Animal Health Care Service

Level - IV

Based on March 2018, Version 3

Occupational standards

Module Title: Participate in Herd Health Management Program

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East Africa Skills for Transformation and Regional Integration (EASTRIP) Project

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LG #71	**LO #1- Identify Hazard and risks**

Instruction sheet

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

- Collecting and assessing information of hazard and risk control
- Maintaining personal hygiene and cleanliness
- Recognizing and reporting hazards in the workplace
- Recognizing and taking action on risks

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

- Collect and assess information of hazard and risk control
- Maintain personal hygiene and cleanliness
- Recognize and report hazards in the workplace
- Recognize and take action on risks

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 all information sheets.
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Information Sheet-1	Collecting and assessing information of hazard and risk control

1.1 Introduction

One of the "root causes" of workplace injuries, illnesses, and incidents is the failure to identify or recognize hazards that are present, or that could have been anticipated. A critical element of any effective safety and health program is a proactive, ongoing process to identify and assess such hazards. To identify and assess hazards, employers and workers:

- Collect and review information about the hazards present or likely to be present in the workplace.
- Conduct initial and periodic workplace inspections of the workplace to identify new or recurring hazards.
- Investigate injuries, illnesses, incidents, and close calls/near misses to determine the underlying hazards, their causes, and safety and health program shortcomings and group similar incidents and identify trends in injuries, illnesses, and hazards reported.
- Consider hazards associated with emergency or non-routine situations.
- Determine the severity and likelihood of incidents that could result for each hazard identified, and use this information to prioritize corrective actions.

1.2 Collect information about workplace hazards

Collect information on current herd health status and production: Collecting and considering the information about a herd's current health status and owner's concerns is optional, but it is highly recommended for the following reasons:

- It will enhance the veterinarian's understanding of the operation.
- It provides the veterinarian an opportunity to remark on the potential impact of subclinical and clinical disease infections on the incidence of other herd diseases (e.g., metritis, foot rot, etc.).
- When drafting the disease management plan, information collected in this step offers the veterinarian an opportunity to tie certain management practices,

directed at controlling or preventing disease, back to address some of the owner concerns and existing practices.

- Current herd health information is important to consider before writing the herd plan because some of the herd's performance limiting health issues may be principal to the sustainability of the business.

Collect history, owner goals and biosecurity data and estimate disease prevalence: This allows you to collect basic information about the herd inventory and biosecurity practices. It encourages the producer to articulate major goals for their operation, such as changes in herd size or facilities, management, environmental issues, product quality, etc. Goals dictate what is important to the owner and influence future commitment to any management plan. Biosecurity questions may reveal practices that can be addressed in the final plan to maintain or enhance herd protection from disease.

Assess risks for transmitting disease among specific animal groups: This step should be completed for the Management and Herd Testing Elements. This is a basic requirement for the management and herd testing elements of the Program. The object is to conduct an assessment of the management practices or conditions that promote the risk for spread of disease and other fecal-oral and colostrum-milk transmitted pathogens.

Information about the herd's history with and potential exposure to disease should be collected. This data could provide useful benchmarks from which to consider the potential impact of disease on business profitability and to evaluate changes and progress over time. The quality of the information available can range from accurate written records to personal recall.

Information on workplace hazards may already be available to employers and workers, from both internal and external sources. Collect, organize, and review information with workers to determine what types of hazards may be present and which workers may be exposed or potentially exposed.

1.3 Assessing and controlling risks

Assess and understand the hazards identified and the types of incidents that could result from worker exposure to those hazards can be used to develop interim controls and to prioritize hazards for permanent control. Risk assessment is a term used to describe the overall process or methods where you:

- Identify hazards and risk factors that have the potential to cause harm
- Analyze and evaluate the risk associated with that hazard
- Determine appropriate ways to eliminate the hazards, or control the risks when the hazard cannot be eliminated.

Occupational recognize that engineering, work practice and administrative controls are the primary means of reducing employee exposure to occupational hazards.

Engineering controls: these minimize employee exposure by either reducing or removing the hazards at the source or isolating the worker from hazards. They include:

- Eliminating toxic chemicals and substituting non-toxic chemicals
- Enclosing work processes or confining work operations
- Installing general and local ventilation

Work practice controls: These alter the manner in which a task is performed. Some fundamental and easily implemented work practice controls include:

- Changing existing work practices to follow proper procedures that that minimize exposures while operating production and control equipment
- Inspecting and maintaining process and control equipment on a regular basis
- Implementing good housekeeping procedures and providing good supervision
- Prohibiting eating, drinking, smoking, chewing tobacco and applying cosmetics in regulated areas

Administrative controls: When effective work practices or engineering control are not feasible or while such controls are being instituted, appropriate personnel protective equipment must be used, e.g. gloves, goggles, helments, safety shoes, protective clothing and respirators. To be effective PPE must be individually selected, properly fitted and properly worn.

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: choose the best answer (4 point)

1. One of the following is information regarding to hazards should be available in the workplace
   A. Equipment and machinery operating manuals.
   B. Safety Data Sheets (SDS) provided by chemical manufacturers.
   C. Patterns of frequently-occurring injuries and illnesses
   D. All

Test II: Short Answer Questions

1. _____is the process of deciding upon and implementing measures to address the risks identified in the risk assessment (4 point)
2. Describe the three steps of collecting information regarding to hazard in herd (4 points)

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

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

Information Sheet-2	Maintaining personal hygiene and cleanliness

2.1 Personal protective equipment

Personal protective equipment (PPE) is equipment that will protect the user against health or safety risks at work. Relying on PPE will not reduce the risk of an incident, but can reduce the severity of an injury. For example, wearing a helmet could reduce the severity of a head injury to a quad bike rider, but it does not prevent an incident from happening. Sometimes PPE is mandatory. For example, respiratory protection is mandatory for asbestos removal and spray painting. If possible, first try to eliminate or remove a hazard completely. If this is not possible, consider substituting or replacing the hazard with a less hazardous work practice. You could also try to isolate the hazard, or implement engineering controls which provide long-term solutions (e.g. a noise baffle on a piece of equipment). This approach is often cheaper and more effective than continually providing, replacing, maintaining and storing PPE. Remember too that control measures at the source protect all workers in the area, while PPE only protects the individual wearer.

Provide workers with suitable information, instruction and training in the safe and correct use of PPE. Make sure that PPE:

- is effective and gives adequate protection against the hazard (e.g. for handling a pesticide, do the gloves resist penetration?)
- is of an appropriate standard
- is readily available for use
- matches the wearer, the task and the working environment, so that it does not get in the way of the job being done or cause any discomfort and checked before use and cleaned, maintained in good condition and stored

Basic PPE kit to have on hand: disposable P2 respirators for grain handling, goggles for chemical handling, long gloves for chemical handling, face shield, gauntlet gloves and apron for welding, standard safety glasses for various tasks, coveralls, eye protection,

steel capped footwear, gloves, safety helmets, wet weather clothing, hearing protection, masks and etc.

