

ANIMAL HEALTH SERVICE DELIVERY BUSINESS

TRAINING COURSE FOR YOUTH AGRI-ENTREPRENEURS

Ethiopian Agricultural Transformation Institute



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OVERVIEW OF THE MODULE

The Ethiopian Agricultural Transformation Institute (ATI) has recently launched a project known as “Agriculture-focused Dignified Employment for Youth in Ethiopia (ADEY)” program to showcase gender inclusive jobs creation, particularly for girls in Ethiopia. To make the program successful, it was crucial to develop robust training modules to be used as a casting stone to guide youth organized into Micro, Small and Medium Enterprises (MSMEs).

The main objective of this training module is to provide knowledge, and the skills required in delivering quality animal health services at the community level. As a matter of fact, the youth entrepreneurs organized into animal health delivery services greatly contribute to the welfare and health of animals and subsequently to the healthy and safe foods. Moreover, it helps the youth and jobless girls to create jobs as a means to sustain their livelihoods. This training module highlights the types of inputs and materials required to provide community animal health services. Under the technical skill part of this module, the whole process, from the purchasing of vaccines and drugs to the techniques to administer and conduct animal husbandry activities, is discussed in detail.

The Agriculture-focused Dignified Employment for Youth (ADEY) program is implemented by the Ethiopian Agricultural Transformation Institute in partnership with the Mastercard Foundation to enable 611,343 inclusive and dignified work opportunities for young women and men and support youth entrepreneurship, employability, and sustainable livelihoods in the agribusiness sector.

INTRODUCTION

In Ethiopia, the livestock sub-sector plays a vital role in ensuring food security, providing traction power, generating rural income, and creating household employment. Beyond its socio-cultural significance, livestock also contributes to the national economy through foreign exchange earnings. However, despite the country’s abundant livestock resources, their contribution to the broader economy remains limited. A key reason for this gap is the high prevalence of both infectious and non-infectious diseases, which significantly reduce cattle productivity and lead to illness, death, and even global market restrictions.

For livestock producers across the country, animal diseases are a major concern. One of the primary challenges they face is the inadequate provision of animal health services, which are largely managed by the public sector. Farmers consistently identify poor veterinary service delivery as a major barrier to improving livestock productivity.

Although reform efforts have been made over the past decades, delivering adequate veterinary care to smallholder farmers continues to be a serious challenge. Both the reach and quality of veterinary services remain insufficient across the country’s various livestock production systems. Private sector involvement in clinical veterinary service delivery is also limited. Most private actors operate in pharmaceutical retail or drug importation, while clinical and diagnostic services are largely confined to Addis Ababa, serving a small number of commercial farms.

In response to these challenges, this training module aims to close the gap by equipping young entrepreneurs with the skills and knowledge needed to deliver quality clinical veterinary services—including treatment, vaccination, and technical husbandry practices—to smallholder farmers across wider geographic areas.

Training Methodology

TRAINING APPROACH

- The training modules will be delivered through:
- Theoretical presentations supported with pictorial demonstration
- Participatory approach and demonstration/ videos
- Field visit and orientations
- Tailored practical training
- Brainstorming
- Presentation
- Group discussion
- Exercise
- Self-education (for online version)

TRAINING MATERIALS

- Stationery
- Flipchart
- Whiteboard
- PC and LCD
- Markers of different colors
- Equipment for demonstration

Total time required: 8 days, 8 hours per day

TARGET PARTICIPANTS

This training module is useful to clinician youths and practitioners (females and males) who have an educational background on basic animal health service level I to level III, general animal health service providers, advanced animal health service providers, veterinary medicine, veterinary pharmacists and others related fields to deliver animal health service business.

SECTION 1: CLINICAL SIGNS OF DISEASE AND DIAGNOSIS METHODS

OVERVIEW

There are various clinical signs of disease in animals which may differ according to the types of causative agents. Disease diagnosis methods may depend on

species of animals, nature and routes of disease, and the availability of diagnostic tools.



LEARNING OUTCOME

The trainees equipped with knowledge and skills on identifying healthy and diseased animal and the different methods of diagnosis

Time required: Half a day



LEARNING QUESTION

1. Do you know the clinical signs of sick animals?
2. What are the characteristics of healthy animals?
3. How do you diagnose disease in animals?

1.1. IDENTIFYING HEALTHY AND SICK ANIMALS

There are various types of disease signs that animals would manifest depending on the causes of disease. In the below table some of the characteristics of healthy and sick animals are listed

Table 1: Characteristics of healthy and sick animals

HEALTHY ANIMAL	SICK ANIMAL
Clean and moist nose, no ulcer in and around mouth	Sores or ulcers on feet or inside mouth (this may result in a reluctance to eat or move)
Good appearance, alert and normal behavior	Excessive salivation
Undamaged knees with regular movement	Reduction in milk yield, egg production
Good rumens fill and strong chewing activity	Diarrhea
Steady almost soundless breathing	Excessive discharge

Good body size/weight and fat	Emaciation (loos of weight), Unexplained deaths
Normal body temperature and heart rate, clean hindquarters, good appetite	Loss of appetite
Soft symmetrical udder	Lameness, drop the head, separate from the herd
Shinny hair all-round with no wounds	Rough hair coat

1.2. PHYSICAL EXAMINATION METHOD DISEASE DIAGNOSIS

There are different types of disease diagnosis methods depending on the species of animals and nature and route of the diseases. Some of the physical examination methods of disease diagnosis are listed below.

Inspection: inspections, including distant examination, audiovisual inspection is carried out some away from the animal before the animal is handled and might best be undertaken during the period devoted to obtaining the case history. The general appearance of the animal should be noted, and its behavior, posture, gait, condition, conformation, skin, eating, defecation, urination, voice, respiration, abdomen, external genitalia, orifices, and mammary glands are some of the spots to be visually inspected.

