Animal Health Care Services
Level- IV

Based on March 2018, Version 3
Occupational Standards

Module Title: Controlling trans-boundary Animal Diseases with Others in the Animal Care Industry

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LG # 50	LO # 1- Follow OHS procedure

Instruction sheet

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

- Recognizing and reporting health risks in handling and using veterinary drugs
- Following Safe work practices
- Using, maintaining and storing PPE clothing and equipment
- Implementing OHS procedures with the country's disease prevention and control strategies
- Disposing off wastes in line with environmental health policies and legislations

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

- Recognize and report health risks in handling and using veterinary drugs
- Follow safe work practices according to organizational guidelines
- Use, maintain and store PPE cloth and equipment
- Implement OHS procedures with the country's disease prevention and control strategies
- Dispose off wastes in line with environmental health policies and legislations

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the "Information Sheets". Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the "Self-checks" which are placed following information sheets.

5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to the next information sheet
7. If your performance is unsatisfactory, see your trainer for further instructions

Information sheet 1- Recognizing and reporting health risks in handling and using of veterinary drugs

1. Introduction

Veterinary drug" means any substance or mixture of substances which is used, or is manufactured, sold or represented as suitable for use, in the diagnosis, treatment, mitigation or prevention of disease or abnormal physical or mental state or the symptoms thereof in an animal; or restoring, correcting or modifying any physical, mental or organic function in an animal. Residues (metabolites) of drug/pesticide compounds can contaminate edible tissues above permitted threshold levels. The use of veterinary drugs in livestock production is inevitable as they are essential for treatment of diseases (therapeutic), prevention of diseases (prophylaxis), modification of physiological functions (such as tranquilizers, anesthetic drugs), improvement of growth and productivity (growth promoters) as well as for ensuring food safety.

The veterinary drugs are used throughout the world and they comprise a broad variety of classes of chemical compounds including vaccines, antimicrobials, antiparasitics and β-agonists. A residue, defined in the simplest terms, results when a drug or pesticide is deliberately applied to a food-producing animal or plant. Residual amounts of antimicrobials or their toxic metabolites found in meat, organs or other products such as milk and egg of food producing animals is called veterinary drug residues. The uncontrolled use of anti-infectious agents can lead to residues in animal products, especially when users fail to respect waiting periods. The risks of residues in foodstuffs of animal origin could be reflected into several forms. The immediate effect of antimicrobial residue is allergenicity and toxicity in human through the food chain. The long-term health adverse effects such as increased likelihood include disruption of normal human flora in the intestine (microbiological effects), carcinogenicity, and teratogenicity.

1.1 Risks in veterinary drug use

Many different biological and chemical agents are discovered, developed and used in the pharmaceutical industry. Risks in the veterinary drug use may include animal bite, kick, horning, manual handling, zoonotic diseases, light (ultraviolet), radiation, sharps, odors, chemicals, biological waste, electricity, noise associated with drug use , hypersensitivity, over dosage, accidental self injection or burn by chemicals ,chemical spillage and gas leakages.

1.2 Public Health Significance of Veterinary Drug Residues

Occurrences of veterinary drug residues pose the broad range of health consequences in the consumers. The residues of antibacterial may present pharmacological, toxicological, microbiological and immune pathological health risks for humans. Some medicines used in veterinary practice have a high abuse potential. Some consumers are allergic to penicillin, having been sensitized as a result of its use in human medicine.

By eating animals and animal products (meat, milk, eggs, etc.), humans are liable to consume whatever chemicals the animal has consumed or been exposed to veterinary drugs, but also insecticides used on the animal, herbicides and fertilizers used on pastures and chemical additives used in its feed. Some of these substances are toxic (in particular, pesticides and herbicides), and some are undesirable in other ways for use on animals whose products are consumed by humans.

The major public health significances of drug residue are development of antimicrobial drug resistance, hypersensitivity reaction, carcinogenicity, mutagenicity, teratogenicity, and disruption of intestinal normal flora. Inadequate good sanitary care during animal or product transportation, including the cross contamination of animal feeding stuffs with inadvertently applied drugs, environmental and animal to animal transfer of drugs may also cause residues. Public health risk from vet drug residues are Anaphylaxis/ food allergies, Reproductive disorders e.g. birth malformation, genotoxicity, Development of Antimicrobial Resistance (AMR) through food chain and long term effects e.g. carcinogenesis.

Self-check 1- Written test

Name…… ID…… Date…….

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

Part 1: Short answer questions

1. What are the long-term health adverse effects of veterinary drug use and handling? (3 points)
2. Define veterinary drug residues (2 points)
3. Describe risks in which can be occur during veterinary drug admnistration (3 points)

Part 2: Choose the correct answers from the following alternatives (2 points each)

1. _____ means any substance or mixture of substances which is used, or is manufactured, sold or represented as suitable for use, in the diagnosis, treatment.
   a. hygiene b. food c. veterinary drug d. risks
2. Human beings are exposed to veterinary whatever chemicals the animal has consumed through_____
   a. drinking milk b. eating meat c. eating egg d. all

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

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 2- Following safe work practices

2. Introduction

Safe work practices are generally written methods outlining how to perform a task with minimum risk to people, equipment, materials, environment, and processes. Safe work practices should be developed as a result of completing a job safety analysis or a hazard risk assessment and should closely reflect the activities most common in the company's type or sector. Some safe work practices will require specific job procedures, which clearly set out in a chronological order each step in a process. Safe work practices include the use of PPE clothing and equipment relevant to the task such as safety goggles, glasses, protective masks and animal handling gauntlets. Protocols for safe work practices include risk identification and risk minimization; the handling, use, storage, transport and disposal of chemicals and of biological. The handling of chemicals and medicines in the organization requires extra care to ensure safe work practices are maintained.

2.1 Use Personal Protective Equipments

What is personal protective equipment (PPE)? PPE means personal protective equipment or equipment you use to guarantee your (own) safety. Use PPE always and anywhere where necessary. Observe the instructions for use, maintain them well and check regularly if they still offer sufficient protection. There are various types of PPE.

A. Safety for the head

Wearing a helmet offers protection and can prevent head injuries. Select a sturdy helmet that is adapted to the working conditions. These days you can find many elegant designs and you can choose extra options such as an adjustable interior harness and comfortable sweatbands.

B. Safety for the eye

The eyes are the most complex and fragile parts of our body. Each day, more than 600 people worldwide sustain eye injuries during their work. Thanks to a good pair of safety glasses, these injuries could be prevented.

C. Ear protection

Do you work in an environment with high sound levels? In that case it is very important to consider hearing protection. Earplugs are very comfortable, but earmuffs are convenient on the work floor as you can quickly put these on or take them off.

D. Respiratory protection

Wearing a mask at work is no luxury, definitely not when coming into contact with hazardous materials. Dust masks offer protection against fine dust and other dangerous particles. If the materials are truly toxic, use a full-face mask. This adheres tightly to the face, to protect the nose and mouth against harmful pollution.

E. Hand protection

Hands and fingers are often injured, so it is vital to protect them properly. Depending on the sector you work in, you can choose from gloves for different applications:

- protection against vibrations
- protection against cuts by sharp materials
- protection against cold or heat
- protection against bacteriological risks
- Protection against splashes from diluted chemicals.

2.2 Risk assessment and risk minimization

Risk assessment involves considering the possible results of someone being exposed to a hazard and the likelihood of this occurring. A risk assessment assists in determining:

- How severe a risk is
- Whether existing control measures are effective

- What action should be taken to control a risk
- How urgently action needs to be taken.

A risk assessment should include:

- Identify factors that may be contributing to the risk
- Review health and safety information that is reasonably available from an authoritative source and is relevant to the particular hazard
- Identify the actions necessary to eliminate or control the risk; and
- Identify records that it is necessary to keep to ensure that the risks are eliminated or controlled

2.3 Safe handling, use, transport and disposal of chemical and biological waste

The management of wastes arising from health care establishments is a matter of continuing concern to workers in the waste industry and the general public. These concerns are based upon the potential for spread of infection, the risk of injury, chemical toxicity and aesthetics. It is important that the medical profession, nurses, portering staff, laboratory staff and others dealing with medical wastes adopt procedures that minimise risk to the environment, public, fellow workers and people working in the waste industry.

What is medical waste? Medical waste is defined as waste consisting of: a needle, syringe with needle, surgical instrument or other article that is discarded in the course of medical, dental or veterinary practice or research and has a sharp edge or point capable of inflicting a penetrating injury on a person who comes into contact with it;

- Human tissue, bone, organ, body part or foetus.
- A vessel, bag or tube containing a liquid body substance.
- An animal carcass discarded in the course of veterinary research or medical practice or research.
- A specimen or culture discarded in the course of medical, dental or veterinary practice or research and any material that has come into contact with such a specimen or culture.

- Any other article or matter that is discarded in the course of medical, dental or veterinary practice or research and that poses a significant risk to the health of a person who comes into contact with it.

Requirements for storage of medical waste

- Contain medical waste in a manner that is not offensive and that minimises the threat to health, safety or the environment.
- Store all containers of medical waste in a secure location.
- Ensure all necessary equipment required to clean and disinfect the area in case of accidental spillage is easily available and accessible.
- Treat any waste mixed with medical waste, as medical waste.
- Sharps such as needles, syringes with needles and surgical instruments are to be handled carefully
- Place sharps into a suitable container that:
    - ✓ is puncture-resistant, leak-proof, shatter-proof and able to withstand heavy handling
    - ✓ displays the universal biohazard label and has a label clearly indicating the nature of the contents
    - ✓ has an opening which is accessible, safe to use, and designed so that it is obvious when the container is full
    - ✓ is sealed when full or ready for disposal
    - ✓ Can be handled without danger of the contents spilling or falling out.

Self check 2- Written test

Name…… ID…… Date…….

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

Part 1: Short answer questions

1. Define medical wastes (2 points)
2. Discuss importance of safe waste disposal in veterinary services (1 point)
3. What is the difference between biological and chemical wastes (2 points)

Part 2: Choose the correct answers from the given alternatives (2 points each)

1. _____are generally written methods outlining how to perform a task with minimum risk to people, equipment, materials, environment, and processes.
   a. risk assessment b. work place procedures c. hazards d. none
2. One of the following PPE is used for hand protection
   a. face musk b. glove c. helmints d. boots

Note: **Satisfactory rating – 4.5 points** **Unsatisfactory - below 4.5 points**

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 3- Using, maintaining and storing PPE cloth and equipment

3. Use and store PPE and equipment

A comprehensive personal protective equipment (PPE) program not only can be one of the easiest safety and health programs your department can implement and maintain, but it also can be one of the most beneficial. Before we even consider PPE we must follow the hierarchy of controls (Engineering, Administrative and then PPE). First take the hazard out of the work areas by instituting engineering controls, e.g., ventilation hoods, gas cabinets, guarding, etc. Then, consider administrative controls, e.g., limit the amount of time an individual is allowed to work with or is exposed to a given hazard. Last is personal protective equipment. Since PPE can fail, and relies on the worker to use it properly, and leaves the hazard in the workplace, PPE is always our last line of defense against workplace contaminants and physical hazards.

Why do we use PPE? Experience tells us that we can prevent most workplace injuries with the help of properly selected, worn and maintained PPE. In some cases it's also the law! According to state law all employees are required to wear at least safety glasses in our laboratories. Most laboratories also require gloves and lab coats, plus other unique PPE.

3.1 Maintenance and Storage for PPE

Where PPE is provided, adequate storage facilities for PPE must be made available for when it is not in use, unless the employee may take PPE away from the workplace, e.g., footwear or clothing. All PPE must be stored in a clean and sanitary condition ready for use. Accommodation may be simple, e.g., pegs for waterproof clothing or safety helmets, and it need not be fixed, e.g., a case for safety glasses, a container in a vehicle, or zip-lock bags on a designated shelf. Storage should be adequate to protect the PPE from contamination, loss, damage, water or sunlight. Proper storage often requires a dry and clean place that is not subject to temperature extremes. A hard hat

hanging in the back window of a truck, for example, may suffer sun and heat damage that prematurely ages the shell, reducing worker protection. Where PPE may become contaminated during use, storage should be separate from any storage provided for ordinary clothing. Some departments maintain a supply of PPE. Individual units may arrange for the supply of required PPE to staff. Regardless of the arrangements for supply, it is management responsibility to ensure that correct PPE is available and a program is in place. When considering arrangements for providing replacement PPE it must be remembered that unless a task requiring PPE can be stopped, avoided or delayed until new PPE is obtained, replacement PPE must always be readily available.

Employees must take reasonable steps to ensure that PPE provided is properly used.