2.2 Maintaining personal hygiene practices

- Set high standards for personnel cleanliness and hygiene
- Require suitable clothing, gloves, masks, head covers, coats, coveralls, shoe covers, etc.
- Require hand-washing and changing clothes where necessary
- Affix biohazard signs on doors around clinic where biohazardous material is handled or stored.
- Keep the facility clean and free of clutter. Make certain that emergency safety devices (fire extinguishers, eye washes, etc.) are easily accessible and in working order
- Make certain that all personnel, students and visitors wear protective clothing such as lab coats, gloves and safety glasses. Remove lab coats or gowns before leaving the laboratory , clinic or facility
- Use hypodermic needles only when absolutely necessary. Do not bend, break, shear or recap used needles. Use the appropriate sharps containers
- Use a two-person team to inoculate animals when appropriate
- Wash hands after handling infectious material and before leaving the laboratory and clinic
- Decontaminate all contaminated materials before disposal or reuse
- Decontaminate clinic and laboratory surfaces following any spill of biohazardous materials and at the end of each workday.
- Report all spills, accidents, and incidents immediately.

2.3 Sanitation and cleaning

Sanitation addresses the cleaning and disinfection when necessary of people, equipment, animals and material entering a farm. Routine farm operations such as feeding, milking, animal handling, medical treatments, contact with vehicles and equipment, interactions with service providers and outside visitors, are all possible contact points for the transfer of diseases and pests. Entry and exit routes from

buildings and a property have the potential to bring and take away disease-causing organisms.

Some form of cleaning and disinfection should be done before people and their clothing, equipment, supplies, and larger items such as vehicles and heavy equipment cross from dirty or low risk (the farm perimeter) to clean or higher risk areas (animal housing, animal transport vehicles, feed, water and other items that come into close contact with livestock).

Establish a controlled access zone, which is a transitional space with reduced contamination between the farm perimeter and where livestock are housed. A farm may want to require that all organic material be cleaned from boots, clothing, equipment and vehicles before entering this area. Personnel may be required to shower and wear clean outerwear prior to arrival, or clean and disinfect footwear and wear site-specific outerwear prior to entering the buffer area. A Line of Separation dividing dirty from clean may serve as a convenient location to reduce, remove, inactivate, eliminate, or destroy disease-causing organisms prior to crossing into livestock areas.

Basic cleaning and disinfection considerations

Sanitation practices of cleaning and disinfection are intended to stop the transmission of infectious agents. It involves inactivating or destroying disease-causing microorganisms on the farm premises, equipment, vehicles and personnel.

Cleaning: removes germs, dirt and impurities from surfaces or objects. Cleaning works by using soap (or detergent) and water to physically remove germs from surfaces. This process does not necessarily kill germs, but by removing them, it lowers their numbers and the risk of spreading infection. Areas that are determined to be a low risk for disease transmission may only require cleaning.

Sanitizing: lowers the number of germs on surfaces or objects to a safe level, depending on the requirements. This process works by either cleaning or disinfecting surfaces or objects to lower the risk of spreading infection.

Disinfecting: kills germs on surfaces or objects. Disinfecting works by using physical or chemical agents to kill germs on surfaces or objects. This process does not necessarily clean dirty surfaces or remove germs, but by killing germs on a surface after cleaning, it can further lower the risk of spreading infection.

Sterilization: kills all forms of microbial life. Steam under pressure, dry heat and liquid chemicals are used in this process.

The life span of infectious agents/disease-causing microorganisms varies. Many viruses and bacteria have short life spans outside of a host, from hours to days. However, others can live a long time with the right environmental conditions for them (anthrax, foot and mouth disease). Removing organic material such as dirt, feed and manure is the first step in the sanitation process, no matter if you are cleaning boots, floors, buckets, water troughs, equipment or vehicles. The general order for the sanitation process is: dry clean (remove solids), wet wash, rinse, dry and disinfect.

Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Say True or False (4 point)

1. Cleaning refers to removes germs, dirt and impurities from surfaces or objects
2. The general order for the sanitation process is dry clean (remove solids), wet wash, dry and disinfect and rinse.
3. Sanitation may involves inactivating or destroying disease-causing microorganisms on the farm premises

Test II: Short Answer Questions

1. List personal protective equipment used in herds managements (4 points)
2. Describe the general order of sanitation process (4 points)

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

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

Information Sheet-3	Recognizing and reporting hazards in the workplace

3.1 Introduction

Inspection of the work place is the best source of directly relevant data about health hazards. There is no substitute for observation of work practices, use of chemical and physical agents, and the apparent effectiveness of control measures. You can reduce the risk of farm injuries and illness at your farm by evaluating the risks and minimizing them. Accidents can be prevented through better farmer and worker education, making sure equipment is well maintained and has adequate safety features, having safety procedures in place, and training every worker and family member about potential dangers.

3.2 Potential hazards

Every farm is different, but hazards common to most farms include:

Animals: injuries inflicted by animals can include bites, kicks, crushing, ramming, trampling, and transmission of certain infectious diseases such as giardia, salmonella, ringworm and leptospirosis

Chemicals: pesticides and herbicides can cause injuries such as burns, respiratory illness or poisoning

Confined spaces: such as silos, water tanks, milk vats and manure pits may contain unsafe atmospheres, which can cause poisoning or suffocation

Electricity: dangers include faulty switches, cords, machinery or overhead power lines

Heights: falls from ladders, rooftops, silos and windmills are a major cause of injury

Machinery: hazards include tractors without roll-over protection structures, power take-off shafts, chainsaws, augers, motorbikes and machinery with unguarded moving parts

Noise pollution: noise from livestock, machinery and guns can affect your hearing

Vehicles: crashes or falls from motorbikes, two-wheel and quad bikes, tractors, utes and horses can result in major injuries

Water: drowning can occur in as little as five centimeters of water. Dams, lakes, ponds, rivers, channels, tanks, drums and creeks are all hazards. Young children are particularly at risk

Weather: hazards include sunburn, heat stroke, dehydration and hypothermia.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choice best answer (3 point each)

1. One is animal related hazard

   A. Bites C. Crushing

   B. Kicks D. Poisoning

Test II: Short Answer Questions

1. List the different hazards in the farm animals (7 points)

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

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

Information Sheet-4	Recognizing and taking action on risks

4.1 Introduction

Those hazards assessed as being high risk and of an on-going nature (e.g. hazardous substances) will be documented in the Risk Register. The control measures to be applied to reduce the level of risk to an acceptable level (medium or low) will also be documented in the Risk Register. Decisions on the appropriate control measures to be applied will be based on the following considerations:

- Can the risk be eliminated (e.g. mustering steep country by foot instead of bike)
- If the risk can't be eliminated, can it be minimized
- Risks may be minimized using Safe Work Procedures which describe how a task is to be done as safely as possible e.g. operating a tractor

4.2 Risk to self, standers, public and animals and taking action on risk

Animal risk: Farmers and farm workers can easily be injured by livestock. Cattle, pigs, horses, sheep and other farm animals can be unpredictable and should be treated with caution at all times. Attempting to lift or push animals can cause injury and animals may also transmit certain diseases. Understanding cow behavior is vital to maintaining dairy farm safety. Livestock can be quite unpredictable, though gentle handling of both cows and heifers can help reduce kickers and result in a more productive and relaxed herd. Plan ahead for any task, maintain a barrier between the animals and yourself, and get help if you need it. To prevent farm accidents, assess the breed, temperament, gender mix, size and training of your animals. Remember that both male and female animals may be more aggressive during the mating season. Always wear suitable protective clothing (pants, boots) and use appropriate animal-handling facilities and aids such as cradles and crushes.