Palpation: Palpation is aimed at determining the size, shape, consistency and temperature of the organs, and to detect the presence of pain in a tissue by noting increased sensitivity. It may be direct (by means of fingers), or indirect (with a probe). Palpation may be light or deep. Light palpation is feeling the tissue gently, while deep palpation is applying pressure to gain more information about the consistency of tissues, to detect pain or to feel abdominal structures through the abdominal wall.

Percussion: Percussion is striking a part of the body to set deep parts in vibration and produce audible sounds vary when reflected because of the difference in density of the tissues.

Auscultation: Auscultation is listening to the sounds produced by the functional activity of an organ located within a particular part of the body, to assess its physiological state. It is used to evaluate the normal and abnormal sounds of the respiratory tract, heart and alimentary tract. Crepitating sounds produced by abnormal joints may also be heard by auscultation. It can be direct by placing the ear to the body surface over the organ to be examined or indirect by using stethoscope that is more preferred method.

1.3. REQUIRED INPUTS AND EQUIPMENT

- Rope
- Nose twitch
- PPE (gloves, gown)
- Thermometer
- Stethoscope



POST ASSESSMENT QUESTIONS

1. Write 4 common clinical signs of diseased animals
2. What are the characteristics of healthy animals?
3. Describe the physical examination methods of disease diagnosis

KEY MESSAGE

Effective history taking with proper diagnosis method is important to tentatively identify a disease

SECTION 2: DISEASE TRANSMISSION, PREVENTION AND CONTROL METHODS

OVERVIEW

Animal diseases can be spread by various routes of transmission, direct contact is one of the main diseases spread way between animals. Animal diseases have been prevented by methods involving environmental control (including the maintenance of safe water supplies, the hygienic disposal of animal excrement, air sanitation, pest control, and the improvement of animal housing), and regular



LEARNING OUTCOME

The trainees equipped with knowledge and skills on disease transmission ways and the methods how to prevent and control the occurrence and spreading of disease

Time required: Half a day



LEARNING QUESTION

1. Do you know about the transmission ways of disease?
2. What methods of disease prevention do you know?
3. What methods of disease control do you know?

vaccination. Isolation of sick animals, surveillance and providing proper treatment would help in controlling animal diseases.

2.1. WAY OF DISEASE TRANSMISSION

Animal diseases can be spread by five main routes of transmission:

- Direct contact: directly contact with diseased animal and human (zoonosis)
- Inhalation of aerosols: inhaling infectious agents from air
- Ingestion: ingestion of infectious agents through feed or water
- Indirect transfer by fomites: equipment, footwear, vehicles
- Vector transmission: through vectors carrying the infectious agents

2.2. DISEASE PREVENTION AND CONTROL METHODS

- Prevention
- Vaccination
- Quarantining of the newly purchased animals

- Deworming
- Elimination of carriers
- Prevention of environmental contamination
- Disinfection of animal house
- Generally, by applying strict biosafety and/ or biosecurity measures

CONTROL: GENERALLY, ANY ANIMAL DISEASE CAN BE MANAGED BY CONTROLLING

- Intermediate host, vectors and reservoirs
- Internal parasites
- Arthropod pests
- Reducing the infection as soon as an outbreak occurs
- Isolation of sick animals
- Treatment of sick animals



POST ASSESSMENT

1. Write 3 ways of disease transmission
2. List down at least 4 methods of disease prevention
3. List down at least 4 methods of disease control

Prevention is much better than treatment; provide advisory extension services

SECTION 3: VACCINATION AND TREATMENT

OVERVIEW

Vaccination is used to prevent the occurrence of diseases while treatment is used to control the spreading of diseases. To protect the animals from disease and to contain the damages imposed by disease, it is critical to implement proper vaccination and treatment techniques. Rabies vaccination service would be an easy entry point to quickly start service provision in the community.

3.1. VACCINATION



LEARNING OUTCOME

The trainees equipped with knowledge and skills on the routes of vaccination and treatment, vaccination and treatment techniques, precautions before, during and after vaccination and treatment.

Time required: 4 days, 8 hours per day



LEARNING QUESTION

1. Do you know how to handle and store vaccines?
2. Do you know the routes and administration techniques of different types of drugs?
3. Do you know the precautions before, during and after vaccination and treatment?

3.1.1. BEST PRACTICE IN HANDLING, ADMINISTRATION AND STORAGE OF VACCINES

- Handling and use
- Always check with your vet prior to vaccine administration.
- Always read and understand the manufacturer's instructions before use.
- Colostral antibodies may interfere with the immunity stimulated by some vaccines when used in young cattle. Always check the appropriate age to administer each vaccine.
- Only vaccinate healthy animals.
- Record all vaccines given to animals e.g. date, animal number, type of vaccine used etc. using the template in this booklet or your own records.
- Never mix vaccines or administer within 14 days of each other unless the manufacturer's instructions state otherwise.
- Never use the same needle or syringe for different vaccines.

STORAGE

- Vaccines should always be stored in a fridge at 2oC- 8oC.
- Always check the shelf-life of the product and never use expired vaccines. Once opened (seal broken), check the longevity of the product.

NEEDLES

- Always use appropriately sized needles for each animal and route of injection e.g. short needles (0.5-1.0 inches) for subcutaneous injections and longer (1.5 inches) for intramuscular injection. Short needles should be used on younger animals.
- A new needle per animal is preferable. Needle sterilization is mandatory if multiple animals be treated with the same needle.
- All needles should be sterile and sharp.