For example:

- PPE must be worn and used in accordance with the instructions provided;
- Employees must take all reasonable steps to ensure that PPE is returned to proper storage after it has been used (unless the employee may take PPE away from the workplace e.g. footwear or clothing);
- PPE must be examined before use;
- Any loss or obvious defect must be immediately reported to their supervisor; and
- Employees must take reasonable care of any PPE provided to them and not carry out any maintenance unless trained and authorized

Following proper cleaning, drying, maintenance and storage protocols will help to protect from exposed to harmful toxins. It is your responsibility to make sure that your PPE receives routine cleaning after every call and that it gives advanced cleaning when necessary from trained person.

Dirty PPE is a health risk;

- Inspect it as required
- Clean it correctly

Provide clean, dry, and well ventilated storage areas

- Provide dedicated space away from living areas and out of a apparatus bays

- Provide appropriate gear racks

Control exposure to light for PPE

- Be aware of windows and openings
- Do not store PPE in direct sun light

Minimize personal and the public exposure to solid or contaminated PPE

- Do not wear or store PPE in living areas
- Do not take solid or contaminated PPE home.

Self check 3- written Exam

Name…… ID…… Date…….

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

Short answer questions

1. Why do we use PPE? (1points)
2. Where and how we have to store PPE (1 point)
3. Describe how dirty PPE is a health risk (2 points)
4. All PPE must be stored in a clean and sanitary condition ready for use(2 points).

   a. true b. false

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

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 4- Implementing OHS procedures with the disease prevention and control strategies

4. Follow OHS procedures in animal disease prevention and control

Trans-boundary animal diseases (TADs) are epidemic diseases that are highly contagious and have the potential to rapidly spread, irrespective of borders, causing serious socio-economic damage. TADs can disrupt or hinder domestic production and sales and international trade of livestock and livestock products.

OHS Procedures to be followed while controlling and preventing of animal disease are the following

- Safe animal handling systems and procedures including zoonoses control, identify hazards, assess and report risks.
- Safe manual handling systems and procedures.
- Safe systems and procedures for outdoor work including protection from solar radiation.
- Appropriate use of PPE.

4.1 Key provisions for animal disease prevention and control

The policies and regulations put in place to prevent and control the spread of animal diseases can be looked at two levels:

1. Those addressing disease prevention and control at household or farm level
    - Establishment of a national animal health information system
    - Declaration of a previously infected area free from animal disease
    - Measures for the prevention and control of the spread of animal disease
2. Animal movement (breeds exchange, trade etc)
    - Establishment and supervision of quarantine stations
    - Establishment of entrance and exit posts
    - Export of animals, animal products and by-products

- Importation of animals, animal products and by-products
- Provisions applying to areas infected by animal disease including animal movement
- Animals movement permit

Self check 4- written Exam

Name…… ID…… Date…….

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

Short answer questions

1. Explain OHS Procedures to be followed to control and prevent animal disease (2 points)
2. Write policies and regulations required to prevent TADs at household or farm level and national level (4 points)
3. TADs can disrupt or hinder domestic production and sales and international trade of livestock and livestock products (2 points)

   a. false b. true

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

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 5- Disposing off wastes in line with environmental health policies and legislations

5. Introduction

Waste disposal is defined as the collection, processing, and recycling or deposition of an unavoidable by-product material. Waste is classified by source and composition. Broadly speaking, waste materials are either liquid or solid in form, and their components may be either hazardous or inert in their effects on health and the environment. During the healthcare delivery process, healthcare facilities (HCFs) can generate wastes and by-products. Healthcare waste is categorized as general and hazardous waste types. General waste is the largest portion which is originated from food preparation, administrative and housekeeping activities. Whereas, the hazardous waste is generated throughout the healthcare delivery process. It includes laboratory wastes, pathological, body fluids, and sharp wastes. According to the guidelines, six consecutive healthcare waste management (HCWM) steps should be implemented by the HCFs. This successful management process includes segregation, collection, storage, transportation, treatment, and end up with final disposal.

- **Segregation:** Separation of health care waste according to their category and labelling containers. It is the most important step to reduce the risk and amount of hazardous waste. Adequate waste management receptacles and proper personal protective device supply is the most determinant factors.
- **Collection:** Proper protective equipment and waste transporting utility supply such as waste bins, trolley and wheelbarrow
- **Storage:** Secured and adequate temporary waste storage space allocation space is vital. Waste storage time should be limited to 24-48hrs.
- **Transportation:** Proper personal protective equipment and easily cleanable sealed containers such as plastic buckets and trolleys can be used to transport waste from temporarily storage to their treatment/ permanent disposal.

- **Treatments:** Use of suitable treatment technology and proper protective device allocation is vital. The best and cost-effective treatment options should be selected based on the national environmental protection regulation.
- **Disposal:** Dispose waste in accordance with the requirements of applicable national/ international regulations. Establish a system of separate disposal of different types of waste.

Proper disposal of the health care waste has become a global concern due to its public health hazards. Poor health care waste management is a problem particularly in most developing countries. Several studies indicated that health care waste management is still at infancy stage and particularly it is a neglected activity in Ethiopia.

5.1 Medicines Waste Management and Disposal Directive in Ethiopia

- Return of Medicines Waste to Supplier/Manufacturer/Donor
- Controlled Non-Engineered Landfill:
  - ✓ Due to hazards to the environment and public, dumping medicines waste in uncontrolled non-engineered landfill is prohibited
  - ✓ Controlled non-engineered landfill shall be in compliance with Environmental Impact Assessment (EIA) and shall not affect the aquifer, other watercourses or air.
  - ✓ Controlled non-engineered landfill shall be located at least 50 meters away from any ground water source.
  - ✓ The controlled non-engineered landfill shall be protected from flooding, water entry and runoff.
  - ✓ It shall also be secured from scavenging by having security guards and security fence.
  - ✓ Controlled non-engineered landfill operation shall minimize:
    - ❖ The potential risks for polluting water resources and soil
    - ❖ The generation of landfill gas i.e. methane and carbon dioxide
    - ❖ Potential human exposure to volatile chemicals, d) Smell, vermin and fire,

- ❖ Destruction of natural/virgin sites, and
- ❖ Long term cost intensive clean-ups, remediation and monitoring (aftercare, close-up).

- Disposal by controlled non-engineered landfill method shall not be used for the following hazardous wastes:
  - ✓ hazardous liquid wastes and hazardous materials containing free liquids
  - ✓ highly volatile and flammable liquid wastes
  - ✓ wastes containing appreciable quantities of mineral oils
  - ✓ strong oxidizing/reducing wastes
  - ✓ shock sensitive explosives
  - ✓ compressed gases
  - ✓ highly reactive wastes
- Burning in Open Containers or Place:
  - ✓ Paper and cardboard packaging, if they are not to be recycled, may be burnt.
  - ✓ Expired cotton and gauze may be disposed by burning.
  - ✓ Medicines waste shall not be disposed by burning at low temperature in open containers.
  - ✓ Polyvinyl chloride (PVC) plastic containers shall not be disposed by burning

5.2 Types of Medicines Waste and Their Disposal Methods

A. **Solids, Semi-Solids and Powders:** Solid, semi-solid and powder medicines waste shall be disposed by high temperature incineration. The disposal of solid, semi-solid and powder medicines shall comply with the following procedures:

- Solids, semi-solids and powders shall be removed from their outer packaging but shall remain in their inner packaging and placed in clean plastic or steel drums, for treatment according to the encapsulation method.
- Outer packaging shall be disposed of as non-drug, non-chemical materials by recycling or burning.

B. **Liquid medicine disposal:** Medicines with no or low toxicity that can be categorized as readily biodegradable organic material such as liquid vitamins and IV fluids may be diluted and flushed into sewer.

- Ampoules shall be crushed on a hard impermeable surface or in a metal drum or bucket. Ampoules shall not be burnt or incinerated.

C. **Vials**: vials shall be crushed and disposed using the encapsulation or inertization method. Vials of anti-neoplastics and anti-infective medicines shall not be crushed.

D. **Disinfectants:** Small quantities of diluted disinfectants shall be disposed to the sewer. Large quantities of disinfectants shall not be flushed into the sewer.

E. **Medical Supplies:**

- Expired syringes shall be buried in sharp pits or disposed using landfill after encapsulation.
- Plastic syringes after being detached from the needles may be: Buried on-site or disposed of in a land fill after shredding by hand mill/ electric shredder, or buried on-site or disposed of in a land fill without being shredded.
- Expired gauze, cotton, suturing materials, bandages or IV sets may be disposed of as normal waste to landfill.

Self check 5- Written Exam

Name…… ID…… Date…….

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

Part 1: Short answer questions

1. Define medical wastes? (1 point)
2. Explain types of veterinary medical wastes and their disposal methods (3 points)

Part 2: Choose the correct answer from the given alternatives (2 points each)

1. Successful waste management process includes one of the following methods
   a. segregation b. Collection c. Storage d. all
2. _____ is separation of waste according to their category and labeling containers.
   a. treatment b. storage c. segregation d. transport
3. Medical waste management and disposal directives in Ethiopia include:
   a. Return of Medicines Waste to Supplier/Manufacturer
   b. Controlled Non-Engineered Landfill
   c. Disposal by controlled non-engineered landfill method
   d. Burning in Open Containers or Place
   e. All

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

Answer Sheet

Score = _____

Rating: _____

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

LG # 51	LO 2- Identify major trans-boundary animal diseases and their impact in the region

Instruction sheet

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

- Identifying major trans-boundary animal diseases
- Recognizing means of transmission of TADs
- Recognizing public and economic importance of trans-boundary animal diseases in the country

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

- Identify major trans-boundary animal diseases in the country
- Recognize means of transmission of TADs
- Recognize public and economic importance of trans-boundary animal diseases in the country

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
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6. If you earned a satisfactory evaluation proceed to the next information sheet
7. If your performance is unsatisfactory, see your trainer for further instructions

Information sheet 1- Identifying major trans-boundary animal diseases

1. Introduction

Trans-boundary animal diseases are highly contagious epidemic diseases that can spread extremely rapidly, irrespective of national borders. They cause high rates of death and disease in animals, thereby having serious socio-economic and sometimes public health consequences while constituting a constant threat to the livelihoods of livestock farmers. With increasing globalization, the persistence of trans-boundary animal diseases (TADs) in the world poses a serious risk to the world animal agriculture and food security and jeopardizes international trade.

All animal diseases have the potential to adversely affect human populations by reducing the quantity and quality of food, other livestock products (hides, skins, fibers) and animal power (traction, transport) that can be obtained from a given quantity of resources and by reducing people's assets. Trans-boundary Animal Diseases (TADs) may be defined as those epidemic diseases which are highly contagious or transmissible and have the potential for very rapid spread, irrespective of national borders, causing serious socio-economic and possibly public health consequences. These diseases which cause a high morbidity and mortality in susceptible animal populations constitute a constant threat to the livelihood of livestock farmers. Furthermore, their potential consequences are of such a magnitude that their occurrence may also have a significant detrimental effect on national economies.

Trans-boundary animal diseases have the potential to: threaten food security through serious loss of animal protein and/or loss of draught animal power for cropping; increase poverty levels particularly in poor communities that have a high incidence dependence on livestock farming for sustenance; cause major production losses for livestock products such as meat; milk and other dairy products; wool and other fibers and skins and hides, thereby reducing farm incomes.

Table 1: Major Trans-boundary Animal Diseases and species affected

TADs Disease	Animals Affected	Remarks
Foot-and-mouth disease (FMD)	Cattle	Present in Ethiopia
Peste des petits ruminants (PPR)	Sheep & goats	Present in Ethiopia
African swine fever (ASF)	Pigs	
Blue tongue (BT) Sheep & cattle	Sheep & cattle	
Rift Valley Fever (RVF)	Cattle & shoat	
Contagious bovine pleuropneumonia (CBPP)	Cattle	Present in Ethiopia
Lumpy skin disease (LSD)	Cattle	Present in Ethiopia
Sheep and goat pox	Shoat	Present in Ethiopia
Bovine spongiform encephalopathy (BSE)	Cattle	
Newcastle disease (ND)	Poultry	
Highly pathogenic avian influenza (HPAI)	Poultry	Present in Ethiopia
Bovine spongiform encephalopathy (BSE)	cattle	

1.2 Major Trans-boundary Animal Disease

A. Contagious Bovine Pleuropneumonia (CBPP)

Etiology: The causative agent of contagious bovine pleuropneumonia (CBPP) is Mycoplasma mycoides subsp. mycoides (Mmm) small colony types. Mycoplasmas lack cell walls and are, therefore pleomorphic and resistant to antibiotics of the betalactamine group, such as penicillin. Growth of mycoplasma is relatively fastidious and requires special media rich in cholesterol (addition of horse serum). Mycoplasma mycoides subsp. mycoides does not survive for long in the environment and

transmission requires close contact. However, under favourable atmospheric conditions of humidity and wind, aerosols can transport the agent for longer distances.