Zoonoses: infectious diseases that are able to spread from animals to man. Recently many emerging and re-emerging infectious diseases of humans have originated from animals. Some infectious animal diseases, such as foot-and-mouth disease, classical swine fever, African swine fever, and avian influenza, have serious consequences for

animal health, as well as considerable negative economic impact, and are therefore controlled under national and international regulations. Often these diseases are controlled by the large-scale culling of infected animals and the massive pre-emptive culling of animals at risk of spreading the disease.

Chemical hazardous risks: Once the potential risks associated with hazardous chemicals have been identified, the risk must be assessed. Assessing risk allows you to evaluate what would happen if someone was exposed to hazardous chemicals. A risk assessment will allow you to calculate the magnitude of the risk by determining the severity and likelihood of an incident occurring. Once you have identified and assessed the severity of the risks, you will have valuable data that will allow you to determine the best methods that should be used to control the risk. Once the controls have been implemented, you must review their effectiveness and set up a proactive system to sustain their effectiveness. This proactive system normally consists of a number of periodically scheduled risks assessments.

Managing the risks associated with hazardous chemicals has four distinct phases.

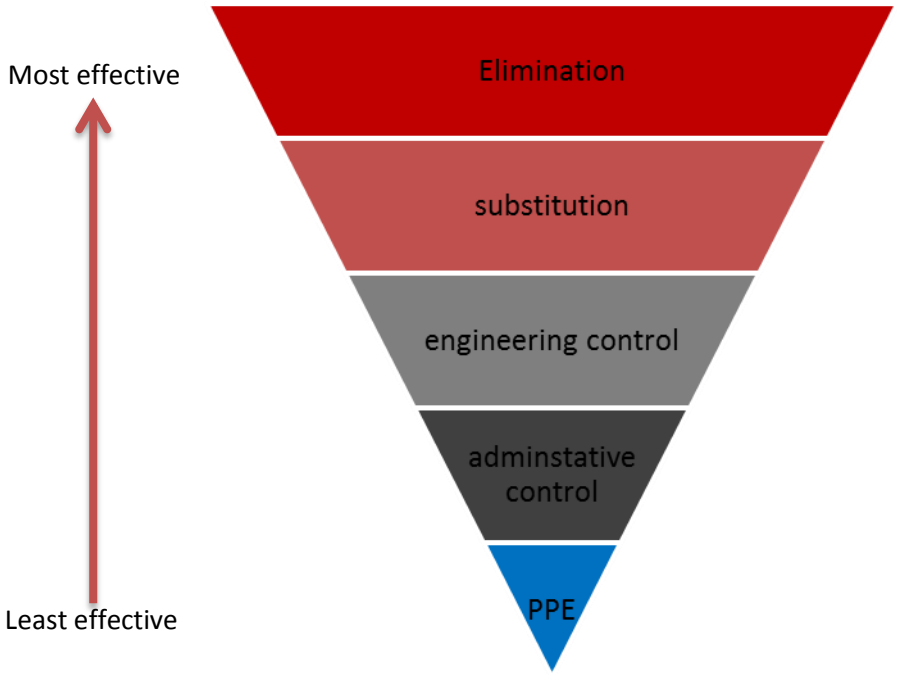

Fig. 1: Hierarch of risks control

Elimination: The risk control measure that has the greatest level of effectiveness is elimination. Before any other control measures are considered, elimination must be applied first. Elimination is the method of totally removing a hazard or hazardous practice from the workplace. Some examples of eliminating the use of a hazardous chemical in the workplace include:

- Eliminating the use of chemical adhesive by using fasteners such as screws or nails.
- Eliminating the use of flammable forklift gas by using electric power forklifts instead of LPG powered forklifts.

Substitution: If you can't totally eliminate the use of a hazardous chemical you must then try to substitute it. Substitution is when you replace the use of a hazardous chemical with another chemical that is less hazardous and presents a lower level of risk.

Isolation: If it's not possible to substitute the use of a hazardous chemical with another chemical that is less hazardous, you must then isolate the hazardous chemical from people and other incompatible substances. This can be done in a number of ways. For example; if one part of a manufacturing process involves the use of a hazardous chemical, you could build a ventilated enclosure over this part of the manufacturing process. This enclosure would stop the airborne contaminants from this area moving into other areas of the manufacturing facility where people are present. The airborne contaminants that are generated inside this enclosure should be vented to the outside atmosphere in a safe location where people don't congregate.

Engineering Controls: If isolation cannot be achieved, you can implement a number of engineering controls to reduce the risk associated with hazardous chemicals. Engineering controls are physical in nature and are devices or processes that eliminate exposure to hazardous chemicals. Engineering controls can be used to:

- Minimize the generation of hazardous chemicals
- Suppress or contain chemicals
- Limit the area of contamination in the event of spills

Administrative Controls: If a risk still remains after implementing higher order controls, they must be reduced by implementing administrative controls. Administrative controls are not as effective because they don't control the hazard at its source. Administrative controls rely on human behavior and supervision. Administrative controls are written policies and procedures that outline the best work practices to minimize exposure to hazardous chemicals. These policies can include things such as:

- Reducing the number of people exposed to hazardous chemicals
- Reducing the duration and frequency of exposure to hazardous chemicals
- Reducing the quantity of hazardous chemicals kept on site through inventory reduction methods such as just in time supply.

Self-check 4	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (3 points for each)

1. _____is refers to replace the use of a hazardous chemical with another chemical that is less hazardous and presents a lower level of risk.
   A. Elimination
   B. Substitution
   C. Engineering control
   D. Administrative control
2. _____ is risk control measure that has the greatest level of effectiveness is elimination.
   A. Elimination
   B. Substitution
   C. Engineering control
   D. Isolation

Test II: Short Answer Questions

1. List the risks from herds on animal respondent and its control measures (4 points)

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

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

Operation Sheet: Cleaning of dairy farm

Objective: Cleaning dairy farms

Materials: (shovel, mop, bucket, brush, disinfectant, glove, PPE, water, garbage container)

Procedure:

1) Remove contamination and dry material such as sharp material, manure, soil, bedding, feed, etc.
2) By using water and detergents wash thoroughly the room
3) Rinsing with cold and pure water
4) Dry surface by using mop and drying material
5) Disinfect the surface by disinfectants (to remove biological hazards)

LAP TEST	Performance test

Name_____ ID_____ Date _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2 hour. The project is expected from each student to do it.

During your work: You can ask all the necessary tools and equipment

Lap Test Title: Procedure for cleaning of dairy farm

Task. Perform cleaning of dairy farm

LG #72	LO #2- Participate in the Planning of herd health programs

Instruction sheet

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

- Developing the herd health management program for the animal farms
- Identifying farm production goals
- Identifying herd health hazards and risks for the individual farms
- Identifying and assessing the critical areas of health abnormalities in the production cycle of farm animals
- Identifying basic animal care and handling activities
- Selecting and planning disease prevention and controlling methods and programs

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

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Information Sheet-1	Developing the herd health management program for the animal farms

1.1 Definition

Herd health is a combination of regularly scheduled veterinary activities and good herd management designed to achieve and maintain optimum animal health and production. The primary objectives of a health and production management program for herds of food producing animals are:

- Maintenance of animal health and production at the most efficient level that provides competitive economic returns to the animal owner. The ever present goal is to control and manage animal health and production at a high level of efficiency while seeking and introducing new techniques that can continue to improve efficiency.
- Provision of comfortable animal facilities and housing commensurate with reasonable animal welfare. Good animal production and animal welfare are complementary veterinary concerns.
- Minimization of pollution of environment by animal wastes, the prevention of zoonoses and the avoidance of contaminants and residues in animal products are all important considerations.