DISPOSALS OF VACCINES

- Read manufacturers guidance sheet for proper disposal method
- Always dispose of sharp needles in a dedicated container labelled 'SHARPS'

3.1.2. FACTORS AFFECTING EFFECTIVE IMMUNIZATION

I. BEFORE ADMINISTRATION

It is essential to plan animal handling procedures carefully to prevent unnecessary stress or discomfort during vaccination. A thorough understanding of the medical history of the herd or individual animals is also important before administering vaccines. Vaccination should be avoided in pregnant animals during the first month of gestation and in poultry at the peak of egg production. Vaccines should not be given to animals that are visibly ill, have a fever, are under corticosteroid treatment, or are receiving immunosuppressive drugs, as their immune response may be compromised. Caution is also necessary when using vaccines containing herpesvirus strains, due to their ability to cause latent infections. A vaccine that is harmless for animals at one age may induce disease in younger or more vulnerable animals.

II. DURING THE VACCINATION

The vaccine must be properly administered. The following factors should be considered: dose, administration route, and homogeneity (all animals must receive the same dose of the vaccine).

III. AFTER THE VACCINATION

Keep the animals in mild environmental conditions.

3.2. TREATMENT

3.2.1. ROUTES OF DRUG ADMINISTRATION

Intramuscular: IM All intramuscular injections must be administered in the neck muscle. Inject in the center of the illustrated triangle area bounded by the spine (A), the ligament of the neck (B) and shoulder line (C). Use a 16-to-20-gauge needle, 2.5 to 4 cm long (1 to 1.5 inches).

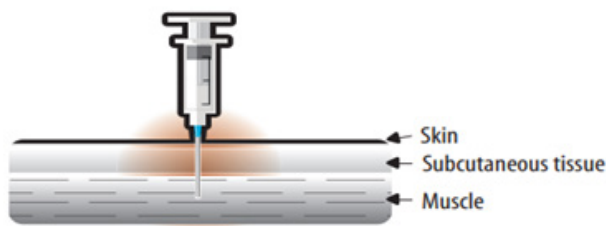


Figure 1. Figure demonstrating routes intramuscular drug administration

Subcutaneous: SC In order to minimize carcass damage, insert the needle in a skin fold of the neck, forward of the shoulder. Use a 16-to-20-gauge needle, 2.5 cm long (1 inch).

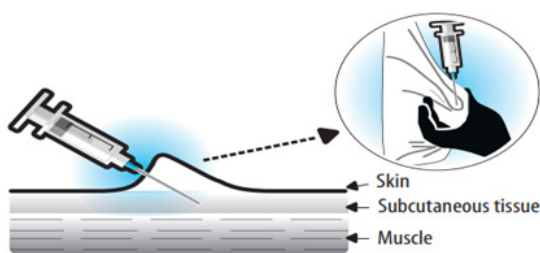


Figure 2. Figure demonstrating subcutaneous drug administration

INTRAVENOUS (IV) INJECTIONS

- Restrain the animal
- For larger volumes (>250 ml) warm the solutions in a water bath immediately prior to administration until temperature reaches body temperature (37.5°C-38.5°C). Attach IV tube to bottle or bag.
- Raise the vein by pressing in the jugular groove with your thumb.
- Insert the needle at 30-45° angle to the skin and wait for drips of blood from the needle hub before attaching the IV tube. If there is a fast stream of bright red blood the needle may be in the carotid artery.
- Ensure the fluid is flowing through the IV tube before attaching it to the needle. This confirms the needle is in the jugular vein.
- Regulate the flow to a slow steady rate using the Flow Control Clamp or pinch the tube.
- On completion of injection, remove the needle and apply digital pressure to the site to ensure hemostasis

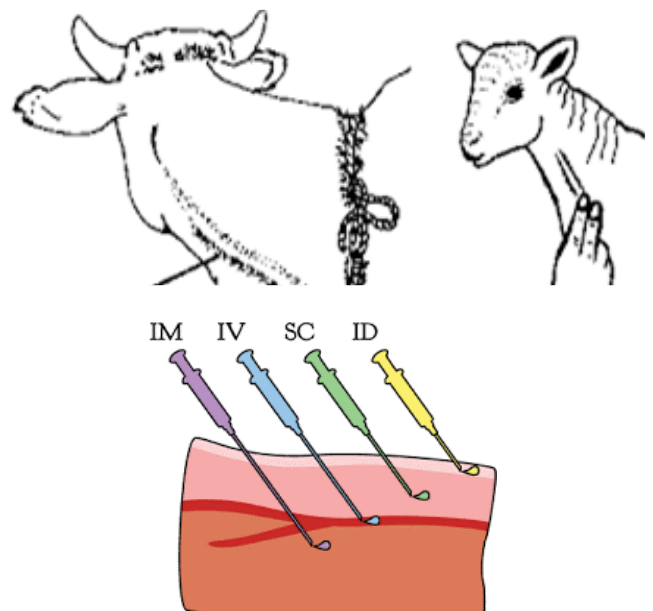


Figure 3. Figure demonstrating intravenous drug administration

- Intra-Mammary Infusion
- Use products only approved for intramammary infusion
- Make sure the environment is clean and restrain the cow as needed

- Prepare all necessary Materials
- Practice aseptic technique to avoid introducing pathogens into the teats and prevent damaging the interior of the teat canal
- Don clean disposable gloves
- Milk out the quarters completely
- Disinfect the end of the teat with clean alcohol swab, starting with the furthest teats and finishing with the nearest to avoid contaminating it with your sleeve. Repeat as needed until the swab remains clean.