Inactivated within 60 minutes at 56°C and 2 minutes at 60°C pH: Inactivated by acid and alkaline pH. Inactivated by many of the routinely used disinfectants. Susceptible to 1% sodium hypochlorite, 70% ethanol, iodophores, gluteraldehyde and peracetic acid. Inactivated by mercuric chloride (0.01%/1 minute), phenol (1%/3 minute), and formaldehyde solution (0.5%/30 seconds). Survives outside the host for up to 3 days in tropical areas and up to 2 weeks in temperate zones. May survive more than 10 years frozen

Species affected: Cattle, both Bos taurus and Bos indicus, are the main hosts. Infections have also been reported from Asian buffalo (Bubalus bubalis) and yak (Poephagus grunnien, formerly Bos grunnien). Sheep and goats can also be naturally infected, but with no clear associated pathology. Wild bovids and camels.

Transmission: CBPP is spread mainly by inhalation of droplets from infected coughing animals, especially if they are in the acute phase of the disease. Although close and repeated contact is generally thought to be necessary for transmission, transmission may occur up to 200 metres under favourable climatic conditions. The organism also occurs in saliva, urine, fetal membranes and uterine discharges. Transplacental infection can occur. Nonclinical bovine carriers with chronic infection are an important source of infection, and may retain viable organisms in encapsulated lung lesions (sequestra) for up to 2 years o it is widely believed that recovered animals harbouring infectious organisms within pulmonary sequestra may become active shedders when stressed or immune-depressed. Cattle movement and cattle gatherings are important factors in the spread of the disease. Outbreaks usually begin as the result of movement and contact of an infected animal with a naive herd. There are a few anecdotal reports of transmission on fomites, but Mycoplasmas do not survive for long periods in the environment, and indirect transmission is thought to be unimportant. Close, repeated contact is generally thought to be necessary for

transmission; however, Mmm might be spread over longer distances (up to 200 metres) if the climatic conditions are favorable.

Sources of infection: Bronchial secretions, nasal discharges, exhaled air and nasal aerosols.

- Saliva, urine, fetal membranes and uterine discharges
- Spread of infection through urine droplets was not fully confirmed
- Microorganisms have also been isolated from bull semen, but transmission through semen requires further investigation
- Nonclinical bovine carriers, including subclinically infected cattle, can retain viable organisms in encapsulated lung lesions (sequestra) from several months up to two years.
- These animals are thought to be capable of shedding organisms, particularly when stressed or immunodepressed

Clinical signs: The incubation period for contagious bovine pleuropneumonia can be 3 weeks to 6 months, with most cases becoming apparent in 3–8 weeks. After experimental inoculation of large doses into the trachea, the clinical signs appeared in 2 to 3 weeks. Clinical sign of CBPP is unreliable as initial signs may be slight or non-existent and may be indistinguishable from any severe pneumonia. The disease may occur in peracute, acute, subclinical and chronical forms.

A few cattle with CBPP may die peracutely with no clinical signs other than fever. Acute cases in cattle are characterised by nonspecific signs of fever, loss of appetite, depression and a drop in milk production, followed by respiratory signs, which may include coughing, purulent or mucoid nasal discharges, and rapid respiration. Clinical signs can differ in severity between outbreaks, but some cases progress rapidly to dyspnea. Respiration can be painful, and animals may react intensely if pressed between the ribs. Respiration can be painful, and animals may react intensely if pressed between the ribs. Epistaxis and diarrhoea have been reported, and pregnant

animals may abort or give birth to stillborn calves. Severely affected cattle often die, typically within 3 weeks.

In adults

- Initial signs are usually a depressed, inappetent animal with moderate fever, followed by coughing, thoracic pain and increased respiratory rate. As pneumonia progresses, there is laboured respiration and dyspnoea, and animals prefer to stand with elbows abducted to decrease thoracic pain and increase chest capacity.
- Auscultation of the lungs may reveal a wide variety of sounds, depending on how severely the subjacent pulmonary parenchyma is affected o crepitation, rales, and pleuretic friction rubs are all possible o at percussion, dull sounds can be noticed in the low areas of the thorax.
- CBPP often evolves into a chronic disease, characterised by ill thrift and recurrent low-grade fever that may be difficult to recognise as pneumonia
- Forced exercise may precipitate coughing.

In calves

- Pulmonary tropism is not the general rule, and infected calves present arthritis with swelling of the joints
- Co-existence of pulmonary signs in adults and arthritis in young animals should alert the clinician to a diagnosis of CBPP

Lesions

- Gross pathologic lesions of the lung are characteristic and often unilateral; the affected pulmonary parenchyma is odourless.
- The predominant gross change is consolidation, or thickening, of individual lobules that become encased in markedly widened interlobular septa, resulting in the characteristic marbled appearance

- Interlobular septa become distended first by oedema, then by fibrin, and finally by fibrosis; the organism produces a necrotising toxin, galactan, which allows for this extensive spread through septa
- Abundant yellow or turbid exudate in the pleural cavity (up to 30 litres in severe cases) that coagulates to form large fibrinous clots
- Fibrinous pleurisy: thickening and inflammation of the pleura with fibrous deposits
- Interlobular oedema, marbled appearance due to hepatisation and consolidation at different stages of evolution usually confined to one lung
- Sequestra with fibrous capsule surrounding grey necrotic tissue (coagulative necrosis) in recovered animals
- Mmm can survive within these sequestra for months or longer, facilitating spread

Differential diagnosis:

- Acute bovine pasteurellosis
- Hemorrhagic septicaemia
- Traumatic pericarditis
- Ecchinococcosis (hydatid cyst)
- Actinobacillosis
- Abscesses
- Tuberculosis

Diagnosis

- Samples

  ✓ Samples from live animals include nasal swabs and/or broncho-alveolar washings, or pleural fluid obtained by puncture; blood and sera should also be collected

- ✓ Samples to be taken at necropsy are lung lesions, lymph nodes, pleural fluid and synovial fluid from those animals with arthritis
- ✓ Samples should be shipped cool but may be frozen if transport to the laboratory is delayed

Laboratory procedures or techniques employed

- Serological tests
- PCR
- In-vitro culture isolation
- Complement fixation test (CFT)

Prevention and control

Antibiotic treatment is not recommended in countries that wish to eradicate the disease because it may delay recognition of the disease and encourage emergence of resistant Mmm strains. In Africa, countries where CBPP is enzootic do not have the means to achieve eradication and cattle owners frequently treat their sick animals with antibiotics when observing respiratory signs (including when it is CBPP then). In fact, antibiotics which are effective against mycoplasmas reduce the clinical signs and shedding of mycoplasmas but do not allow a complete cure. In those countries, control of CBPP should be based primarily on vaccination but prudent use of antibiotic therapy could be advocated as a substitute for slaughter when slaughter cannot be achieved. The methods used for control depend on the epidemiological situation, animal husbandry methods in effect, and the availability and efficacy of veterinary services in a specific country.

In disease-free areas: quarantine, movement controls, serological screening and slaughtering of all positive herds. Control of cattle movements is the most efficient way of limiting the spread of CBPP. As the pathological lesions of CBPP are distinctive, and pathognomonic, abattoir surveillance for CBPP involving lung examination is a practical method for disease monitoring. It is recommended to isolate and identify the causative

organism in order to confirm an outbreak. In enzootic areas vaccination is very important in the control of CBPP to reduce its prevalence before eradication can be foreseen. The only vaccines commonly used today are produced with attenuated Mmm strains called T1 (T1/44 and T1sr). Vaccination campaigns must be implemented under quality management so that an effective vaccine dose is really injected to the animals.

B. Contagious caprine pleuropneumonia (CCPP)

Etiology: CCPP is caused by Mycoplasma capricolum subsp. capripneumoniae (Mccp). The virus is very fragile and not able to exist long in the external environment. On average only survives outside the host for up to 3 days in tropical areas and up to 2 weeks in temperate zones. Cultures can be inactivated by ultraviolet radiation within a few minutes. Inactivated by formaldehyde (0.05%/30 seconds) and a mercuric chloride (0.01%/1 minute). Many of the routinely used disinfectants will effectively inactivate the organism, e.g. phenol (1%/3 minutes).

Species affected: CCPP is one of the most severe diseases of goats. Sheep may be affected in CCPP outbreaks affecting mixed goat and sheep herds. Affects the respiratory tract, and is extremely contagious and frequently fatal. In naive flocks, the morbidity rate may reach 100% and the mortality rate can be as high as 80%. CCPP causes major economic losses in East Africa and the Middle East, where it is endemic.

Transmission

- Contagious caprine pleuropneumoniae is contagious.
- Disease is transmitted during close contact by the inhalation of respiratory droplets.
- Chronic carriers may exist, but this remains unproven.
- Some outbreaks have occurred in endemic areas when apparently healthy goats were introduced into flocks.

- Outbreaks of the disease often occur after heavy rains (e.g. after the monsoons in India), after cold spells or after transportation over long distances. This may be because recovered carrier animals shed the infectious agent after the stress of sudden climatic or environmental changes.

Sources of agent:

- Infectious aerosols.
- A carrier state is likely but not proven.

Clinical sign

- The incubation period under natural conditions is commonly six to 10 days, but may be prolonged (3– 4 weeks). Some experimentally infected goats develop fever as soon as three days after inoculation and respiratory signs as early as five days, but others become ill up to 41 days after exposure.
- CCPP should be suspected in the field when a highly contagious disease occurs in goats characterised by pyrexia of 41°C or greater, severe respiratory distress, high morbidity and mortality, and post-mortem lesions of fibrinous pleuropneumoniae with pronounced hepatisation and pleural adhesions.
- CCPP is strictly a respiratory disease.
- Peracute, acute and chronic forms occur in endemic areas.
- Peracute: affected goats may die within 1–3 days with minimal clinical signs.
- Acute: initial signs are high fever (41–43°C), lethargy and anorexia, followed within 2–3 days by coughing and laboured respiration. The cough is frequent, violent and productive. In the final stages of disease, the goat may not be able to move and stands with its front legs wide apart and its neck stiff and extended. Saliva can drip continuously from the mouth, and the animal may grunt or bleat in pain. Frothy nasal discharge and stringy saliva may be seen terminally. Pregnant goats can abort. Acutely affected goats generally die within seven to 10 days.
- Chronic: there is chronic cough, nasal discharge and debilitation.

- Acute disease is characterised by unilateral pneumonia and serofibrinous pleuritis with straw coloured fluid in the thorax. On cut surface, the lung is granular with copious straw-coloured 3 exudates. Pea-sized, yellow nodules may be found in the lungs; these nodules are surrounded by areas of congestion. Varying degrees of lung consolidation or necrosis can be seen, and the regional (bronchial) lymph nodes are enlarged.

Differential diagnosis

- Peste des petits ruminants, to which sheep are also susceptible
- Pasteurellosis, which can be differentiated on the basis of distribution of gross lung lesions

Diagnosis

- Samples: At necropsy, samples from active lung lesions should be collected for culture. Samples of pleural fluid, exudates from lung lesions, and regional lymph nodes should also be collected. Tissue samples for virus isolation should be collected aseptically, placed in a transport medium, kept cold, and shipped to the laboratory on ice packs. Samples should be frozen if they will not reach the laboratory within a few days; if necessary, samples can be stored at –20°C for months with little apparent loss of mycoplasmal viability.
- Laboratory technique employed: PCR, Complement fixation test (CFT) and Indirect hemagglutination (IHA)

Prevention and control

- Outbreaks can be eradicated with quarantines, movement controls, slaughter of infected and exposed animals, and cleaning and disinfection of the premises
- In endemic areas, care should be taken when introducing new animals into the flock
- Vaccines help prevent disease in some countries

- Some antibiotics, such as tetracycline or tylosin, can be effective if given early

C. Haemorrhagic Septicemia

Synonym: **Septicemic Pasteurellosis**

The disease is an acute septicaemia caused by *pasteurella multocida.*

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

Transmission: spread occurs by ingestion of contaminated foodstuff, the infection originating from clinically normal carriers or clinical cases. The saliva of affected animals contains large numbers of pasteurella during the early stages of the disease. Although infection occurs by ingestion, the organism does not survive on pasture for more than 24 hours.

Clinical signs: Clinically the disease is characterized by a sudden onset of fever (41-42ºc), profuse salivation, and submucosal petechiation.

- Severe depression and death within 24 hours.
- Localization may occur in subcutaneous tissue, resulting in the development of warm, painful swellings about the throat, dewlap, brisket or perineum, and severe dyspnoea may occur if the respiration is obstructed.

Post mortem findings: generalized patechial hemorrhages, particularly under the serosa and edema of the lung and lymph nodes. In a few animals hemorrhagic gastroenteritis may be present.

Diagnosis: tentatively, the disease is diagnosed based on history, clinical findings and necropsy findings but confirmatory diagnosis is done by isolation and identification of the causative bacteria.