1.2 Developing the herd health management program for dairy farms

Herd health management is a method to optimize health, welfare and production in a population of dairy cows, through the systematic analysis of relevant data and through regular objective observations of the cows and their environment Industrialization of animal farming and increasing international market competition has led to selective breeding of high producing cows and consequence of this development, however, was higher susceptibility to disease. As a result of this, attention shifted from curing single animals to prevention of disease on herd level. Bio-security is a program used to prevent the introduction pathogens from external sources on farms, as well as the spread of such diseases once they have entered the farm. The monitoring is an essential part of programs to achieve and maintain a good udder health on dairy farms in the long term. It is necessary for routine evaluations of the herd health and

performance status, the continuous verification of the effectiveness of actions taken to improve the herd status and, the early identification of emerging problems.

Nutritional Management

In most dairy herds, nutritional management is the most important determinants of herd productivity. Feed costs account for the largest proportion of variable cost for most dairies. Many common production limiting diseases of adult dairy cattle are caused at least in part errors in nutritional management. The relationship between nutrition and productivity begins at birth. Dairy herds that reported mean age at first calving of less than 27 months and mean body weights at first calving of more than 545 kg have been shown to have higher mean of milk production. The dairy feeding system must be designed to deliver necessary nutrients to each cow at the correct stage of lactation to maintain optimum productivity. The choice of a feeding system is associated with both herd size and production level.

Three general types of feeding systems are used currently by dairy farmers:

- Total mixed rations (TMTs)
- Component feeding
- Management intensive grazing (MIG)

The use of TMR feeding systems has increased as more herds have adopted free stall or dry lot housing facilities. TMR diets have several advantages: cows consume the desired proportion of forages, reduced risk of digestive upset, increased feed efficiency, ability to use by product feeds, greater accuracy in diet formulation and reduced labor needs. Component-fed herds receive grain and forage separately. Farms using these systems are often housed in tie-stall facilities. Pasture based forage systems are used in many dairy regions of the world. Management intensive grazing systems can be used to meet the needs of modern dairy cows. In pastoral systems, nutrition is often the most limiting factors for achievement of optimum productivity.

Reproductive Management

In most dairy herds, reproductive management is a key determinant of oveall productivity. The reproductive program is the most common reason for scheduled herd

visits by dairy veterinarians and is a recognized area of expertise. The dairy herd veterinarian can improve herd productivity significantly by designing and implementing sound reproductive management programs that include cost effective strategies to meet farm goal. Reproductive disorders are the most common and costly reason for premature culling of dairy cows. Reproductive management can influence productivity through the following:

- Production loss
- Low producing stage of lactations
- Reduce genetic potential
- Reproductive inefficiency
- Excessive labor and costs of treatments

In his herds veterinarians need to include breeding soundness exams and bull management programs in health management programs to ensure continued herd productivity.

Age

The age of dairy cattle influences herd productivity. It is reasonable for the manager of a herd group's within a herd is related to the risk of acquiring a number of disease syndromes. Mastitis and reproductive inefficiency are more prevalent in older age groups. Some diseases such as milk fever are uncommon in first lactation animals. The production medicine veterinarian should take into account the proportion of animals that are at risk for disease when setting appropriate targets of herd performance. In many confinement operations, grouping younger, first lactation animals separately from older animals has been shown to increase feed intake and improve productivity.

Disease incidence

There are a number of ways that disease can reduce herd productivity. Increased culling, reduced milk, increased adult cow mortality, and reduced reproductive efficiency are all potential outcomes of diseases of dairy cattle. Historically most veterinary attention was directed toward diseases which obvious clinical symptoms. Metabolic diseases such as milk fever and displaced abomasums, infectious diseases such as bovine viral diarrhea, and clinical mastitis were common problems for dairy farmers.

Through advances in animal husbandry and health management programs, man farms have minimized clinical syndromes associated with infectious and metabolic diseases.

Others health and management choices are:

- Replacement managements
- Herd size and composition of herd
- Stage of lactation
- Drying off and dry cow management
- Culling program, etc.

1.3 Developing the herd health management program for beef farms

Sound herd health is vital for competitive beef production. In order to create an effective herd health plan, the producer collaborates with a veterinarian to develop strategic vaccination and parasite control protocols. The veterinarian oversees the health of the herd via vaccinations, diagnostic tests, therapeutic treatments and necropsies. The veterinarian also trains the producer to properly perform procedures that do not require the services of a veterinarian. Cattle producers should be equipped with the proper facilities to handle and restrain cattle for treatment. Proper working chutes and head gates can save a producer much time and labor as well as prevent injury to the cattle.

Suggested Herd Health Practices

Breeding Herd (Cows, Bulls, Replacement Heifers)

- Fertility test bulls prior to the breeding season.
- Vaccinate for IBR-BVD-PI_3, Leptospirosis and Campylobacter (Vibriosis) 30 days prior to breeding season and while females are open (not pregnant). Follow your veterinarian's recommendation.
- Treat for internal parasites on a routine basis. Timely administration of dewormers will result in better control of internal parasites.
- Practice good external parasite control procedures; treat for flies and lice by following the veterinarian's recommendation on effective products available. Manage pastures to keep external parasites to a minimum.

- Examine all females for pregnancy after the conclusion of the breeding season and cull open cows.
- Isolate all new additions to the herd.

Calving Time

- Observe cows closely at calving time.
- Remember, a clean pasture is probably the best calving area.
- Keep animals due to calve soon in an area where handling facilities are available.
- Have your veterinarian instruct you on how to handle maternity cases. Know what equipment and medication is needed and when you should seek professional help.

Calves

- Dip the navel cords on all newborn calves with a disinfectant such as iodine or chlorhexidine.
- Make sure calves nurse and get colostrum (cow's first milk) within one hour after birth. Keep frozen colostrum or commercial powdered colostrum on hand for emergencies. Have an esophageal tube available for use on weak calves.
- Identify calves with a uniquely numbered ear tag soon after birth.
- Castrate and dehorn calves at an early age. It is easier, causes less pain and allows fewer problems when done early.
- Vaccinate all calves with Blackleg 7way and IBR-BVD-PI_3 at 60-90 days of age.
- Have an accredited veterinarian vaccinate all replacement heifers between 4-12 months of age for brucellosis.
- Treat for internal parasites on a routine basis.
- For eye problems, after the veterinarian gives a diagnosis, follow the veterinarian's advice as to treatment and preventative measures. Provide good fly control and observe closely to reduce losses. Vaccines are also available to aid in the prevention of pinkeye.

Other herd health practices

- Provide good basic nutrition.
  - ✓ Have forage tested for nutritional value.
  - ✓ Provide adequate salt and a balanced mineral supplement.
  - ✓ Supply vitamins A and D through the feed.
- Keep feet trimmed and corns removed from animals, especially bulls. Get this work done several weeks before breeding season.
- When administering injections, be sure to follow instructions. Give vaccines subcutaneously and only give vaccines in the neck region in front of the shoulder.