Figure 4. Figure demonstrating intramammary drug administration

ORAL ADMINISTRATION: BOLUS (PILLING)

- Properly restrain the animal
- Load the treatment bolus into the bolus gun or applicator
- Place the animal's head under the neck rail and elevate the head
- Open the animal's mouth by placing several fingers in the interdental space (between the lower jaw front teeth and the upper jaw back teeth). Rubbing the roof of her mouth will make her relax and open it making it much easier and safer to get the bolus gun in. Insert the bolus gun through the side of the cow's mouth and advance past the base of the tongue. Note: It's normal for the animal to chew on the balling gun as she swallows it
- Allow the animal to swallow
- Slowly let the end of the gun work its way down while applying pressure. (Do not force it down you will damage the esophagus). Once the handle reaches the corner of the mouth, press the plunger to deliver the bolus to the back of the throat and swallowed
- Gently remove the balling gun and wash it



Figure 5. Photo of balling gun for deworming

ORAL ADMINISTRATION: DRENCHING

- Restrain the recipient animal with a halter and tie her head up under the neck rail or above the side of the box stall to reduce her ability to swing her head. If a cow is very weak, and cannot stand, ask a second person to hold her head.
- Place the stomach tube into the cow's mouth and then gently advance down the esophagus into the rumen- Once the stomach tube has advanced most of the way down the esophagus it meets resistance at the point where it enters the rumen, slightly rotate the tube while advancing it to help pass it all the way into the rumen
- Hold the probe in place while a second person pumps the fluid.
- Slowly pump the drench/ fluids into the cow. Note: Pumping too fast causes reflux into the esophagus and throat
- The cow should be chewing on the handle of the probe/tube.
- Kink the hose before slowly removing the probe
- Untie the halter
- Rinse the exterior and interior of the hose by pumping hot water through it





Figure 6. Drenching guns for oral administrations

3.2.2. PRECAUTION DURING ADMINISTERING AN INJECTION

- Consult a veterinarian about the proper use of medication
- When indicated in label directions, administer medication subcutaneously
- Restrain the animal properly
- Avoid injecting in the rump or thigh
- Do not inject through dirty skin
- Select the correct needle gauge for the viscosity of the product injected
- Inject a small volume per site: no more than 10 to 15 ml (follow label directions)
- Use a new needle for each treatment
- Never use a needle that is bent, worn or contaminated
- Always discard used needles and syringes in a container designed for that use
- Clearly identify treated animals

3.2.3. BEST PRACTICES IN TREATING ANIMALS

The label on the substance package/ bottle describes the appropriate routes of administration and dose of medication to administer. Always follow the label recommendations for dosage and volume per administration site unless directed to do otherwise by your veterinarian.

THE SUBSTANCE

- The pH of solutions injected subcutaneously or intramuscularly must have a pH of 7.3 to 7.45 and be isotonic (same tonicity as blood;

280–310 mosm/L). Non-isotonic solutions must be injected slowly if the intravenous routes are used.

- For larger volumes (>250 ml) warm the solutions in a water bath immediately prior to administration until temperature reaches body temperature (37.5°C–38.5°C).
- Verify the solubility of the substance. Precipitation may cause the formation of large particles which, if injected intramuscularly, can be painful. For intravenous injections, solutions, not suspensions, must be administered. Consult with the Herd Manager or Herd Veterinarian if in doubt.
- Inject different substances at different sites, at least 10 cm apart, to avoid cross-reaction of chemicals.
- Use the smallest possible gauge of needle.
- Substances to be injected must be sterile as contamination can lead to infection or irritation of the injection site. Sterilize solutions by autoclaving or microfiltration and use aseptic technique for injection (Wipe the bottle top and site of injection with alcohol).

NEEDLES

- Do not reuse needles. Use a new, sterile needle for every animal.
- Use only needles with aluminum hubs because they are less likely to break during injections
- Select the needle gauge depending on the viscosity of the substance. The thicker the substance, the smaller the gauge (e.g., a thick drug will require a 16-gauge needle while a less viscous drug will require a 20-gauge needle). Use the smallest gauge needle possible that allows accurate injection of the substance.

Volumes: Use the recommended volumes by the manufacturer

TECHNIQUES

- Use the subcutaneous route of injection whenever that option is available to reduce the risk of injection site lesions.
- Adequate restraint of cattle prior to injection is necessary to decrease the risk of injury to both the animal and humans.

- Calculate dosage and determine the route of injection per label or veterinarian's instructions.
- Expel air bubbles from the syringe before injection.
- The injection site must be free of manure and dust
- Do not inject into inflamed or damaged tissue (including abscesses)
- Vary the injection sites if multiple injections are required, placing the injection sites at least 4 inches apart.
- Ensure the proper placement of the needle prior to injection. Withdraw the syringe plunger; if blood enters the needle hub, the needle has entered a blood vessel. Unless it is an IV injection, withdraw the needle slightly and redirect it.
- No resistance should be encountered during injection. Do not apply overt pressure on the syringe plunger. The injected substance should flow freely to prevent any unnecessary pain and tissue damage.
- Give injections at a constant flow rate.
- If bleeding occurs after injection, apply pressure with gauze until bleeding stops.

Post treatment care: Monitor animals for reactions after administering antibiotics and provide all the necessary care.

3.3. REQUIRED INPUTS AND EQUIPMENT

- Different types of vaccine and drugs
- Antiseptics/disinfectant
- Vaccination syringe
- Ice box and ice pack
- Gloves
- For injections: Needles, Syringes
- For oral administration: Bolus gun or applicator (pilling), Stomach tubes or glycol drenching gun (drenching)
- For Intramammary Infusion: Teat dip, Gloves, Clean towels, Sampling tubes, Antibiotic tubes, Alcohol swabs



POST ASSESSMENT

1. What are the routes of drug administration?
2. Write the procedures for Intravenous injection
3. What are the factors affecting vaccine effectiveness?
4. Write the precautions during administering an injection

KEY MESSAGE

Always vaccinate only healthy animals using proper routes of drug administration and dosage calculation

SECTION 4: ANIMAL HUSBANDRY PRACTICES

OVERVIEW

Husbandry practices encompass all the measures adopted at the farm, from procuring and rearing healthy animals, and their welfare, to final slaughter or milking. Farm management is done in such a way as to keep animals in a healthy condition, provide adequate and contamination-free feed and water, and optimum living conditions.