Differential Diagnoses: anthrax, blackleg, and acute leptospirosis

Treatment: Oxytetracycline 10 mg/Kg body weight (10%), Iv or IM daily for 3 days, Trimethoprim-sulfamethoxazole 3-5 ml/45kg body weights IV or IM for 3 days, Penicillin 20000-30000 IU/kg body wt. IM or SC daily for 3 days, Sulfamethazine (liquid preparation) 150 mg/kg b. wt IV or orally daily for 3 days.

Prevention and control: Vaccination of susceptible group is effective to protect for at least 12 months. The effective control lies with institution of adequate management, rational executions of vaccines and care in the transportation of animals.

D. Foot and Mouth Disease (FMD)

Synonym: Aphthous fever

It is an extremely contagious acute disease of all cloven-footed animals that characterized by fever and vesicular eruption in the epithelium of buccal cavity, tongue, muzzle, feet, teat and udder.

Etiology: caused by *picorna virus* group (genus *Aphtho virus*). At least 7 immunologically distinct serotypes of the virus have been identified. These are A, O, C, SAT-1, SAT-2, SAT-3 and Asia-1. The virus is resistant to various external agents including common disinfectant. NaoH, formalin (1-2%), Na_2Co_3 (4%) have ability to destroy the virus within few minutes.

Occurrence: The disease is endemic in South America, central Europe and central African countries notably in Ethiopia and Tanzania.

Species Affected: Cattle are more susceptible. A wide range of hosts like sheep, goat, pig and camel are susceptible to FMD. Dog, cat and man may occasionally be infected after close contact with infected host.

Transmission: The disease spread at an extremely rapid rate through direct contact with infected animals. In tropical countries, spread is through ingestion of contaminated feed and water and inhalation of infected droplets. All the fomites like clothes, harness, beddings, straws, hay etc may get infected and therefore act as a source of infection. All

the secretion and excretions like urine, milk, faces and saliva remain infective. Cattle may remain carrier following recovery.

Clinical Findings: the morbidity is 100% but mortality is less in indigenous cattle and comparatively more in cross and pure breed cattle. The disease has an incubation period of 2-8 days. The signs are drooling and vesicles on the nares, in the buccal cavity and between the claws. Before the visible sign of illness, animals may show dullness, in appetence, fever and shivering followed by smacking of the lips, drooling and shaking or kicking of the feet. After vesicle formation there is pronounced salivation and lameness. Pregnant animals may abort. Hoof deformation may result in permanent lameness. Mammary gland involvement may result in mastitis and permanent impairment of milk production.

Necropsy Findings: The diagnostic lesions are vesicles or blisters. They may be found on the tongue, dental pad, gum, cheek, hard and soft palate, lips nostrils, muzzle, coronary bands, teat and udder, as well as in the myocardium (degenerative change) and in skeletal muscles.

Differential Diagnosis: MCF, BVD**,** Rinderpest, vesicular stomatitis, blue tongue.

Treatment: There is no specific treatment. Symptomatic treatments may be rendered depending on clinical manifestations. Antiseptic solution like potassium permanganate or sodium bicarbonate may be applied over mouth lesions. Similarly antiseptic or antibiotics may be given on feet lesions and lesions on mammary tissue.

Control: restrict animal movements

- Vaccination of all animals of an area/village is to be done at one time.
- A footbath or truck bath may be made at the entrance of village or farm.
- Always purchase fodder from a place where FMD has not been recorded for a period of 6 months or so.
- Try to isolate and confine the affected animals immediately after detection.
- Calves should not be allowed to suckle affected mothers and they should not be fed with milk from affected animals.

E. Lumpy Skin Disease (LSD)

Etiology: Lumpy skin disease (LSD) is caused by lumpy skin disease virus (LSDV), a virus from the family Poxviridae, genus Capripoxvirus, Neethling virus. Sheeppox virus and Goatpox virus are the two other virus species in this genus. LSDV is remarkably stable, surviving for long periods at ambient temperature, especially in dried scabs. LSDV is very resistant to inactivation, surviving in necrotic skin nodules for up to 33 days or longer, desiccated crusts for up to 35 days, and at least 18 days in air-dried hides. It can remain viable for long periods in the environment. The virus is susceptible to sunlight and detergents containing lipid solvents, but in dark environmental conditions, such as contaminated animal sheds, it can persist for many months. Susceptible to ether (20%), chloroform, formalin (1%), and some detergents, e.g. sodium dodecyl sulphate. Susceptible to alkaline or acid pH. No significant reduction in titre when held at pH 6.6–8.6 for 5 days at 37°C.

Species affected

- Morbidity rate varies between 10 and 20%. Mortality rates of 1 to 5% are considered usual.
- Hosts: LSDV is highly host specific and causes diseases only in cattle (Bos indicus and B. taurus) and water buffalo (Bubalus bubalis). There is evidence from a study in Ethiopia of differential breed susceptibility to LSD, with Holstein Friesian or crossbred cattle exhibiting higher morbidity and mortality due to LSD when compared with local zebu cattle. Extensive serological surveys of wild ruminant species in Africa have not identified a wildlife reservoir of LSDV.
- The virus appears to be highly host specific.
- LSDV is not zoonotic

Transmission

- The principal means of transmission is believed to be by arthropod vector. Though no specific vector has been identified to date, mosquitoes (e.g. Culex

mirificens and Aedes natrionus), biting flies (e.g. Stomoxys calcitrans and Biomyia fasciata) and male ticks (Riphicephalus appendiculatus and Amblyomma hebraeum) could play a role in the transmission of the virus. The importance of different arthropod vectors is likely to vary in different areas depending on the abundance and feeding behaviour of the vector.

- Infected bulls can excrete the virus in the semen, however transmission of LSD via infected semen has not been demonstrated.
- It is not known if transmission can occur via fomites, for example ingestion of feed and water contaminated with infected saliva.
- Animals can be infected experimentally by inoculation with material from cutaneous nodules or blood.
- Direct contact is considered to play a minor, if any, role in the transmission of the virus.

Sources of virus

- Skin nodules, scabs and crusts contain relatively high amounts of LSDV. Virus can be isolated from this material for up to 35 days and likely for longer. LSDV can be isolated from blood, saliva, ocular and nasal discharge, and semen.
- LSDV is found in the blood (viraemia) intermittently from approximately 7 to 21 days post-infection at lower levels than present in skin nodules.
- Shedding in semen may be prolonged; LSDV has been isolated from the semen of an experimentally infected bull 42 days post-inoculation.
- There has been one reported of placental transmission of LSD.
- LSD does not cause chronic disease.
- It does not exhibit latency and recrudescence of disease does not occur.

Clinical sign

- The incubation period is 28 days but Under experimental conditions, following the virus inoculation, the incubation period is between 4 and 14 days.

- LSD signs range from inapparent to severe disease.
- Fever that may exceed 41°C.
- Marked reduction in milk yield in lactating cattle.
- Depression, anorexia and emaciation.
- Rhinitis, conjunctivitis and excessive salivation.
- Enlarged superficial lymph nodes
- Cutaneous nodules of 2–5 cm in diameter develop, particularly on the head, neck, limbs, udder, genitalia and perineum within 48 hours of onset of the febrile reaction. These nodules are circumscribed, firm, round and raised, and involve the skin, subcutaneous tissue and sometimes even the underlying muscles. Large nodules may become necrotic and eventually fibrotic and persist for several months ("sitfasts"); the scars may remain indefinitely. Small nodules may resolve spontaneously without consequences
- Vesicles, erosions and ulcers may develop in the mucous membranes of the mouth and alimentary tract and in the trachea and lungs.
- Limbs and other ventral parts of the body, such as the dewlap, brisket, scrotum and vulva, may be oedematous, causing the animal to be reluctant to move.
- Bulls may become permanently or temporarily infertile.
- Pregnant cows may abort and be in anoestrus for several months.
- Recovery from severe infection is slow due to emaciation, secondary pneumonia, mastitis, and necrotic skin plugs, which are subject to fly strike and shed leaving deep holes in the hide.

Differential diagnosis

- Bovine papular stomatitis (Parapoxvirus)
- Pseudocowpox (Parapoxvirus)
- Dermatophilosis
- Demodicosis
- Insect or tick bites

- Rinderpes

Diagnosis

- Samples: samples to be collected for confirmation of LSD is Skin nodules and scabs, saliva, nasal secretions, and blood are suitable samples
- Polymerase chain reaction (PCR) is the least expensive and quickest method for detection of LSDV.
- Virus isolation (VI) followed by PCR to confirm the virus identity takes longer and is more expensive but has the advantage of demonstrating the presence of live virus in the sample. Electron microscopy can be used to identify the classic poxvirus virion but cannot differentiate to genus or species level.
- Serological tests: Virus neutralisation: this is currently the gold standard test for the detection of antibodies raised against capripoxviruses and ELISA are employed.

Prevention and control

- Free countries: Import restrictions on domestic cattle and water buffaloes, and selected products from these animals.
- Widespread vaccination campaign.
- Surveillance measures to detect LSD are recommended over a distance of at least 20 kilometres from an infected country or zone
- Infected countries: Control of LSD depends on restriction of movement of cattle in infected regions, removal of clinically affected animals, and vaccination. Movement restrictions and removal of affected animals alone without vaccination are usually not effective. Proper disposal of dead animals (e.g. incineration), and cleaning and disinfection of premises and implements are recommended for LSD. There is currently no evidence of the efficacy of vector control in preventing disease

F. Rift Valley Fever

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

Etiology: p*hlebo virus* (family *Bunyeviridae*).

Species affected: Cattle, sheep, camels, buffalo, monkeys and man are highly susceptible and goats moderately susceptible.

Occurrence: is conferred to Africa continent but it has great potential for spread to other countries. Losses are due mainly to deaths in young lambs and calves, although there may be a high incidence of abortions, and some deaths, in adult sheep and cattle.

Transmission: is by biting flies, chiefly mosquitoes

Clinical findings: In lambs and calves after an incubation period of about 12 hours there is sudden outset of high fever and incoordination followed by collapse and sudden death within 36 hours.

In adult sheep and cattle, abortion is the common sign. In fatal cases sudden death is preceded by high fever for 1-2 days. Goats show a febrile reaction but few other clinical signs.

Necropsy Findings: Extensive hepatic necrosis is the characteristic lesion. Venous congestion and petechiation in the heart, lymph nodes and alimentary tract.

Diagnosis: The hepatic lesions are characteristic; severe leukopoenia is a common finding. Serological tests like ELISA, hemagglutination, CFT and serum neutralization are used.

Differential Diagnoses: Blue tongue (in sheep), Ephemeral fever (in cattle), Enterotoxaemia and other causes of abortion.

Treatment: no specific treatment.

Control: - Prevent introduction of infected animals and human beings to free areas.

In endemic areas mosquito control is important to reduce the spread of disease

Both killed and living attenuated virus vaccines are available.

F. Rinder pest (cattle plague)

Rinder pest is an acute, highly contagious disease of ruminants and swine, characterized by high fever and focal, erosive lesions on the mucosa of the alimentary tract

Etiology: *Morbilli virus* of the family *paramyxo viridae*. The virus has some antigenic relationship to the virus of distemper, measles and peste des petitis ruminants (PPR)

Occurrence: it has been among the most devastating diseases of cattle. In out breaks, which occur in a highly susceptible population, morbidity rates 100% and mortality rates 50%(25-90%) are to be anticipated.

Species affected: All ruminants and pig are susceptible to infection with rinderpest virus. Wild ruminates are also affected and are a common source of infection and a very great hindrance to an eradication programme.

Transmission: Close contact with infected animals is usually necessary for spread of the disease to occur. Entry into animals occurs principally by inhalation and ingestion of contaminated feed and water.

Clinical Findings: Incubation period of the disease is 6-8 days.

- High fever (40.5-41.5ºc) followed by anorexia, reduced milk yield, lacrimation and a harsh staring coat occurs.
- Bubbly salivation stained with blood.
- Ocular and nasal discharges.
- Discrete, necrotic lesions develop on the inside part of lower lip, the adjacent gum, on the cheek mucosa at the commisures and the lower surface of the tongue. Similar lesions are common on the nasal, vulvae and vaginal mucosa.
- Severe diarrhoea and sometimes dysentery with tenesmus appear as lesions developing in the abomasum and intestine.

- For the last 3 to 5 days, there is a sudden fall in temperature accompanied by exacerbation of the mucosal lesions, dyspnoea, cough, severe dehydration and sometimes-abdominal pain.

Necropsy findings: The lesions are observed in the alimentary tract. Small, discrete, necrotic areas develop on the mucosa of the mouth, pharynx, first third of the oesophagus, nasal cavities, and abomasums and in severe cases in the first and last parts of small and large intestine.