1.4 Developing the herd health management program for poultry farms

Infectious diseases are major problems that may be introduced easily into the flock through contaminated materials and sick birds. This is the main reason why poultry producers should not buy chickens from live bird markets or from uncertified or unknown sources, especially during outbreaks of disease. When birds are purchased or gifted from an outside source, it is important to place them in quarantine for two weeks in a room/shed or cage, so that they do not mix with the host flock, and to observe the new birds for any signs of sickness. The same structure can be used for the isolation of sick birds if quarantined chicks are not occupying it. Ensure that the structure is appropriately disinfected after use, and take appropriate hygiene measures whilst birds are in quarantine. This includes washing hands after the handling sick and quarantined birds, and always finishing the performance of routine tasks with the healthy flock, such as feeding or cleaning, before treating those in quarantine.

Vaccination is one means to prevent disease in the flock. Vaccinating the whole flock against economically important diseases, such as Newcastle disease (ND), fowl typhoid and fowl pox, helps prevent mortality in the scavenging system. Although vaccinating village chickens is not a common practice in Ethiopia, vaccines for the diseases mentioned above are produced locally at the National Veterinary Institute (NVI). Vaccination for ND is practiced in the form of campaigns by the Ministry of Agriculture in a sporadic manner in some areas of the country. This is mainly carried out when there is an outbreak in an area or suspicion of disease in the coming season. However, lack

of awareness, poor animal health services and farmers' poor perception of vaccine efficacy are among the major factors affecting implementation of vaccination programs.

In serious disease conditions poultry farmers should isolate or kill the affected birds(s) and consult the veterinarian, development agents (DAs) and other experts in the locality. After appropriate investigation, the farmer should give drugs or/and implement any management measures recommended by the veterinarian. Dead birds (or parts from dead birds) should be burned or buried deep enough (about one meter) to prevent dogs and other animals from digging them up and spread the disease. If there are many sick animals, the cause of the disease must be established before introducing new birds or vaccinating surviving chickens, to ensure that appropriate measures are put in place to reduce the chance of further outbreaks.

In addition to the measures mentioned above, farmers should refrain from traditional practices that increase the spread of disease within and beyond the village. Examples of poor practice which may lead to spread of disease include selling of birds, including the sick ones, whenever there is suspicion of disease in the flock; disposal of dead birds in communal village areas or water sources, or the feeding of carcasses to pet animals, such as dogs and cats; and failure to regularly, if at all, clean chicken shelters.

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (2 points)

1. One of the following is determinants of herd productivity dairy farm
   A. nutritional management
   B. Reproductive Management
   C. Disease incidence
   D. Herd size and composition of herd
   E. All

Test II: Short Answer Questions

1. What is herd health? (2 Points)
2. List the objectives of herd health managements (3 points)
3. List the way of reproductive management influence productivity in dairy farm (3 points)

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

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

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

Information Sheet-2	Identifying farm production goals

2.1 Introduction

A production goal should represent that volume of production which comes nearest to satisfying food requirements and yet which is capable of achievement by farmers. It is a quantity which represents a compromise between prospective demand and feasible supply. It is achieved by actively work on a target of performance. A target of performance is the level of animal health and production considered to be optimum and to yield the best economic returns on investments. Targets of performance are determined from the performance found on a sample of farms considered to representative of the economically conscious commercial farm population.

The actual levels of animal health and production are determined on a continual basis and compared with the targets of performance. The differences between the targets of performance and actual performance are the shortfalls in performance. The reasons for failure to achieve the targets of performance are then identified. Recommendations for improvement are made and performance is monitored continuously to assess the effectiveness of the action taken.

2.2 Identifying production goal for dairy farm

Age at first calving (AFC**):** the period that a female calf needs to reach puberty and to reproduce for the first time, is an important factor in the cost of rearing replacements in dairy herds. It has been reported that the optimum AFC for Holstein dairy heifers is 23 to 24 months. The length of rearing period has a direct effect on the total cost of heifer rearing; therefore, controlling AFC can be used as a management factor to reduce rearing costs. Heifers that conceive earlier and give birth at a younger age are also more fertile in later stages and may have shorter CI length. Decreasing AFC is also associated with a shorter generation interval and subsequently higher genetic progress; however, calving too early may be associated with an increased risk of dystocia, reduction in milk yield, milk components and reproductive performance. Increasing AFC, on the other hand, has been reported to be associated with higher milk, and protein yield, as well as a lower risk of dystocia in the first lactation.

Body weight calves at birth: The average weight of Jersey calves in the herd studied was 57 pounds, of Guernsey calves 64 pounds, of Ayrshire calves 72 pounds, and of Holstein calves 91 pounds. Immature cows produced smaller calves than mature cows. The nutrition of the dam had but little influence on the weight of the calf except in the case of cows on a restricted diet. In the case studied the dams on a restricted diet produced calves heavier in proportion than did well fed dams.

Average daily milk yield: Whereas a beef-sucker cow would naturally produce around 4 liters of milk per day, a dairy cow will produce an average of 28 liters per day over a period of 10 months. During peak lactation, a high-yielding cow may produce as much as 60 liters per day and up to 12,000 liters over her whole lactation.

Conception rate: Conception at the first service after calving is key to optimal reproductive performance in dairy cows, the report indicated although the percentage success of first service has been shown to range between 26.7% and 50.7%. A failure of first service conception (FSC) may lead to an increase in the number of days open, insemination numbers, reproductive treatment, feeding, culling, and replacement heifers. Thus, the identification of factors that potentially limit the success of FSC, including biological and environmental conditions, might be useful to improve reproductive performance in dairy cows.

Calving interval: The term "calving interval" refers to the period from one calving to the next calving. In dairy practice the most common calving interval is in the neighborhood of one year. Two somewhat different considerations may be responsible for this practice. There may be an economic advantage in having the flush of milk production, associated with calving, occur at some particular time of the year. There may be a biological advantage in having reproduction occur with a certain frequency.

2.3 Identifying production goal for beef farm

The goal of beef cattle production is to provide highly desirable beef for consumption in the most efficient manner. Knowledge of breeding, feeding, management, disease

control and the beef market is fundamental to the economical production of desirable beef.

Daily weight gain: To start with, at least a minimum average daily gain of 2 pounds per day should be expected and certainly achieved during the normal growing season for calves and yearlings. In reality, 2.25 to 2.5 pounds per day during the entire forage-growing season may be a reachable goal.

Body weight at birth: The birth weight of Belgian Blue calf ranged between 35 and 65 kg, with average of 49.2 kg. Birth weight was affected by weight of dams. The birth weight of Friesian Holstein calves was estimated between 40-45 kg influenced by sex of calves, age, and parity of dams. Birth weight is the major contributor to dystocia in cattle. Therefore, collecting and analyzing birth weight information is useful for many beef breeding programs. Birth weights should be collected within 48 hours of birth. Data that should be collected at birth include: Dam ID; Calf ID; birth date; birth weight; date of weighing and calving ease score. The calf should be dry and should be allowed to nurse the cow.