LEARNING OUTCOME

The trainees equipped with knowledge and skills on animal husbandry practices such as castration, dehorning, hoof trimming, tail docking

Time required: 2 days, 8 hours per day



LEARNING QUESTION

1. What animal husbandry practices do you know?
2. What types of castration do you know?

4.1. HOOF TRIMMING

Hoof trimming is the process of trimming overgrown hooves that make walking difficult and predispose the animal to other foot problems such as foot rot; especially if animals are in damp, muddy environments. Bad hooves make walking painful and competing for feed difficult. This may cause the animals to go off their feed and stop exercising. Animals with overgrown hooves are also very susceptible to joint and/tendon problems, and to arthritis. Permanent damage can result if the foot is left neglected for extended periods of time.

Animals should be checked for hoof growth on a regular basis. Signs that might indicate the need to trim hooves include abnormalities in locomotion and/or animals showing signs of pain while walking.



Figure 7. Hoof trimmers for removing obstructs between hooves and removing abnormally growing hooves

STEPS IN HOOF TRIMMING

- Properly restrain the animal
- Clean any mud, manure, small stones, etc., from between the walls of the hoof
- Trim starting from the dewclaws-The best time to trim hooves is immediately after rain or heavy dew, because the hoof wall will be much softer and easier to trim. It is always advisable to begin by removing very small pieces of hoof wall and toe
- The inside wall of the foot should normally be

trimmed a little bit lower than the outside

- The foot should be kept clean and free of debris for a few days following trimming.



Figure 8. Figures for removing hooves obstructs and removing abnormally growing nails.

4.2. CASTRATION

Castration is the removal of the testicles of male animal. This can be done in a non-surgical manner in cattle, sheep, and goats with the use of an elastrator and Burdizzo. The elastrator places a very small but strong elastic band over the scrotum and above the testicles, cutting off the blood supply to the testicles. The testicles will generally slough off in a few weeks. Castration should be done at as young an age as possible.

Castration improves meat quality. Uncastrated/intact males tend to have a much stronger flavored meat. The meat is also generally leaner and drier, leading to reduced tenderness and lower consumer satisfaction. Castration can also make the animals much safer to be around as intact males tend to be more aggressive towards other animals or humans.

PROCEDURE FOR BURDIZZO METHOD

This method atrophy testes with an intact scrotum.

- Two testicles identified
- Each testis pulled ventrally into apex of scrotum

- Spermatic cord manipulated laterally
- 2 crushing sides on each spermatic cord
- 10 second crush time
- Proximal and distal crushing zone
- No not include median raphe



Figure 9. Burdizzo and emasculator for castrating male animals

4.3. DEHORNING/DISBUDDING, TAGGING/EAR NOCHING, DOCKING

DEHORNING/DISBUDDING

Horns on animals can and do cause bruises and other injuries to animals. Horns can also be a hazard to people and equipment. Dehorning/disbudding is the practice of removing an animal's horns or horn buds, depending on the age of the animal and the stage of horn growth. Dehorning/disbudding should be done between 7-10 days of age for goats and prior to 3 months of age for cattle. It should be pointed out that perhaps the most simple and effective method of dehorning is to select polled breeding stock (not always possible within some breeds and species).

Horns can be removed by using caustic paste, an electric dehorning iron, or with a mechanical dehorner (spoons, tubes, scoop type dehorner – all for use on cattle only). Caustic paste is placed on the horn bud. Care must be taken to not get the paste on yourself or in the animal's eyes. Electric dehorning irons are placed over the horn bud and burn the bud and surrounding tissue to "kill" the horn. For cattle, mechanical methods can be used. Care should be taken to keep the wound as clean as possible. Blood-stop powder should be on hand to help combat bleeding.

If you are unfamiliar with any of the dehorning/disbudding practices, you should have an experienced adult or your veterinarian teach you the proper technique.



Figure 10. Dehorners to dehorning abnormally growing horns

TAIL DOCKING

Tail docking is a common practice in sheep and swine production. It involves removing a portion of the tail by either banding (elastrator) or cutting.

Tails are docked on sheep to prevent problems with fly strike. Fly strike is a condition where manure accumulates in the hair/wool of a lamb's tail to the point that it provides habitat for fly larva to develop. The larva then begin to eat away at the soft tissue surrounding the anus of the lamb. It is recommended that lamb tails be docked at the distal end of the caudal fold.



Figure 11. Figure demonstrating how to dock tails.

4.4. REQUIRED INPUTS AND EQUIPMENT

- Sedatives, rope/halters
- Bandages, sponges,
- Disinfectant and antiseptics
- Eartags or notching tools
- PPE (gloves, gown)
- Scissors, blade and blade handle,
- Hoof trimmer,
- Dehorner, docking shears

- Surgical kits, first aid kits,
- Burdizzo, emasculator, rubber ring
- Dehorning knives, dehorning wire
- Waste containers



POST ASSESSMENT

1. Write the procedures for burdizzo method castration
2. Write the steps for hoof trimming

Key Message: Care should be given not go beyond the recommended portion

SECTION 5: FINANCIAL FEASIBILITY

OVERVIEW

Financial feasibility describes whether agri-business is financially viable. It involves determining initial investment (resource) requirement to start the business, estimating production cost, operation expenses, and sales revenue. These are used to determine the initial investment requirement, profitability of the business, break-even point (minimum level of production) to attain the profit zone, and pay-back period (number of years required to recover initial investment). These series procedures are used to make wise decisions to accept or reject the agribusiness investment alternative.



LEARNING OUTCOMES

Trainees equipped with:

1. How to determine initial investment requirement to start the business
2. How to estimate periodical production/ service costs, operating expenses, and sales revenue of the business
3. How to determine profitability and cash flow of the business
4. How to calculate break-even point

(minimum level of production) to recover total cost and generate profit.