Diagnosis: provisional diagnosis based on history of outbreak, clinical findings, and necropsy findings. Confirmatory diagnosis requires isolation and serological identification of the virus.

Differential Diagnosis: FMD, MCF, Mucosal disease, Haemorrhagic septicaemia, PPR (in goats), Bluetongue, Sheep and goat pox.

Treatment: There is no effective treatment

Control: It is important to apply a national eradication programme, i.e. Mass vaccination

- Complete Prohibition of imports of domestic ruminants; pigs and animal Products from enzootic areas are required.
- If out breaks of disease occurs, it has to be controlled by
  - ✓ Slaughter of the infected animals
  - ✓ By restriction of stock movements
  - ✓ Vaccination of all neighbouring animals.

G. Peste des Petitis Ruminants (PPR)

Synonym: Goat plague

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

Etiology: *Morbilli* virus of the family *paramyxoviridae*

Occurrence: prevalent in Africa and Middle East

Species affected: sheep and goats are highly susceptible to the disease. Sheep are less susceptible than goats; cattle are only subclinically infected .The mortality and morbidity rate is very high in young animals.

Transmission: Secretion and excretions of sick animals are the source of infection. Close contact is important for the spread of the disease. Entry into the animal body occurs through inhalation and ingestion of contaminated feed and water**.**

Clinical sign: fever (40-41^{0}c), dull coat, dry muzzle, congested mucous membrane and depressed appetite. Initially serous nasal discharge latter changed in to mucopurulent nasal discharge. Necrotic stomatitis affects the lower lip, gum, tongue and cheek. Profuse diarrhoea followed by dehydration, hypothermia and death. Broncho pneumonia may also develop.

Post mortem finding: necrotic lesions on the inside part of lower lip and the adjacent gum, cheeks near the commissure and on the ventral surface of the tongue.

Diagnosis: similar to Rinderpest

Differentia diagnosis; Rinderpest, CCPP, blue tongue, coccidiosis, mineral poisoning

Treatment: no specific treatment. Administration of antibacterial and anti parasitic drug to reduce secondary complication.

Control: It is important to apply a national eradication programme, i.e. Mass vaccination

- Complete Prohibition of imports of domestic ruminants; pigs and animal Products from enzootic areas are required.
- If out breaks of disease occurs, it has to be controlled by
- Slaughter of the infected animals
- By restriction of stock movements
- Vaccination of all neighboring animals.

H. Avian influenza

Synonyms: AI, flu, influenza, fowl plague

Etiology

- Influenza virus A (family Orthomyxoviridae)
- Influenza A viruses has 16haemagglutinin (H1-H16) and 9 neuraminidase (N1-N9) subtypes
- Avian viruses of the H5 and H7 subtypes have been associated with severe disease in chickens, turkeys and ducks

It can mutate easily from low pathogenic to highly pathogenic types

- Avian influenza viruses vary in their pathogenicity and range from mild respiratory disease to catastrophic losses associated with viscerotropic and pansystemic infection (HPAI or "fowl plague").

Epidemiology

- It occurs in most species of birds
- Mortality can range from low to near 100 percent
- World-wide in distribution

Transmission

- Wild birds serve as reservoirs and transmit infection to subsistence flocks or commercial units
- Direct infection due to contact between infected carriers and susceptible flocks
- Free flying birds do not show typical signs but act as source of infection
- Substantial disease problem seen in domestic turkeys and chickens

Clinical signs

Depends on the species affected, age, sex, concurrent infection, immune status, environmental factors, etc

- Rapidly ascending mortality characterized by both respiratory and nervous signs
- HPAI results in an acute and abrupt death and decline in egg production (initially soft-shelled eggs)
- Pronounced depression (birds sit or stand in a semi comatose state), huddling, and nervous signs(torticolis)
- Mild to severe respiratory signs (coughing, sneezing, rales, excessive lacrimation)
- cyanosis and petechiae of unfeathered skin

- Diarrhoea, inappetance and thirsty

Lesions

- Generally, lesions can be a variety of hemorrhagic, necrotic, and congestive changes.
- *subcutaneous hemorrhages*
- Edema of the head and cyanosis or hemorrhage on the comb and wattles
- Hemorrhages in the serosa of all viscera and in the mucosa and lymphoid structures of the intestinal and respiratory tracts
- Mild influenza results in tracheitis, pulmonary edema and airsacculitis (+ bacteria)
- Sinusitis of catarrhal to caseous in nature
- Catarrhal to fibrinous pericarditis and “egg peritonitis”

Diagnosis

- Clinical signs (vary dramatically) and lesions
- Isolation and identification of the virus
- Serology:- HI*, CFT and ELISA

Differentials Diagnosis: ND, mycoplasma infection and other bacteria

Control and Prevention

- rapid diagnosis, slaughter and disposal of affected flocks, quarantine of the affected area and concurrent surveillance with disposal of flocks demonstrating antibodies to AI
- Restriction on movement of flocks and products from foci of infection
- immunized using autogenous inactivated vaccines or recombinant vector products
- strict biosecurity can limit dissemination of avian influenza virus

I. NEWCASTLE DISEASE

Synonyms: Pneumoencephalitis/Ranikhet disease/Avian pest/Avian distemper/

Acute, rapid spreading, viral, contagious respiratory disease of birds of all species

Etiology

Avian paramyxovirus1

- Characterized by respiratory symptoms and/or encephalitis
- Lentogenic, mesogenic and Velogenic

Strains of ND virus have been grouped into five pathotypes on the basis of the clinical signs seen in infected chickens. These are:

- Viscerotropic velogenic: a highly pathogenic form in which haemorrhagic intestinal lesions are frequently seen
- Neurotropic velogenic: a form that presents with high mortality, usually following respiratory and nervous signs
- Mesogenic: a form that presents with respiratory signs, occasional nervous signs, but low mortality
- Lentogenic or respiratory: a form that presents with mild or subclinical respiratory infection
- Asymptomatic enteric: a form that usually consists of a subclinical enteric infection.

The less pathogenic strains may induce severe disease when exacerbated by the presence of other organisms or by adverse environmental conditions

Epidemiology

- The virus is very resistant, live in dust for 255 days
- Chickens and turkeys of **all ages**, are naturally affected.
- Others such as ducks, geese, pigeons, quail, sparrows etc. are also susceptible.
- In human, the virus can cause relatively mild pink-eye-like infection (mild conjunctivitis).
- In chicken, the pathogenecity depends on strain* of the virus, dose, route, age and environmental factors
- In general the younger the chicken the more acute the disease

Transmission

- Infection occurs either by the inhalation of virus in aerosol form or ingestion of contaminated feed or litter
- Virus is excreted through feces for about 3 weeks.
- Wind dispersal may occur over distances of 5 km
- Egg transmission does occur

Clinical signs

- Viscerotropic velogenic form (exotic ND, or Asiatic ND)
- highly contagious and lethal form
- watery discharge from nostrils, labored breathing (gasping), sneezing, facial swelling
- Greenish diarrhea, muscular tremor, *torticolis, paralysis of legs and wings* and opisthotonous may be apparent
- Mortality frequently reaches 100% in flock of fully susceptible
- the respiratory signs are seen before nervous signs

Neurotropic velogenic form

- Sudden onset of severe respiratory signs
- Nervous signs, dramatic fall in egg production, diarrhea is usually absent
- Loss of equilibrium, leg paralysis, walk in circles, posterior propulsion
- 50% (adult) to 90% (young) mortality, 100% morbidity

Mesogenic forms

- Respiratory signs in field infection (severe in chicks*)
- Marked drop in egg production (quality* and quantity)
- Nervous signs may occur but not common
- Respiratory distress, greenish diarrhea. Paralysis of wings and legs ortorticollis

Lentogenic (Hitchner's) form

- Mild respiratory infection.
- Mild form, mortality usually low.
- Impairment of appetite.
- Mild respiratory symptoms.

- Rapid drop in egg production, (characteristic)
- Mild tracheitis is the only observable lesion .

Lesions

Respiratory system

- Mucous in the trachea (? Hemorrhage and marked congestion)
- Air sacs may be cloud, yellowish or whitish.
- caseous or frothy slimy exudation in the windpipe, and congestion of lungs.

Digestive system

- Hemorrhage of mucosal layer of the pro-ventriculus, ceca, small intestine, gizzard fat, and liver
- Catarrhal enteritis. Hemorrhage and necrosis of the intestinal lymphoid follicles.

Nervous system

- No gross lesion in CNS
- Flaccid and degenerated follicles and egg yolk in the abdomen of laying chicken infected with Velogenic viruses
- The presence of hemorrhagic lesions in the intestine is important to distinguish VVND from NVND

Diagnosis

- based on history, signs and necropsy finding
- Laboratory diagnosis
  - ✓ Virus isolation.
  - ✓ Chick embryo inoculation
- Serological test: HI test is used most widely
- Animal (4-7 weeks-old susceptible chickens) inoculation
- Diagnosis with sentinel birds **(very susceptible to VVND**)

Differentials

- Coryza, **CRD, Infectious Bronchitis** and Fowl cholera

Prevention and control

- Slaughter infected and exposed flocks to eliminate sources of virus excretions.
- Thoroughly clean and disinfect the premises.

- Establish surveillance and reporting system
- Vaccination Program best method to control ND other than VVND
- Only to reduces loss due to mortality, but not infection
- Lasota, Roakin, B, and kimber

Killed virus vaccine

- Site of injection/ Breast muscle.
- Age:/ Any age.
- Advantage:/ No danger of bringing the disease to the farm.
- Duration of immunity: Immunity started about one week after vaccination, peak at 2-3 weeks, started to drop fast at 6-8 weeks, disappear in about 6 months.

Live virus vaccine

- Age: As young as days.
- Site: Eye is preferred over the nostril. Can be used as combination with IB vaccine in water.
- Revaccination should be done at 4 weeks and 4 months.

Self check 1- written test

Name…… ID…… Date…….

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

Part I: Short answer questions

1. Define trans-boundary animal disease (TADs) (2 points)
2. List major trans-boundary animal disease prevalent in Ethiopia (3 points)
3. Explain TADs of cattle, small ruminants and poultry in Ethiopia (2 points)
4. Why penicillin is **not** used as treatment for CBPP?(3 points)
5. What are the Important characteristic features of TADs?(2 Points)

Part II: Choose the correct answer from the given alternatives (2 point each)

1. Among the disease listed below one is not considered as differential diagnosis of CBPP. a. Acute bovine pasteurellosis b. Traumatic pericarditis c. FMD d. TB
2. One of the following disease is zoonotic and TADs
   a. Newcastle disease b. lumpy skin disease c. brucellosis d. PPR
3. _____is an extremely contagious acute disease of all cloven-footed animals that characterized by fever and vesicular eruption in the epithelium of buccal cavity, tongue, muzzle, feet, teat and udder.
   a. CCPP b. avian influenza c. rift valley fever d. FMD
4. Appropriate samples collected for confirmation of LSD is: a. Skin nodules and scabs b. milk c. urine d. feaces

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

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 2- Recognizing means of transmission of TADs

2. Means of Transmission of TADs

Many cases of the Trans-Boundary Animal Diseases (TADs) have been reported in various areas of the world during last decades. Such TADs are easily transmitted from one country to another, due to the rapid globalization including the increase of international trade in domestic and wild animals and animal products, to the expansion of human population, global climate changes, and changes of agricultural production systems and to microbiological adaptation.

The common ways of introduction of trans-boundary animal diseases to a new geographical location are through entry of live diseased animals and contaminated animal products. Other introductions result from the importation of contaminated biological products such as vaccines or germplasm or via entry of infected people (in case of zoonotic diseases). Even migration of animals and birds, or natural spreading by insect vectors or wind currents, could also spread diseases across geographical borders. Traditionally, trade, traffic and travel have been instruments of disease spread. Now, changing climate across the globe is adding to the misery.

International trade in live animals and animal products offers opportunities for pathogens and vectors to be transported across oceans and continents. However, with the exception of a few documented examples, such as, the multiplicity of routes of introduction, including active and passive dispersal of vectors, infected human hosts, animal movements and migration, transportation of goods and biological invasions such as, introduction, initial dispersal, establishment and spread, the specific contribution of globalization to disease emergence is inherently difficult to quantify.

TADs may be defined as those epidemic diseases which are highly contagious or transmissible and have the potential for very rapid spread, irrespective of national

borders, causing serious socio-economic and possibly public health consequences. These diseases which cause a high morbidity and mortality in susceptible animal populations constitute a constant threat to the livelihood of livestock farmers.