2.4 Identifying production goal for poultry farm

Egg production: Egg production performance of exotic chicken in our country is better than local chicken but not at its satisfactory level. The egg production potential of local chicken is 30-60 eggs/year/hen with an average of 38g egg weight under village management conditions, while exotic breeds produce around 250 eggs per year/ hen with around 60g egg weight in Ethiopia. Evidences indicate that all the imported breeds of chickens performed well under the intensive management system. In general, poultry egg and meat production is the most environmentally efficient animal protein production system. Therefore, feed shortage, disease and other critical gaps need to be filled by research institutions and development agencies to improve the productive performance of exotic chicken breeds in Ethiopia.

Meat production: The meat production ability and growth performance of indigenous chicken are limited and Local males may reach 1.5kg live weight at 6 months of age and females about 30% less. Modern commercial broilers are specially bred for large scale,

hens or traditional dual purpose breeds. They are noted for having very fast growth rates, a high feed conversion ratio, and low levels of activity. Broilers often reach a harvest weight of free-range and organic strains reach slaughter weight at 12-16 weeks of age. Typical broilers have white feathers and yellowish skin. This cross is also favorable for meat production because it lacks the typical “hair” which many breeds have that necessitates singeing after plucking. Both male and female broilers are slaughtered for their meat. Babcock is chicken breed that is currently imported in Ethiopia and used for fattening purpose.

Egg quality: Egg quality is a general term that relates to various standards that are imposed on the eggs. These standards can be broken down into those used for determining the quality of the egg shell itself (exterior egg quality) and those standards which relate to the quality of the interior of the egg (interior egg quality). Some of these standards are based on subjective measures of egg quality and some are based on a more quantitative measure of egg quality. In general, exterior and interior egg quality standards are based on shell cleanliness, shell soundness, shell texture, shell shape, relative viscosity of the albumen, freedom from foreign matter in the albumen, shape and firmness of the yolk, and freedom from yolk defects. In order to classify eggs into the various grades used, an evaluation of all these items needs to be done.

There are many factors that affect the overall quality of the egg shell, but before discussing these factors, it is important to know what makes up the structure of the egg shell. The egg shell consists of about 94 to 97% calcium carbonate. The other three to six percent is organic matter and egg shell pigment. The outer coating of the shell itself consists of a mucous coating called the cuticle or bloom which is deposited on the shell just prior to lay. This protein like covering helps protect the interior contents of the egg from bacteria penetration through the shell. Egg shell quality is determined by the color, shape, and structure of the shell. Colors can range from white to tints to brown and egg shape can also vary. Numerous factors affect the general functional quality of the egg shell. These factors affect the quality of the shell mostly prior to when the egg is laid. The thickness of an egg shell is determined by the amount of time it spends in the shell gland (uterus) and the rate of calcium deposition during egg shell formation. If the egg

spends a short period of time in the shell gland, then shell thickness will be less. Also, the time of day when the egg is laid will also determine the thickness of the shell. In general, the earlier in the day or light portion of the photoperiod the thicker the shell will be. The amount or rate of calcium deposition will also affect the thickness of the shell.

Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. List some production goal of dairy farm (4 points)
2. The average weight gain of beef cattle is _____pound (2 points)
3. List the factors which affect egg quality (4 points)

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

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

Information Sheet-3	Identifying herd health hazards and risks for the individual farms

1.1 Introduction

People working in farm dairies are exposed to hazards involving machinery and moving parts, animals, slips, trips, falls, exoskeletal injuries, electrical and chemical hazards, and burns from hot water. In general every farm is unique but all have hazards associated with cattle handling, manure storage, and machinery and equipment.

1.2 Identifying herd health hazard and risks for dairy and beef farm

Animal Handling: Activities include moving cattle around the farm, feeding and milking cows, and cleaning stalls and beds. Key hazard for these activities: Cows get stressed and can strike, pin or step on workers. Some prevention solutions are:

- Identify and eliminate (or minimize) as many stressors as feasible. These can vary based on the handling activity, physical surroundings, tameness of the individual cow and other variables.
- Avoid the blind spot; approach slowly so cows can see you and speak calmly. Fresh cows may have a larger flight zone.
- Instead of using prods or touching cows to get them to move forward, backwards or around, learn how to use the “point of balance” technique. See illustration.
- Tell workers about how they can get hurt, what causes stress for cows (e.g. startling noises, sudden contact, etc.) and how to recognize signs of stress. Demonstrate what workers can do to minimize stressors that can make cows nervous and unpredictable.

  Be aware of gates and other escape routes available; wear crush-resistant footwear (steel-toed boots).

Manure Storage: Locations include liquid manure and slurry storage pits, ponds, lagoons or tanks. Key hazards for these locations:

- Driving a farm vehicle too close to the edges of a manure storage site can cause the vehicle to tip over into the manure. --Decomposing manure creates a breathing hazard zone in enclosed areas or confined spaces because toxic

gases can accumulate and quickly overcome workers and cause them to fall into the manure and suffocate.

- Manure contains bacteria and other pathogens that can make workers sick.
- Damaged or poorly set up ladders can result in tip overs and falls.

Some prevention solutions are:

- Install a fence, concrete “ecology” blocks or other barriers around storage sites and place warning signs to prevent entry.
- Cover manure pits and tanks and post warning signs to keep unauthorized personnel out.
- Train workers about the dangers of manure pits, ponds, lagoons and tanks and instruct them about what they’ll need to do stay safe.
- Follow permit-required confined spaces rules if workers need to enter manure storage tanks and other confined spaces to inspect, make repairs, clear blockages or do other tasks.
- Wear appropriate PPE to protect against contact with bacteria and other harmful pathogens in animal waste.

Machinery and Equipment: Included are skid steers, tractors, power take-off shafts (PTOs), feed mixers, manure spreaders, augers and hay balers. Key hazards for these sources:

- Exposed moving mechanical parts like rotating shafts, belts and pulleys, flywheels and gears, chains and sprockets, blades and shear points can catch workers’ hands, feet, hair or clothing and cause life threatening injuries. The risk for harm increases when operating equipment, clearing jams and making adjustments.
- Dangerous movement of machinery due to unexpected start up or release of stored hydraulic, electrical, pressure and other types of energy can hurt workers during inspections, maintenance, cleaning and repairs.
- Rollovers when driving a skid steer or tractor.
- Drivers can fall when getting in and out of a skid steer or tractor.
- Entering spaces in large machinery may expose workers to confined space dangers (e.g., engulfment, amputation, electrocution, suffocation).

Some prevention solutions are:

- When you buy machines, look for well-designed safety features like covers or guards for dangerous moving parts.
- Keep machine safeguards in place and maintained.
- Safely install covers and other safeguards according to the manufacturer's specifications.
- Develop and follow lockout/tag out procedures and provide lockout devices (e.g., locks, tags) to prevent unexpected start-up of equipment.
- Train workers on mechanical hazards and safety procedures (including lockout/tag out) for operating machinery, removing jams, cleaning and other tasks.
- Keep clothing and hair secured so it can't get entangled.
- To reduce risk for skid steer and tractor rollovers, don't overload the bucket and keep it low. Seat belts and rollover protection systems (ROPS) save lives during rollovers.

1.3 Identifying herd health hazard and risks for poultry farm

According to the International Labor Organization (ILO), health hazards in poultry working environments are categorized as accidental, physical, chemical, and biological. Here are just a few examples for each category mentioned by this organization:

Accidental

- Sprains and strains due to slip and fall while carrying heavy loads.
- Eye and skin irritation resulting from contact with disinfectants, vaccines and medicines.
- Burns from exposure to hot surfaces (e.g. beak-trimmers).