5. To calculate payback period (time requirement to recover initial investment and
6. How to make decision to accept or reject the investment alternative

Required time: 4 hours



LEARNING QUESTION

1. Do you know how to determine financial feasibility of the given specific agri-business to make wise investment decision?

5.1. INITIAL INVESTMENT

- Initial investment is the minimum capital requirement to start the business.
- Example of initial investment requirement to start treatment, vaccination and husbandry business includes tools and equipment, storage shop, working capital, etc

Table 2: Template to estimate initial investment requirement for agri-business

DESCRIPTION	TOTAL COST	REMARK
Tools and equipment		
Vaccines		
Antiseptics/ disinfectants		
Vitamins		
Storage house		
Working capital		
Etc		
Total		

5.1.1. LONG-TERM INVESTMENT

- Long-term investment in agri-business involves all asset requirement for the business which can serve for more than one year.
- Example tools and equipment, storage shop, etc

Table 3: Template to calculate total cost for acquisition of long-term investment

TYPES OF INVESTMENT	UNIT OF MEASUREMENT	QUANTITY	UNIT COST	TOTAL COST

5.1.2. WORKING CAPITAL

Working capital for the planned agri-business includes all payments requirement for day-to-day operating activities such as production/service costs and operating expenses.

Example

- Production/service costs include cost of drugs, vaccine, antiseptics, labor cost etc
- Operating expenses includes administrative salary, sales commission, promotion, etc
- Working capital excludes long term investments such as shop, tools and equipment, and etc

A. PRODUCTION/SERVICE COST

- Production costs are a key component in agri-business.
- It includes all costs associated with production including value addition to make the product ready for sale.

Table 4: Template for estimating service cost for vaccination and debeaking

TYPE OF COSTS	UNIT OF MEASUREMENT	QUANTITY	UNIT COST	TOTAL COST
Vaccines	Dose			
Drugs	ml/vial/ampule			
Acaricide	Bottle/vial			
Vitamins	ml			
Ice box	Number			
Ice pack	Number			
Treatment syringes	Number			
Vaccination syringes	Number			
Gloves	Pack			
Loading and unloading	Qtl			
Transporting	Qtl			
Storage if rental/month	Birr			
Total				

B. OPERATING EXPENSES

- Operating expenses are all costs not directly associated with production.
- They are common costs incurred for administrative and selling activities.

Example administrative salary, promotion/service cost, sales commission, transport cost to sale, etc

Table 5: Template to estimate operating expenses for agri-business

TYPES OF COSTS	TOTAL COSTS
Administrative salary	
Utility (electric, water, gloves, cotton, gauze tele.)	
Interest	
Promotion	
Sales commotion	
Tax	
Etc...	

5.2. ESTIMATED SERVICE REVENUE

- The main source of revenue for the agri-business to generate profit is through providing service.
- To determine the expected service revenue for the planned service



FORMULA - 2

Total service revenue = Total no of service X unit service price

Table 6: Template for estimating volume of production and sale revenue

TYPE OF SERVICE	TOTAL SERVICE	ESTIMATED SERVICE PRICE/UNIT	TOTAL SERVICE REVENUE (BX C)
Vaccination			
Treatment			
Husbandry			
Total service revenue			

5.3. PROFIT AND LOSS STATEMENT

- The primary objective of any business is to generate profit.
- Profit and loss statement is the main tool to calculate profitability of the business.
- It is used to accept or reject the investment based on estimated profit



FORMULA - 3

- Gross profit = Total service revenue – Cost of inputs*
- Net profit = Gross profit – Total operating expenses*

Table 7: Template for profit and loss statement preparation

DESCRIPTION	INPUT COST/ EXPENSE	SERVICE INCOME
Service Revenue		
Vaccination		X
Debeaking		X
Total Service revenue		X+X
Cost of input (-)		
Vaccine, vitamins	X	
Gross profit		X
Total Operating Expenses (-)	X	
Net profit		X

5.4. BALANCE SHEET

Balance sheet used to know the total resource owned, amount of claim by creditors and amount of owners' equity

- Balance sheet contains asset, liability, and own capital
- Assets are all resources available for use or for sale
Example cash, inventory, store/shop, equipment etc
- Liabilities are all debts obtained from bank, microfinances, individuals or others
- Own equity/capital involves own/member contribution, grant/donation, etc



FORMULA - 4

$$\text{Total Asset} = \text{Total liability} + \text{Total own capital}$$

Table 8: Template for balance sheet preparation

DESCRIPTION		
Asset		
Current asset		
Cash		
Inventory		
Total current asset		
Fixed asset		
Tools and equipment		
Total fixed asset		
Total asset		
Liability and Capital		
Liability		
Bank loan		
Debt from relative		
Total liability		
Owners' capital		
Own capital contribution		
Grant/donation		
Total owners' capital		
Total liability and capital		

5.5. CASH FLOW STATEMENT

Cash flow is all cash inflow and outflow for any purpose in the business operation.

Example:

- Cash inflows include service income, debt obtained from banks, members capital contribution, etc
- Cash out flow includes purchase of input, payment for construction, repayment of debt, payment for salary, etc



FORMULA - 5

*Beginning cash balance + total cash inflow =
ending cash balance + total cash out flow*

Table 9: Template for cash flow statement preparation

DESCRIPTION	AMOUNT OF OUTFLOW	AMOUNT OF INFLOW
Owners' investment		
Debt		
Grant		
Service income		
Waste house construction cost		
Purchase of equipment		
Purchase of input		
Cash Operating costs		
Ending cash balance		
Total		

5.6. BREAK EVEN ANALYSIS

- Break even analysis is used to determine the minimum level of production to cover total cost
- At break-even point no profit no loss
- To make profit, level of production and sale should exceed/greater than breakeven point.
- Fixed costs are fixed in total amount regardless of increase/decrease in volume of production.