2.1 Strategies to prevent and control transmission of TADs

Various strategies need to be implemented to prevent and control trans-boundary diseases regionally and internationally. These include:

- Preventing incidence of trans-boundary diseases and disease transmitting vectors.
- Preventing incidence of trans-boundary diseases and disease transmitting vectors.
- Minimizing the movement of animals across the borders is essential.
- Also, prompt practice of quarantine
- Geographic information system (GIS) and remote sensing could be utilized as early warning systems and in the surveillance and control of infectious diseases
- Interrupting the human-livestock wildlife transmission of infections
- Establishing regional biosecurity arrangement with capacity for early disease warning system for surveillance, monitoring and diagnosis of emerging disease threats.
- Undertaking animal breeding strategies to create disease resistant gene pools
- Strengthening government policies to enhance agricultural/animal research and training, and technology development.
- Ensuring appropriate preparedness and response capacity to any emerging disease.
- Intensification of international cooperation in preventing spread of TADs. As TADs are a concern globally, cumulative effort is needed at international level to minimize the spread of infectious diseases across the borders.

Self check 2- written test

Name…… ID…… Date…….

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

Short answer questions

1. Explain means of transmission of trans-boundary animal disease (5 points)
2. Write the effect of globalization in the transmission of TADs (3 points)
3. Discuss strategies to prevent and control transmission of TADs (4 points)

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

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 3- Recognizing public and economic importance of trans-boundary animal diseases in the country

3. Economic and Public Importance of TADs

Trans-boundary animal diseases are permanent global threat for livestock farmers. TADs can easily spread to other countries and reach epidemic proportions; and where control management, including exclusion requires cooperation between several countries. TADs cause damage and destruction to farmers' property, may threaten food security, injure rural economies, and potentially disrupt trade relations. All animal diseases have the potential to adversely affect human populations by reducing the quantity and quality of food, other livestock products (hides, skins, fibers) and animal power (traction, transport) that can be obtained from a given quantity of resources and by reducing people's assets. The economic impacts of trans-boundary animal diseases can be complex and go beyond the immediate impact on the directly affected agricultural producers. In specific cases, the actual economic impact will vary depending on factors such as the type of trans-boundary animal disease, but the complexity of the effects often make the precise measuring of the economic impacts very difficult.

Production: The most direct economic impact of trans-boundary animal diseases is the loss of or reduced efficiency of production, which reduces farm income. The severity of the economic effect will depend on the specific circumstances. If the farm economy is relatively diversified, and other income opportunities exist, the burden will be reduced. Conversely, if the local economy is heavily dependent on one or a few vulnerable commodities, the burden may be severe and local food security impaired. The impacts of reduced productivity of animals can be long-lasting and diseases can have lasting effects on livestock output in a number of "hidden" ways (such as delays in reproduction leading to fewer offspring and the consequences of a reduced population) which often exceed the losses associated with clearly visible illness. Although the loss of output from trans-boundary animal diseases may appear easy to identify, it can nevertheless be difficult to measure in precise economic terms. Indeed, such an economic evaluation

should not simply measure the value of lost output multiplying estimated physical loss by the market price. This may indeed exaggerate the likely economic impacts of damage. Actual economic impacts will also depend on adaptation by farmers as well as possible market adjustments. Among the ways in which farm communities can respond are releasing stocks or selling assets, engaging in non-farm income earning activities etc. For these reasons, the welfare loss may be less than the value of lost output. Only if the farmer livelihood responses are very restricted, or the community economy is heavily dependent on the commodity affected by the disease are the welfare losses likely to exceed the value of lost output. Further, the difficulty of distinguishing the production impacts of diseases from other impacts, such as climate, has not been effectively overcome. Often disease epidemics coincide with changes in climatic conditions, such as drought, early rains, and other output-reducing events. Lack of record-keeping by farmers in developing countries adds to the uncertainty about how much a given change in production is attributable to diseases, how much to weather, how much to farm management, and other variables.

Price and market effects: Along with production impacts can come variations in prices, determined by the supply and demand effects induced by trans-boundary animal diseases. Market effects can similarly induce variations in wages for farm and processing employment and can otherwise spread through to upstream and downstream activities. Depending on the market for the affected agricultural products, an infestation or outbreak can lead to suddenly higher prices, if most production is domestically consumed, or to lower prices, if most production is exported and quarantine prevents such export but not domestic consumption. The relative effects on producers and consumers of the production shortfall will depend on the relative elasticities of demand and supply (that is the responsiveness of demand and supply to price changes). Negative price effects can also occur where consumer health concerns leads to reductions in demand.

Trade: Through the demand channel introduced diseases can have major implications for farmers and countries producing for export or wishing to export. Countries which are

free from major diseases will tend to protect their local agriculture by totally excluding the importation of livestock products from areas affected by specific animal diseases or by making importation conditional upon a series of precautionary measures. These trade implications of trans-boundary animal diseases can cause a greater economic impact than the direct production losses themselves. Conversely benefits of elimination of trans-boundary animal diseases can be very large. The desire to gain access to high-value export markets is, indeed, the driving force behind many animal disease eradication efforts.

Food Security and Nutrition: Trans-boundary animal diseases can often have significant negative impacts on food security and nutrition in developing countries. The growth of international trade in agricultural produce buffers the potential impacts of trans-boundary animal diseases on food availability, but there can still be major impacts on poorer communities that do not have access to substitute supplies. The food security impact is the paramount concern of many national policy-makers in developing countries and provides one of the main arguments in favour of international assistance for control programs.

Health and Environment: The main threat to human health arises from zoonotic diseases. Such transmission of diseases from animals to humans appears to have increased in recent years, perhaps due to increasingly intensive livestock production in areas of proximity to human populations. Increasing concern is arising over threats to the environment, either from diseases themselves, which might move into domestic wildlife, or from the control measures used combat diseases (e.g. disposal of risky tissues of cattle affected with BSE).

Financial Costs: There are also budgetary implications of trans-boundary animal diseases. Control measures generally involve budgetary outlays. These include costs for inspection, monitoring, prevention and response. Also, demands are often put on Governments to extend financial assistance to the affected producers. The costs of some of these measures are proportional to the size of the agriculture sector being protected, while others are less closely related. As for the benefits of control measures,

generally the benefits of prevention and emergency preparedness are not directly apparent and depend on assumptions about avoided costs of infections and disease outbreaks.

Self check 3: written test

Name…… ID…… Date…….

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

Short answer questions

1. Describe the socio-economic importance of trans-boundary animal disease (3 points)
2. What is the public health significance of TADs (2 points)
3. How TADs limits international trade? (3 points)

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

Answer Sheet

Score = _____

Rating: _____

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

LG # 52	LO 3- Participate in the agreed control and eradication of Trans boundary animal diseases

Instruction sheet

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

- Recognizing and reporting risks in handling TADs
- Following safe work practices
- Using, maintaining and storing PPE clothing and equipment
- Identifying and applying trans-boundary animals diseases control and eradication methods
- Undertaking Surveillance for TADs
- Checking health record and certificate for animal movement
- Quarantining and inspecting exit and entry point animals

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

- Recognize and report risks in handling TADs
- Follow safe work practices
- Use, maintain and store PPE cloth and equipment
- Identify and apply trans-boundary animals diseases control and eradication methods
- Undertake Surveillance for TADs
- Check health record and certificate for animal movement
- Quarantine and inspect exit and entry point animals

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.

3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to the next information sheet
7. If your performance is unsatisfactory, see your trainer for further instructions

Information sheet 1- Recognizing and reporting risks in handling TADs

1. Risks in handling trans-boundary animal disease

The majority of the trans-boundary animal diseases however do not cause epidemics in humans although occasionally humans can become infected. Zoonotic diseases among TAD's include diseases like Rift Valley Fever (RVF), Mad Cow disease (BSE), Bovine Tuberculosis and Highly Pathogenic Avian Influenza (HPAI). The viruses causing rinderpest, peste des petits ruminants, classical swine fever, as well as the causative agent of contagious bovine pleuropneumonia are not infective for humans. Foot-and-mouth disease (FMD) virus has been isolated from around 40 people worldwide following a mild course of disease bovine pleuropneumonia are not infective for humans. Foot-and-mouth disease (FMD) virus has been isolated from around 40 people worldwide following a mild course of disease. Rift Valley fever virus can infect humans, where it causes a febrile illness, which is sometimes complicated by haemorrhage (bleeding), encephalitis, and blindness. Between animals and from animals to humans the virus is transmitted by certain species of mosquitoes, which gives rise to the distinct association of Rift Valley fever (RVF) epidemics with periods of high rainfall. Humans additionally appear to contract the infection through direct contact with infected tissues and fluids of animals at slaughter.

Avian influenza is caused by various subtypes of type A influenza virus (Types B and also C exist, but these are not know to cause serious disease in humans). Influenza virus type A also circulates in pig, equine and human populations and mutates constantly. At times, major antigenic changes, so called antigenic shifts, occur which may result in local epidemics or even pandemics. Similarly, the current epidemic of avian influenza in Asia has affected (a so far limited number of) humans, most of which have died as a result of infection. Although the exact means of transmission of H5N1 to humans have not been identified, there is no clear-cut evidence of any human-to-human

transmission and infection with the virus is believed to have come through contact with infected birds.

Self check 1- written test

Name…… ID…… Date…….

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

Short answer questions

1. List zoonotic trans-boundary animal disease present in Ethiopia (3 points)
2. Describe means of preventing risks which can be occur as a result of handling sick animals (2 points)
3. Avian influenza is one of the trans-boundary animal disease affecting human (2 points)

Note: **Satisfactory rating – 3.5 points** **Unsatisfactory - below 3.5 points**

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 2- Following safe work practices

2. Safe work practices

There are common hazards in the veterinary industry. It is important to learn about these hazards and how they can be controlled so people at work are not exposed to risk. Safe work practices to be conducted in veterinary service delivery include the following.

Animals: Handling animals is an essential part of working in a veterinary clinic. Animals may be kept at the clinic following surgery, or while undergoing tests to diagnose illness. As animals must be handled in veterinary practice, and as their behaviour is not always predictable, there is no simple risk control which will eliminate the hazard entirely. Trained and experienced workers will be more capable of approaching an animal confidently and calmly. This is important, as animals will react to what they may interpret as aggressive behaviour if a worker is hesitant or afraid. There will be occasions when a second person another worker or the owner of the animal is required to calm the animal to enable examination or treatment. Away from the veterinary clinic, inexperienced or untrained workers should not be asked to work with animals. Some people suffer allergies to certain animals. Exposure may trigger asthma attacks, eye and nose irritation or allergic skin conditions. Washing your hands with soap and hot water after handling animals is important.

Hazardous Substances: There are many hazardous substances which must be used in veterinary practice including animal medications, anaesthetics, sterilising chemicals, cleaning products and solvents. Injuries caused through accidental exposure to hazardous substances include poisoning of specific organs or of the whole body, chemical burns, eye irritations, respiratory problems and skin conditions such as contact dermatitis. Hazardous substances must be stored securely and labeled clearly. A number of the substances used in veterinary practice must be kept in locked storage and accessed only by veterinary practitioners.

While access to the chemicals and drugs used for animal treatment will be limited to trained veterinary staff, you may be asked to use solvents, disinfectants and cleaning chemicals to perform routine tasks. These too are classed as hazardous substances, and you may need to wear gloves and other PPE to carry out cleaning tasks.

Sharps: 'Sharps' include syringes used to inject drugs, to take samples of body fluids (such as blood for testing), and to tranquillise or anaesthetize animals in veterinary practice. They are also used in euthanizing animals. Other sharps in veterinary practice include scalpels used in surgical procedures. These, like syringes, present significant health risks if not handled and disposed of with great care. They may be contaminated with animal blood and other body fluids, or with unknown substances. Sharps must always be disposed of into a clearly labeled and appropriate sharps container. The container must be puncture resistant and leak proof. It must have a lid or top which can be securely closed, and must carry a "biohazard" label. There are some standard procedures for treating blood and body fluids. The basic steps will usually include the following:

- gloves should always be worn where your hands could come into contact with potentially infected material (such as animal blood and body fluids)
- your hands must be washed with soap and water immediately after glove removal
- cleanup must be done in a way that will minimise splashing or spreading of droplets
- if some splashing may be unavoidable during cleanup, additional PPE (eye and face protection) should be used
- a solution of 1:10 bleach to water (or other approved disinfectant) should be used to disinfect surfaces and equipment (including cleaning equipment) where body fluids have been spilled.

Manual Handling: Lifting animals, replenishing stocks of tinned and dry food, stacking boxes are some examples of manual handling tasks you may have to do in the

veterinary industry. At times, your work tasks may involve bending and stretching as well as twisting sideways, or working with materials and equipment above shoulder height. All of these increase the risk of manual handling injury. Risk controls may include:

- organising the work to reduce the number of manual handling tasks involved
- providing mechanical lifting devices such as trolleys and hoists where appropriate
- making sure you do not work long shifts involving manual handling activity
- making sure the workplace layout allows enough space to move and work safely and comfortably

Slips, Trips and fall: A slip, trip or fall can result in serious injury: neck and head injuries can cause damage to the spinal cord and nervous system. Many employees have suffered permanent disabling injuries as a result of a fall. The risk of slips, trips and falls by providing suitable non-slip floor surfaces, good lighting and safe work procedures. In some work places, floor surfaces can be chemically treated to increase traction and ramps provided where floor levels change.