Physical

- Exposure to high levels of noise.
- Long-time exposure to heat and cold due to outdoor work.
- Musculo-skeletal problems resulting from lifting and moving of animals, feed bins (bags), egg collection.

Chemical

- Respiratory problems resulting from exposure to dust, which is composed of feathers, dander, micro-organisms, etc.
- Respiratory, skin, and eye diseases due to exposure to gases including NH3, H2S, CO2, CO, and CH4.
- Exposure to disinfectants, detergents, formaldehyde and pesticides.

Biological

- Zoonotic infections. These diseases are transmitted between birds and humans.
- Antibiotic-resistant bacteria.

Respiratory problems

Many studies have shown that poultry farmers have a greater risk of respiratory problems than non-farmers. Each poultry house contains its own complex mixture of dusts and gases. Nature of this mixture is dependent on numerous factors including ventilation, type of poultry, feeding system, and waste management. Dust and gas levels are usually highest in winter. Organic dust is the most common respiratory contaminant. Organic dust is a combination of dusts with bacteria or fungi (fungal spores).

Ammonia is an irritating gas present in poultry barns. The occupational threshold for ammonia is generally 25 ppm. For short-term exposure (15 minutes), the threshold is 35 ppm. An ammonia concentration of 300 ppm is immediately dangerous to life. People who have worked in poultry barns for years often cannot detect levels below 50 ppm. Harmful gases in poultry houses are not limited to ammonia. H2S, CO2, CO, CH4 and vapors (associated with pesticides, disinfectants, and litter treatments) are also present and can cause health problems.

Exposure to dusts and gases results in responses in the respiratory system. These responses vary from one person to another, and may affect any part of the system. Potential responses include acute or chronic bronchitis (the most common reaction), increased airways reactivity, asthma, and chronic airway obstruction.

Zoonotic infections

Zoonotic diseases are transmitted from animals to humans and include bacterial, viral, fungal, and parasitic diseases. Salmonellosis, campylobacteriosis, chlamydiosis, tuberculosis, Newcastle Disease, and avian influenza are amongst the most common zoonotic diseases transmitted from poultry to humans. Poultry workers are at a greater risk of being affected by these diseases.

These and other health hazards in poultry commercial settings must be addressed through improvement in the working environment. In order to achieve this very important goal, both employers and employees are responsible. Training of employees plays a vital role in reducing the occurrence of these problems. Always know your work environment, the contaminants, and the potential hazards. Safety must always come first!

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choice the best answer (3 points)

1. List the three most important hazards in dairy farm (3 point)
2. List the hazards that may occur in poultry farm (5 points)
3. List zoonotic diseases which transmit from birds to human being (4 points)

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

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

Information Sheet-4	Identifying and assessing the critical areas of health abnormalities in production cycle of farm animals

4.1 Introduction

Managing cows correctly during the transition period (critical area in production cycle) is one of the most important factors for overall farm success. The calorie needs of a milking cow are massive, especially compared to a dry cow.

- Within the two days after a cow calves, the energy needs of that cow more than double.
- The metabolic stress associated with the increased energy demand can be dramatic.
- How the cow handles this stress and moves through the transition period influences her production, health, ability to become pregnant again and ability to remain in the herd.

During the transition period, nutrient requirements increase to support fetal growth and colostrum and milk production. Dairy cows are at greatest risk of developing diseases and conditions leading to involuntary culling during this time. Monitoring the transition dairy cow is important to recognize changes in performance.

4.2 Identifying and assessing the critical areas of health abnormalities in the production cycle of farm animals

The main goal of transition cow management is to decrease the amount of time the cow spends in a negative energy balance. The more time a fresh cow spends in a negative energy balance, the higher the probability she will have a health challenge.

Negative energy balance: The caloric needs of a recently calved cow (fresh cow) are so significant that most dairy cows do not initially eat enough to make up for the calories they are burning. This mismatch of burning more calories than the cow is taking in is a negative energy balance.

In other words, the cow is using more energy than she can acquire through her diet. The cow then takes the energy from the only other place available to her, her own body. This mostly results in accessing body fat stores for conversion to energy. In extreme cases, it can mean the cow degrades muscle and bone as well.

Transition period is related to some diseases such as milk fever, retained fetal membrane, vaginal and uterine prolapse, etc. When a cow calves (freshens), the cow has a sudden demand for calcium in her milk. Due to complications of her physiology, the cow cannot access calcium in her body from her diet or her bones as she usually would.

- The inability to properly regulate calcium results in a lack of bio-available calcium for a cow's normal bodily function.
- Calcium is a principal component of the muscle contraction process, and when it is not available, muscles do not contract appropriately.
- In a clinical case, the result is a cow that is unable to stand.
- The transition period allows opportunities to provide supplementation or to feed in a certain way both before calving and post-calving to minimize these problems.

Prolapse of uterus: Uterine prolapse is the protrusion of uterus through the vulva. A mass of uterus is found hanging through the vulva. In delayed cases the mass may get ruptured or lacerated by rubbing through the ground or walls of the cattle shed. It normally occurs immediately after calving or a few hours after calving. Prolapse of uterus is widespread in aged and malnourished animals. Animals with calcium deficiency are particularly susceptible to prolapse of uterus. The cattle owner or animal health worker immediately washes the prolapsed mass with mild antiseptic solution. If there is swelling of the mass, it is reduced using application of cold ice on the uterine mass. Alternatively, saturated sugar solution can also be applied for reduction of the uterine mass. The cattle owner immediately wraps the prolapsed mass with a wet towel and tries to keep it raised up to the level of the vulva. The prolapsed mass is not allowed to dry. Injuries to the prolapsed mass are avoided and veterinarian is immediately called for treatment.

Parturient paresis/milk fever/hypocalcaemia: It is a metabolic disease occurring most commonly about the time of parturition in adult females and is characterized by hypocalcaemia, general muscular weakness, circulatory collapse and depression of consciousness. IV administration of calcium borogluconate slowly, within 30 minutes of treatment animal will stand and relief from bloat.

- **Ketosis:** ketosis is basically the result of a negative energy balance early in lactation. High milk production causes energy (glucose) drain and the need for energy exceeds the capacity. A deficit in digestion or metabolism may result in inadequate amounts of glucose (hypoglycemia) available at the cellular level. In an effort to correct this condition, body fat and limited protein stores are mobilized for gluconeogenesis in the liver with a parallel rise in ketone body formation. These ketone bodies have a toxic effect to the CNS if the level rises beyond the physiological limit. It occurs most commonly during the first month of lactation, less commonly in the second month, and only occasionally in late pregnancy. The highest frequency is between 20-30 days after calving. IV injection of 500ml 50% glucose solution result in rapid improvement, however, relapse is common.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choice the best answer (3 points)

1. List the at least three disease which affect production during production cycle in dairy farm (3 point)
2. Describe negative energy balance (5 points)

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

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

Information Sheet-5	Identifying basic animal care and handling activities

5.1 Introduction

Proper housing, feeding, watering and management of animal facilities are essential to animal well-being, and to the health and safety of personnel. A good management program provides the environment, housing, feeding, watering and care that permit animals to grow, mature, reproduce, and maintain good health; provides for their well-being; and minimizes variations that can affect the production. Specific operating practices depend on many factors that are peculiar to individual institutions and situations. Well-trained and motivated personnel can often ensure high-quality animal care, even in institutions with less than optimal physical plants or equipment. Many factors should be considered in planning for adequate and appropriate physical and social environment, housing, feeding, space, and management. These include the species, strain, and breed of the animal and individual characteristics, such as sex, age, size, behavior, experiences, and health.

