.g. sheep, cattle etc) and the approximate numbers of animals on the property (including wild animals)
- ✓ the type of animals that are affected (e.g. cattle only or a specific age group)
- ✓ a brief description of clinical signs and any lesions observed
- ✓ the date when you first noticed the signs
- ✓ an approximate number of sick or dead animals

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