Biological Hazards: Exposure to some micro-organisms can result in severe infections, allergies or toxic effects. Exposure to some micro-organisms can result in severe infections, allergies or toxic effects. Biological agents can cause three types of disease: infections, allergies, and poisoning (or toxic) effects. Pathogenic micro-organisms can enter the human body by penetrating damaged skin, or by settling on mucous membranes. They can also be inhaled or swallowed, leading to infections of the upper respiratory tract or the digestive system. Whenever people are in contact while working with natural or organic materials like soil, clay, plant materials or substances of animal origin (fur, blood and other body fluids or excrement), they may be exposed to biological agents. Anyone exposed to these organisms in a veterinary environment is also at risk.

Even when you have been wearing disposable gloves for clean-ups, you must still wash your hands immediately afterward, with soap and hot water. Your employer should provide clothing, overalls, apron or other suitable apparel to protect your ‘street clothes', which can be changed after cleaning jobs which could expose you to biological hazards.

Self check 2: written test

Name…… ID…… Date…….

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

Short answer questions

1. Explain measurements to be taken for safe work practices to prevent biological hazards (3 points)
2. Mention safe work practices to be conducted in veterinary service delivery (5 points)
3. Write basic steps for safe work practices in standard procedures for treating blood and body fluids (2 points)
4. List hazardous chemical substances need safe handling practices (2 points)

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

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 3- Identifying and applying trans-boundary animals' diseases control and eradication methods

3. Trans-boundary animal diseases control and eradication

Due to multiple adverse impacts, it is necessary to effectively manage the TADs. If an introduction of TADs can be recognized early whilst it is localized and then a disease control program be quickly implemented, the prospects for eradication of the disease with minimal production losses and other costs are markedly enhanced. Conversely, if the disease is allowed to become well established in the country, eradication may be very costly and difficult. Accordingly, there are two key TADs combating principles early warning and early reaction.

a. Early warning: This refers to rapid detection of the introduction of, or sudden increase in the incidence of TADs. It embraces all initiatives, mainly based on disease surveillance, reporting and epidemiological analysis that would lead to improved awareness and knowledge of the distribution and behavior of disease outbreaks and which allow forecasting of the source and evolution of the disease outbreaks and the monitoring of the effectiveness of disease control campaigns.

b. Early reaction: This means to carry out without delay the disease control activities needed to contain the outbreak and then to eliminate the disease and infection in the shortest possible time frame and in the most cost-effective way, or at least to return to the status.

3.1 Trans-boundary Animals diseases control and eradication methods

Prevention, eradication and control of animal diseases, as well as public health assurance, are major functions of veterinary authorities in most countries. Strategies to control animal diseases differ from disease to disease but are often similar for the same diseases from country to country depending on the main objective of the measure employed. The success of these measures is dependent on a variety of factors amongst

which the strength and capacity of the veterinary services, cross-border efforts for disease surveillance, political will, diagnostic laboratory and financial support are important. Those countries that are successful in effectively managing animal diseases have strong animal disease policies and legislation.

Prevention of disease outbreaks is more cost effective than eradication and control after outbreaks have taken place. Effective and efficient organization of preventative measures following a risk assessment approach is essentially the first step in controlling the spread of disease. In addition, effective movement control and quarantine, vaccination, treatment and mass slaughtering can be used for disease confinement and eradication purposes. Each control measure acts by reducing the effective reproductive index of the infective agent in the population. It is not necessary to use all these control measures simultaneously. However, a combination of these measures may be required to avoid spreading of the infective agent from infected to clean animals.

a. Movement control and quarantine

The prevention of the interaction of wild and domesticated animals is often a necessary step in the prevention of disease outbreaks as some diseases can be easily exchanged between the two. The classical examples where diseases can be exchanged in this manner are foot-and-mouth disease (FMD), classical swine fever, avian influenza and even bovine tuberculosis. Separation of wild and domestic animals could be achieved by fencing or other physical or natural barriers like rivers, forests, mountains, thus effectively controlling the movement of animals and confining them to their respective territories.

In addition to separating wild and domestic animals, movement controls are also essential in separating animals of different disease status, such as vaccinated from unvaccinated animals. It is often necessary that these animals be identifiable in order to detect an animal that is wandering out of its rightful territory on time. Movement control also aims at controlling the translocation of possibly infective animal products either by

people or mechanically. It is often necessary that only products that have been rendered safe be allowed out of the infected area into areas that are free from disease. It may be necessary that vehicles and other mechanical means be disinfected with an effective disinfectant.

Quarantine is an extreme form of movement control where animals, their products and sometimes even handlers are confined to an area with limited movement in order to avoid contact with susceptible animals or their handlers. All the principles explained above are applicable.

b. Vaccination: Without doubt vaccination, when available and applicable, is still the most cost effective means of preventing and controlling and even eradicating infectious animal diseases. Vaccines are normally easily available, also to farmers, unless their application needs special attention. Vaccination can, however, interfere with future diagnoses of disease if an inappropriate vaccine has been used.

c. Treatment: Treatment can be aimed at treating the affected animal against the particular agent of concern or treating the animal to prevent it from being attacked by disease-carrying arthropods like ticks and insects. Dipping the animals, together with vaccination where appropriate, is still considered to be one of the most effective strategies against some arthropod borne diseases. Dipping, however, has to be properly applied as resistance to some acaricides is developing at an alarming rate.

d. Mass slaughtering: The availability of the technology enhancing the differentiation of diseased from vaccinated animals has contributed to an increase in public disapproval of some veterinary prophylactic measures such as mass slaughtering of livestock to control outbreaks of epizootic diseases. Although this is the case, slaughtering of infected animals will still be necessary in many circumstances. When a disease is diagnosed at the beginning of an outbreak there are many uncertainties about the consequences and success of control options.

e. Biosecurity: Good biosecurity means ensuring good hygiene practices are in place. It is a vital part of keeping disease away from livestock, preventing any spread between livestock and, for zoonoses, minimising the transfer to humans. Biosecurity measures address isolation of new and diseased animals; movement of people, animals and equipment; and procedures for cleaning and disinfecting facilities and vehicles. Biosecurity must be maintained in farms, markets, during transport and at slaughter.

3.2 Challenges in prevention, control and eradication of TADs

The international approach to management of TADs is based on the assumption that most can be eradicated. However, in developing countries, eradication of most TADs is impossible for the foreseeable future for a variety of technical, financial and logistical reasons. An effective national animal quarantine system should prevent the entry and establishment of TADs. However even the most sophisticated quarantine service cannot provide an absolute barrier. A disease outbreak in the neighboring country is always an immediate threat. Generally, multiple factors challenge TADs combating efforts. These are:

- There are many diseases for which there is inadequate supply of vaccines or there are no vaccines available.
- Required availability of cost-effective intervention or disease control strategies. Even if a technology is available, it is expensive to adopt at the point of use.
- Need for ensuring public awareness of epidemic animal diseases. Many farmers are unaware of the emerging diseases. As such, unless reported to concerned regional authority, an emerging disease may go unnoticed.
- Inadequate regulatory standards for safe international trade of livestock and livestock products.
- Long period bans from international trade/markets which is: 36 months for LSD and Sheep and Goat Pox, 24 months for CBPP and PPR, 12 months for FMD, CCPP and Newcastle Disease.
- Difficulties in elimination of trade barriers caused by diseases.

3.3 TADs control and eradication strategies

The international approach to management of TADs is based on the assumption that most can be eradicated. Though after strong challenges, the global eradication of rinderpest was a remarkable achievement for veterinary science and a victory for the international community. However, Rinderpest is the only animal disease eradicated in the world, to date. There are various programs to control and eradicate TADs. These are:

- An effective national animal quarantine system should always be in place to prevent the entry and establishment of TADs.
- Collective efforts and multiple management strategies are needed to prevent or control TADs.
- Strong Border Control: This encompasses preventing incidence of TADs and disease transmitting vectors; minimizing the movement of animals across the borders and prompt practice of quarantine protocol.
- Geographic information system (GIS) and remote sensing could be utilized as early warning systems and in the surveillance and control of infectious diseases.
- Early warning/Early reaction: Ensuring appropriate preparedness and response capacity to any emerging disease.
- Breaking disease transmission cycles: The human-livestock- wildlife transmission of infections should be interrupted and surveillance of TADs must focus at the wildlife-livestock interface must.
- Regional/International Cooperation: this involves establishing regional biosecurity arrangement with capacity for early disease warning system for surveillance, monitoring and diagnosis of TADs
- Strong Policy Support: government policies should work hard to enhance animal research and capacity building, and technological development.
- Breeding management: Undertaking animal breeding strategies to create disease resistant gene pools.

- Environmental Protection: Global warming and climate change predispose animals to newer infections.

Self check 3- written test

Name…… ID…… Date…….

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

Short answer questions

1. Explain the difference between control and eradication of animal disease (3 points)
2. Describe vaccination campaign (2 points)
3. Discuss animal's diseases control and eradication methods (5 points)
4. _____ means ensuring good hygiene practices in place (2 points)

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

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 5- Undertake Surveillance for TADs

5.1. Undertaking animal disease surveillance

What is disease surveillance? Disease surveillance is the continuous, systematic collection, analysis and interpretation of health and health-related data/information for the proper planning, implementation and evaluation of health services/interventions. Successful outcomes for disease surveillance are contingent upon the community to:

- Immediately detect and report cases to the nearest health institution (health post, health center or hospital) and animal health surveillance officer
- Facilitate proper and timely sample testing and provision of medical service to patients and counseling services for families.
- Support vaccination campaigns, quarantine, or treatment to prevent loss of life and limit or stop the spread of disease.
- Communicate with clarity and consistency with influential people, including elders and religious leaders, to pursue options for controlling disease spread in a timely manner.

Animal disease surveillance involves the deployment of personnel who will be moving in the field in a carefully programmed manner, using various methodologies to detect signs of livestock disease. National governments must realize that animal disease surveillance is a key function of their national veterinary services. In developing countries, properly supervised sub-professional groups (veterinary assistants, auxiliaries and community animal health workers and the like) are often important elements in surveillance systems, and must be singled out for special training. Objectives of animal disease surveillance may be the following:

- the early detection of livestock diseases of economic/food security/public health importance
- enabling early reaction to such diseases

- Correct identification of resource needs in the field so that existing resources can be correctly deployed in disease management.
- provision of strategic decision-making support

In designing a management plan, the normal information flow in a surveillance system will need to be taken into account, and every step in the flow properly monitored and controlled.

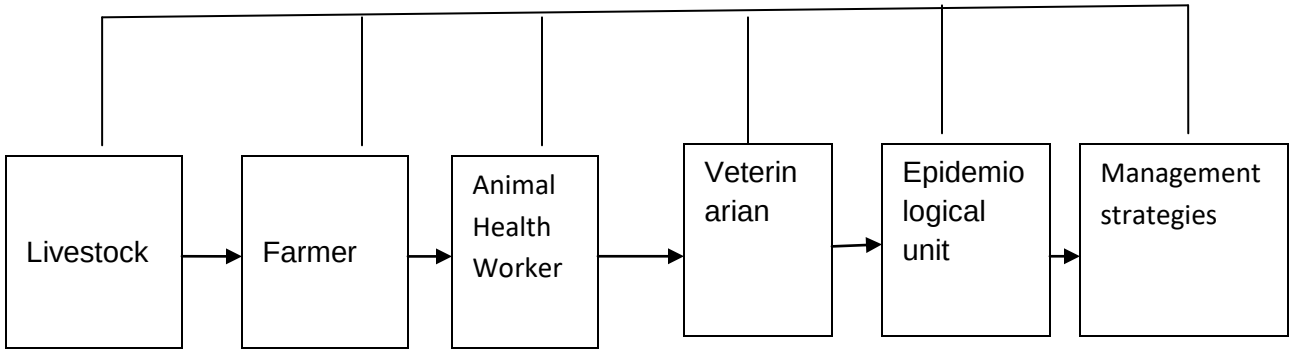

Diagram showing information flow in Surveillance and livestock disease management

A variety of management options exist when local, national, regional or international authorities face decisions on trans-boundary pests and diseases. Farmers commonly have to deal with disease incidence in their livestock. Modern disease management does not attempt to eliminate all diseases, but tries to create an environment which maintains the disease pressure at low levels. However, most trans-boundary animal diseases are too virulent or threatening to human health and trade relationships to tolerate, even at a low level. Therefore, prevention and subsequent elimination is a key element for the management of trans-boundary animal diseases. The best bet for successful disease control or eradication is to work out a risk-based strategy and to concentrate surveillance to identify areas of infection, areas of endemic maintenance and areas at high risk. Focused programs would be more efficient and economical.