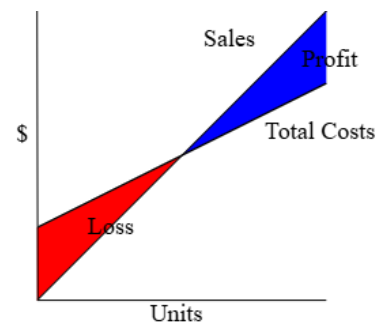
Example depreciation, shop rent, administrative salary, promotion cost, etc

- Variable costs varied in total in response to increase/decrease in level of production



FORMULA - 6

Break-even point = Fixed cost / (Unit selling price – unit Variable cost)



5.7. PAYBACK PERIOD

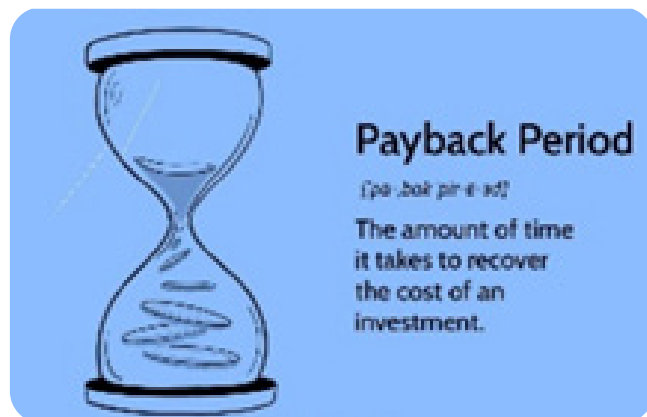
Payback period is used to determine number of years/ periods it takes to recover initial investment



FORMULA - 7

When the annual profit of the business is uniform/equal. Payback period = Initial investment/annual profit

When the annual profit fluctuate/vary from year to year. Pay back period = # of year before coverage + uncovered amount/profit of the next year



POST ASSESSMENT QUESTIONS

- Which of the following is part of working capital
 - Purchase of drugs,
 - Purchase of dehorning equipment
 - Transportation cost
 - Purchase of chemical
- Which of the following should include in profit/loss statement
 - Purchased of tools and equipment
 - Sales revenue
 - Debt
 - Owner investment
- Which of the following is variable cost
 - Purchase of vaccine
 - Administrative salary
 - Depreciation
 - Rent of storage

KEY MESSAGE

Analyzing financial feasibility of agribusiness enables to pre-determine the applicability of the business in terms of initial investment requirement, profitability, and sustainability.

POTENTIAL RISKS AND MITIGATION STRATEGIES

This section helps the youth entrepreneurs to predict the possible/unexpected challenges they may face and prepare for reversing the risks of damping their business.

Table 10: Risks and mitigation measures

NO	POTENTIAL RISKS	MITIGATION STRATEGIES
1	Vaccine and drug failure	Proper handling, storage, transportation, use and techniques. Post vaccination and treatment monitoring
2	Failure to follow vaccination schedules	Strict adherence to routine vaccination regime
3	Input price/availability instability shocks	Advance/wholesale inputs purchase arrangements, having emergency stock
4	Adverse weather shocks	Prepare facilities to overcome
5	Electric fluctuation	If possible use generator or reserve more ice packs
6	Lack of acceptance/confidence by the community	Trust building, promotion, awareness creation
7	Conflict of interest	Provide mind set trainings
8	Emerging market competitors	Diversifying the business

Annexes

Normal Physiological Values of Animals

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

RECORD KEEPING TEMPLATES

Inventory record

S.NO	LIST OF INPUTS /EQUIPMENT	UNIT OF MEASUREMENT	QUANTITY	UNIT COST	TOTAL COST	REMARK
1	Vaccines					
2	Vitamins					
3	Drugs, insecticide,					
4	Vaccination Kits, ice box					
5	Vaccine carriers, vaccine diluents					
6	Cleaning and sterilization materials (antiseptics, chemicals, detergents, Disinfectants,					
7	PPE /safety equipment (PPE, gowns, gloves, aprons, face shields, boots, goggles)					

SERVICE DELIVERY RECORD

S/NO	DATE	SPECIES	LOCATION	DELIVERED SERVICES	DIAGNOSED CASE	TREATMENT/ VACCINATION	DOSES OF DRUGS/ VACCINES	SERVICE CHARGE

Name of Service Provider _____ Signature _____

Major Animal diseases

Disease	Cause	Symptoms	Prevention & Control
NUTRITIONAL DEFECTS			
Anemia	All farm animals are susceptible. Iron deficiency prevents the formation of hemoglobin, a red iron-containing pigment in the red blood cells responsible for carrying oxygen to the cells.	Characterized by general weakness and a lack of vigor.	A balanced ration usually prevents the occurrence of anemia.
Bloat	Typically occurs when animals are grazing on highly productive pastures during the wetter part of late spring & summer.	Swollen abdomen on the left side, labored breathing, profuse salivation, groaning, lack of appetite, & stiffness.	Maintain pastures composed of 50% or more grass.
Colic	Improper feeding.	Pain, sweating, & constipation, kicking, & groaning.	Careful feeding.
Enterotoxemia	Bacteria & overeating.	Constipation is an early symptom & sometimes followed by diarrhea.	Bacterin or antitoxin vaccine should be used at the beginning of the feeding period.
Founder	Overeating of grain, or lush, highly improved pasture grasses.	Affected animals experience pain and may have fever as high as 106 degrees F.	Good management & feeding practices prevent the disease.
VIRAL DISEASES			
Cholera	Caused by a filterable virus.	Loss of appetite, high fever, reddish-purplish patchwork of coloration on the affected stomach, breathing difficulty & a wobbly gait.	A preventive vaccine is available. No effective treatment. Producers should use good management.
Equine Encephalomyelitis	Viruses classified as group A & B are transmitted by blood-sucking insects, such as the mosquito.	Fever, impaired vision, irregular gait, muscle spasms, a pendulous lower lip, walking aimlessly.	Control of carrier, use of a vaccine.
Hemorrhagic Septicemia	Caused by a bacterium that seems to multiply rapidly when animals are subject to stress conditions.	Fever, difficulty breathing, a cough, & discharge from the eyes & nose.	Vaccination several days prior to shipping or other periods of stress.
Newcastle	Poultry disease- caused by a virus that is spread by contaminated equipment or mechanical means.	Chicks make circular movements, walk backwards, fall, twist their necks so that their heads are lying on their backs, cough, sneeze, and develop high fever & diarrhea.	Several types of Newcastle vaccines are available, antibiotics are used in treating early stages of the disease.
Warts	A virus causes warts.	Protruding growths on the skin.	No known preventive measures. Most effective means is with a vaccine.