Strategic interventions

- Develop and implement progressive control strategies for trade-limiting TADs such as Foot and Mouth Disease (FMD), Peste des petits Ruminants (PPR),

Sheep and Goat Pox (SGP), Contagious Caprine Pleuropneumonia (CCPP), Lumpy Skin Disease (LSD), Contagious Bovine Pleuropneumonia (CBPP).

- Promote commodity based and compartment approaches to reduce the risk of trade sensitive diseases.
- Promote regional approaches for TADs control and harmonize activities with neighbouring countries.
- Assist regional states to set priorities and strategies to controll non-TADs, sporadic and production diseases.

Self check 5- Written test

Name…… ID…… Date…….

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

Short answer questions

1. Define animal disease surveillance (3 points)
2. What are the strategic interventions applied for surveillance of TADs (3 points)
3. Discuss information flow in surveillance of livestock disease management (2 points)

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

Answer Sheet

Score = _____

Rating: _____

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

Information sheet 6- Check health record and certificate for animal movement

6. Introduction

Safe trade in animals and animal products is a fundamental and necessary requirement for the market chain. There are many opportunities, from farm to fork, for pathogens and other contaminants to render the animal or its products unfit for market and / or pose a risk to the health of other animals and humans. Animal Health Certification [AHC] is a formalized safe trade process undertaken by a qualified veterinarian who has been properly delegated the task by a country's Veterinary Authority. The duty of the certifying veterinarian is to provide, in writing, a professional, informed and signed opinion on the safety of animals / animal products and production processes for movement, trade or consumption.

6.1 Animal Health Certification in Ethiopia

There are no sanitary permits for livestock movement issued from origin of the animals at the farm or pastoral areas to the primary markets. Ideally there should be certification at the point of production to avoid problems of disease introduction when the animals congregate at market points. There is no pre-purchase inspection or certification of animals at the primary market places or along the stock routes. At the secondary markets however, most livestock exporters and export abattoirs engage private veterinarians to oversee the selection of healthy livestock. Animals may be held briefly in privately owned holding grounds which provide an opportunity for inspection and certification. In some holding grounds like Moyale and Harobeke the animals are vaccinated for black quarter and anthrax. A risk assessment should be conducted to determine which diseases pose a threat for animals in holding grounds and along stock routes.

Live animal exporters are fewer in number than traders and collect export animals from secondary markets. Some importers from Yemen and Djibouti are involved in

purchasing animals from the domestic market and exporting the same to their country through use of Ethiopian proxies. There is no formal certification and no movement permits to the secondary livestock markets in Ethiopia and there is a consequent risk of disease spread. Prepurchase inspection involves a visual and physical evaluation of the animal to identify any conditions that may indicate disease or illness. The pre-purchase inspector is responsible for identifying such animals and making decisions as to allow or reject them from being purchased.

If the pre-purchase inspector suspects the presence of disease the animals is rejected. In case of emerging and re-emerging trade sensitive diseases, the pre-purchase inspector also informs the Government veterinary inspector, who, on confirmation of the notifiable disease, immediately informs the Veterinary Services Directorate for further action. Pre-purchase inspectors are often poorly equipped to conduct comprehensive health examinations.

Self check 6- Written Exam

Name…… ID…… Date…….

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

Short answer questions

1. Explain the requirements of health record and certificate for animal movement (3 points)
2. Who can be authorized for providing health certificate for animal healthy approvals ?(1 point)
3. Discuss points where a veterinary inspector can check animal health certificate to prevent and control transmission of TADs from foreign country into Ethiopia (2 points)

Note: **Satisfactory rating ≥ 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

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

7. Definition of Animal Quarantine

The term quarantine means keeping in isolation animals which are to be introduced in a herd or territory for a definite period of time as a preventive measure against the spread of infectious diseases in a healthy population. The term quarantine comes from a latin word, “quarantum” that means forty that is to say a forty days period of detention. There is a hair line of difference between the quarantine and isolation is that in quarantine we separate and restrict the movement of healthy animals which may have been exposed to communicable diseases to see if they become ill but in isolation we separate ill having communicable diseases from those who are healthy. The quarantine period is usually equals to the longest incubation period of a disease. But in practice, a quarantine period of 30 days covers almost all diseases.

- **Isolation** applies to animal which are known to be ill with a contagious disease.
- **Quarantine** applies to those who have been exposed to a contagious disease but who may or may not become ill.

7.1 Quarantine Inspection at the entry and exit points

The State Bureau of Animal or its authorized port animal and plant quarantine organs shall be responsible for the examination and approval of quarantine inspection with respect to the import of animals, animal products and objects prohibited from entering the country. Procedures of examination and approval of quarantine inspection for import may be processed when the following conditions are satisfied:

- The exporting country or region has no serious animal epidemic
- The import of which is in compliance with the provisions of the relevant Ethiopian laws, regulations and rules on animal quarantine
- The import of which is in compliance with relevant bilateral quarantine agreements signed between Ethiopia and exporting country

Quarantine functionaries shall perform on the spot quarantine according to the following provisions:

- Check to see whether there are clinical symptoms of an epidemic
- Check to see whether there are signs of staleness or deterioration and whether the containers and packages are in perfect condition for animal products
- Quarantine inspection of export animals, their products and other quarantine objects shall abide by:
    - ✓ Provisions relating to animal quarantine of the importing countries or regions and Ethiopia
    - ✓ Bilateral quarantine agreements
    - ✓ Quarantine requirements clearly defined in the trade contracts
    - ✓ Animals shall be subject to clinical quarantine or re-quarantine by the port animal at the point of exit
    - ✓ Animal products or other quarantine objects with original means of transport from the place of consignment, clearance shall be given by the exit port animal and plant quarantine office upon examination of the certificates

Self check 7- Written Exam

Name…… ID…… Date…….

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

Short answer questions

1. Explain the difference between isolation and quarantining of animals (2 points)
2. What to be checked at the exit and entry point of animals to prevent TADs? (2 points)
3. Write the procedures of examination and approval of quarantine inspection for importing animals and animal products (2 points)
4. Mention requirements must be fulfilled for exporting of animal and animal byproducts according to Ethiopian legislations (2 points)

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

Answer Sheet

Score = _____

Rating: _____

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

LG # 53	LO 4- Record and reporting TADs

Instruction sheet

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

- Recording and reporting the incidence of TADs
- Recording and reporting unidentified disease incidence

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

- Record and report the incidence of TADs
- Record and report unidentified disease incidence

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to the next information sheet
7. If your performance is unsatisfactory, see your trainer for further instructions

Information sheet 1- Recording and reporting the incidence of TADs

1. Introduction

Disease **incidence** refers to the proportion or rate of animals' developing a condition during a particular time period. **Prevalence** refers to proportion of animals that have a condition at or during a particular time period. There are two types of reports accomplishing by veterinary offices. Routine activities reports contain specific cases, curative service of veterinary clinics and health posts and mass vaccinations information whereas outbreak reports are only included information of outbreaks occurred.

1.1 Livestock disease reporting and surveillance system

Disease reporting systems are based on reporting of animal health-related events to the Veterinary Authority. Data derived from disease reporting systems can be used in combination with other data sources to substantiate claims of animal health status, to generate data for risk analysis or for early warning and response. Effective laboratory support is an important component of any reporting system. Reporting systems relying on laboratory confirmation of suspected clinical cases should use tests that have high specificity. Whenever the responsibility for disease reporting falls outside the scope of the Veterinary Authority, for example human cases of zoonotic diseases or infections or infestations in wildlife, effective communication and data sharing should be established between the Veterinary Authority and other relevant authorities. Participatory surveillance methods may be useful to collect epidemiological data that can support disease reporting systems.

Veterinary offices report routine activities of veterinary clinics/posts through hierarchal chains from local to district to province/region and finally to national office. The reports are submitted to their respective high level veterinary offices on monthly, quarterly and annually basis. The formats of routine activities reports are in general, prepared in such a way to collect type of species, age and number of animal treated; type of diseases diagnosed; and type of drug used for treating. Species and number of animals

vaccinated and type vaccine used data could be included to these reports format if vaccinations were done. Irregularity in reporting and poor recording and documentation of data collected from specific cases are observed as weaknesses of routine activities reporting animal disease in Ethiopia. The veterinary offices complained that reporting was not frequently done according to the schedules.

Lack of transport facilities, communication problems and absence Animal Health Assistance on the duty stations are as main reasons for not being reported timely. Name and Peasant Association of owners, species and age of animal treated, clinical findings, laboratory diagnosis results, disease diagnosed and type and dose administered treatment are found on format to be recorded at clinics and health posts. Since the collected data was not well recorded and documented, it was so difficulty to use the data in future studies.

1.1.2 Animal disease Outbreak reporting system Ethiopia

The outbreak reporting formats of animal disease in Ethiopia are found be well prepared so as to collect all important epidemiological data. Sometimes, these outbreaks could be immediately reported to high veterinary office if there is no vaccine or budget available to take action and to National Veterinary Laboratories if they are unknown and serious. Fast reporting at community level for some outbreaks, well prepared reporting format and regular allocation is required.

The fast report is attributed to the consideration of mass vaccination in response to reports as benefits which increases acceptability and sustainability of the reporting of those diseases at community level. In line with this, the improvement of communications such as mobile services in the area was found to be opportunity for timely reporting outbreaks. However, transport and communication are still found the two limiting factors in reporting system. These problems are resulted in irregular/absence of outbreak reports for some remote health posts. Some outbreaks of important diseases, such as Foot-and-Mouth Disease (FMD) were not reported. Since veterinary offices had not taken any measure for those diseases outbreak reports of livestock owners for long

time, the community didn't report to veterinary offices. Therefore, these weaknesses of the existing reporting system were attributed to lower the capacity to report all field disease events.

Self check 1- Written test

Name…… ID…… Date…….

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

Short answer questions

1. Discuss the routine activities disease reporting and outbreak disease incidence reporting (2 points)
2. What are the importance of fast reporting of animal disease incidence (2 points)
3. Write the difference between animal disease incidence and prevalence (3 points)
4. Explain animal disease outbreak reporting system Ethiopia (3 points)

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

Answer Sheet

Score = _____

Rating: _____

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

2. Reporting unidentified animal disease

Unidentified animal disease incidence is a disease of animals in which the etiology is unknown earlier and occurs in the form of outbreak at a certain period of time in one area. Accurate and timely surveillance and reporting is critical for early detection, identification and monitoring of disease progression in a particular area. The data supplied by the surveillance system will serve as an early warning system to detect animal diseases, track trends of Trans-boundary Animal Diseases, identify populations that are at great risk, implement control measures such as targeted vaccination, movement restrictions, voluntary cessation of export trade, assessing the social and economic impact of the disease, etc. Currently disease surveillance and reporting is poor and irregular in Ethiopia.

2.1. Strategic interventions of animal disease surveillance and reporting in Ethiopia

- Develop and enforce guidelines for veterinary information and disease outbreak reporting including obligations of private practitioners from village to national level.
- Introduce new technologies such as digital pen and mobile phones to enhance the quality of reporting system.
- Enhance the timely and accurate confirmation of suspected disease outbreaks which is currently very low.
- Expand the information system to include data from veterinary laboratories, abattoirs and quarantine stations.
- Strengthen feedback systems to the regions and districts through newsletters, bulletins, websites etc.
- Carry out regular surveillance for diseases selected on risk assessment to inform control strategies.

- Strengthen and capacitate federal and regional epidemiology units with adequate staff and facilities.
- Promote use of participatory Diseases Surveillance (PDS) in disease investigation.

Self check 2- Written test

Name…… ID…… Date…….

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

Short answer questions

1. Define unidentified animal disease (2 points)
2. Write factors causes poor and irregular reporting of unidentified and identified animal disease incidence in Ethiopia (4 points)
3. Write strategic interventions of animal disease surveillance and reporting systems in Ethiopia (2 points)

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

Answer Sheet

Score = _____

Rating: _____

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

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The trainers who developed the learning guide

No	Name	Qualification	Educational background	TVET College	Phone. No.	E-mail
1	Dr. Addisu Bedashu	A	DVM	Holeta PTC	0910281160	addisubedashu@gmail.com
2	Dr. Boki Negesa	A	DVM	Holeta PTC	0920563622	bokanegesa@gmail.com
3	Dr. Abate Worku	A	DVM	Holeta PTC	0923382973	abateworku48@gmail.com
4	Dr. Derere Dejene	A	DVM	Kombolcha TVET	0910749376	deraradejene@yahoo.com
5	Dr. Milkessa Tesema	A	DVM	Chancho TVET	0912257297	mengistut38@gmail.com