Disease	Cause	Symptoms	Prevention & Control
BACTERIAL DISEASES			
Pneumonia	Bacteria, fungi, dust, or other foreign matter. The bacterium, <i>Pasteurella multocida</i> , is often responsible for the disease.	A general dullness, falling appetite, fever & difficulty breathing.	Proper housing, ventilation, sanitation, and antibiotics.
Tetanus	A spore-forming anaerobic bacterium is the cause. The spores may be found in the soil & feces of animals.	Difficulty swallowing, stiff muscles, & muscle spasms.	Immunizing animals with a tetanus toxoid.
Atrophic Rhinitis	Two different bacteria, <i>Bordetella bronchiosptica</i> & <i>Pasteurella</i> , cause atrophic rhinitis.	Affects the nose, making it crooked and wrinkled. Sneezing, nose bleeds, and a tear-stained face occur.	Sanitation and a good health program are important for prevention. Vaccines are available.
Anthrax	A spore-forming bacterium causes the disease.	Fever, swelling in the lower body region, a bloody discharge, staggering, trembling, difficult breathing, & convulsive movements.	An annual vaccination. Manure & contaminated materials should be burned & area disinfected. Insects should be controlled.
Blackleg	(Cattle-Sheep) A spore-forming bacterium that remains in an area permanently. The germ has an incubation period of one to five days & is taken into the body from contaminated soil & water.	Lameness, followed by depression & fever. The muscles in the hip, shoulder, chest, back, & neck swell.	A preventative vaccine.
Brucellosis	Caused by bacteria. <i>Brucella abortus</i> is the bacterium.	The abortion of the immature fetus is the only sign in some animals.	Vaccinating calves with Br. abortus prevent cattle from contacting the disease. Infected cattle must be slaughtered.
Distemper	(Horses) – Contagious. Exposure to cold, wet weather, fatigue, and an infection of the respiratory tract aid in spreading the disease.	Increased respiratory rate, depression, loss of appetite & discharge of pus from the nose are visible symptoms. Infected animals have fever & swollen lymph glands, located under the jaw	Animals with disease should be isolated, provided with rest, protected from the weather, and treated with antibiotics.
Erysipelas	A resistant bacterium capable of living several months in barnyard litter.	Three forms: acute, subacute, & diamond skin form. Acute: constipation, diarrhea, & reddish patches on the skin. Subacute: usually localized in an organ such as heart, bladder, or joints. Sloughing off of the skin is common.	An anti-swine erysipelas serum is available.
Leptospirosis	Caused by a bacterium found in the blood, urine & milk of infected animals.	Causes abortion & sterility. Symptoms are blood-tinged milk & urine.	Susceptible animals should be vaccinated.
Tuberculosis	Three types of tubercle bacilli causing the disease are human, bovine, & avian. The human type rarely produces TB in lower animals, but the bovine type is capable of producing the disease in most warm-blooded vertebrates. The avian type produces the disease in birds & swine.	Lungs are affected. However, other organs may be affected. Some animals show no symptoms; others appear unthrifty & have a cough.	Maintaining a sanitary environment & comfortable quarters help prevent the disease.
Pullorum	Poultry disease caused by a bacterium that is capable of living for months in a dormant state in damp, sheltered places. The germs infect the ovary & are transmitted to the chicks through the eggs.	Infected chicks huddle together with their eyes closed, wings drooped, feathers ruffled, & have foamy droppings.	Blood test is required for positive identification of the disease. Disposal of infected hens aids in preventing the disease. Chicks should be purchased from a certified pullorum-free hatchery.

DISEASE	CAUSE	SYMPTOMS	PREVENTION & CONTROL
FUNGAL DISEASES			
Foot Rot	A fungus common to filth is responsible for foot rot. Animals are most apt to contact foot rot when forced to live in wet, muddy, unsanitary lots for long periods of time.	Skin near the hoof-line is red, swollen, & often has small lesions.	Maintaining clean, well-drained lots is an easy method of preventing foot rot.
Calf Diphtheria	Lives in soil, litter, & unclean stables & enters the body through small scratches or wounds.	Difficulty breathing, eating, and drinking. Patches of yellowish, dead tissue appear on the edges of the tongue, gums, & throat. Often, a nasal discharge occurs.	The diseased tissue is removed to expose healthy tissue, which is treated by swabbing it with tincture of iodine.
PROTOZOAN DISEASE			
Coccidiosis	A protozoan of which several species is responsible.	Occurs in two forms: cecae and intestinal. Cecae is the acute form that develops rapidly & causes high mortality rate, bloody droppings, & sudden death. Intestinal coccidiosis is chronic in nature, and its symptoms are loss of appetite, weakness, pale comb, & low production. Few deaths occur from the latter form.	Because the disease is transmitted in feces, maintaining sanitary conditions & feeding a coccidiostat prevent the disease.