5.2 Feeding and Watering

The feeds and feeding program have a major influence on reproductive performance, growth rate and milk production and must be monitored regularly.

Nutrient requirement for dairy cows

Cows have two requirements: maintenance and production requirements. Maintenance requirement is the basic need necessary to maintain a stable condition. It is higher for a big cow than for smaller one and local breed has a lower requirement than an exotic and crossbred. Production requirement is the requirement of extra feed for growth, work and/or milk production. The nutrients required by dairy cows are water and dry matter (energy, protein, fiber, vitamin and minerals).

Cows consume more water than any other nutrients. Water is supplied free choice. If access to water is limited (restriction of water intake), milk production falls. Water consumption is influenced by milk production, access and competition, diet, DMI, diet

moisture content, environmental temperature and the content of various minerals in ration, particularly sodium. Lactating dairy cows in the tropics require 60 to 70L of water per day for maintenance, plus an extra 4to 5 L for each liter of milk produced.

Dry matter intake (DMI): when you formulate rations for high producing dairy cows, DMI should be the first consideration. The DM maintenance requirement for a small local cow (350 kg) is 7 kg DM/day and a large cow cross bred (500 kg) needs 10kg DM/day. The amount of dry matter required by milking/dairy cow is 2.5%-4% of its body weight each and every day. The following factors are influencing DMI:

- Body weight
- Forage quality and digestibility
- Stage of lactation
- Milk production level
- Butterfat content of the milk
- Exercise
- Environment
- Management
- Cow comfort
- Social interactions
- Body condition
- Feeding frequency and schedule
- Health status
- Ration balance and etc.

Energy: The most important aspect of any ration is to provide 'enough energy' to meet the animal's needs. The lactating cow needs energy for lactation, maintenance and growth (both for herself and her fetus). The cow's maintenance energy requirement depends on her level of activity and ambient temperature.

Fiber (Lignin): Dairy cows have an absolute need for certain fiber content. Adequate fiber content is necessary for optimizing digestibility of the ration, maximizing DMI, maintaining butterfat level in milk, stabilizing the ecosystem of the rumen, and preserving the health of the cow.

Protein: Protein is one of the most expensive constituents of the dairy cow's diet. It should be supplemented as dietary protein or microbial protein. Nonprotein nitrogen sources in the diet (examples, ammonia, urea, nitrate and others) are also used for protein synthesis by microbes.

Macro-minerals and micro-minerals: Imbalances, deficiencies and excess of various minerals are common in lactating cow rations despite wide availability of supplemental minerals. Macro-minerals are Ca, P, Mg, S, K, Na and Cl; micro-minerals include I, Fe, Se, Cu, Co, Mn and Zn. They are needed only in minute quantities.

Vitamins: The fat soluble vitamins A, D and E are necessary additive in dairy cow diets. Vitamin K is present in common feedstuffs, synthesized in the rumen and doesn't need supplementation.

Type of feed: Feed can be divided roughly into two groups: roughage and supplements (concentrate, protein supplement and feed additive). Roughage are less digestible than concentrate, high in fiber-more than 18% CF, <70% TDN and low in energy (straw, hay, silages, haylages, etc.). Concentrates are high in energy , low in fiber and highly digestible (80%-90%) and generally less than 20% crude protein and less than 18% CF (cereal, grain, beet and citrus pulp, nuts, roots and tubers and liquid such as molasses, fats, oils). Protein supplements contains more than 20% protein (soya bean meal, cotton seed meal, linseed meal-flax, legumes, brewery and distillery by-products, bone, blood, fish, chicken litter, feather, dried milk products). Feed additive: vitamins: yeast, fish oils, wheat germ oil; minerals: bone meal, calcium carbonate, limestone; non-nutritive supplements: buffers, ionophores, antibiotics, flavors, enzymes, hormones.

Nutrient requirement for poultry

As birds are fed in groups, the nutrient requirements are not expressed on an individual basis; but are expressed in unit weight of feed, and hence feed intake by the bird influences the nutrient requirements. Nutrient requirements of birds are also influenced by the age and size of the bird, production level, energy content of the ration, physical form of diet, sex of the bird, nutritional adequacy of the diet, and environmental temperature. Prescribing a common list of quantities of nutrients for birds at all seasons, for different ages and under all conditions, is therefore an extremely difficult task. Some adjustments need to be made based on the existing conditions and the area where the birds are reared.

To allow for variations in composition of feed ingredients, to avoid loss during storage, to allow for nutrients destroyed in the digestive tract, and to allow for stability of the nutrients, an increase in the supply of the nutrients over the minimum requirement is made as a safety margin. Minerals and vitamins are more prone to destruction, as stated earlier. For the majority of the vitamins, usually twice the required amount is added as a safety margin. The minimum requirement of trace minerals may be supplemented above any safety level present in the feed ingredients.

Water is an essential commodity in poultry production for the nutrients it possesses and its impact on feed consumption. Nipple drinkers to provide cleaner water reduce water spillage and labour for drinker cleaning has replaced the conventional open water system. Chicken consumed more water when reared with conventional open water system in an experiment that compared the conventional open water system to nipple drinking. However, when these drinkers were used to rear chicken in a controlled room with air velocity of 0.25 and 2.1 m/s, birds in the higher air velocity with nipple drinkers did not differ from those on open water drinkers, but experienced increased weight gain and better feed conversion than birds at the lower air velocity.

5.3 Housing

5.3.1 General housing of animals

The primary enclosure (usually a cage, pen, or stall) provides the limits of an animal's immediate environment. Acceptable primary enclosures:

- Allow for the normal physiologic and behavioral needs of the animals, including urination and defecation, maintenance of body temperature, normal movement and postural adjustments, and, where indicated, reproduction.
- Allow conspecific social interaction and development of hierarchies within or between enclosures.
- Make it possible for the animals to remain clean and dry (as consistent with the requirements of the species).
- Allow adequate ventilation.
- Allow the animals access to food and water and permit easy filling, refilling, changing, servicing, and cleaning of food and water utensils.

- Provide a secure environment that does not allow escape of or accidental entrapment of animals or their appendages between opposing surfaces or by structural openings.
- Are free of sharp edges or projections that could cause injury to the animals.
- Allow observation of the animals with minimal disturbance of them.

Primary enclosures should be constructed with materials that balance the needs of the animal with the ability to provide for sanitation. They should have smooth, impervious surfaces with minimal ledges, angles, corners, and overlapping surfaces so that accumulation of dirt, debris, and moisture is reduced and satisfactory cleaning and disinfecting are possible. They should be constructed of durable materials that resist corrosion and withstand rough handling without chipping, cracking, or rusting. Less-durable materials, such as wood, can provide a more appropriate environment in some situations (such as runs, pens, and outdoor corrals) and can be used to construct perches, climbing structures, resting areas, and perimeter fences for primary enclosures. Wooden items might need to be replaced periodically because of damage or difficulties with sanitation.

Some housing Systems has special caging and ventilation equipment, including filter-top cages, ventilated cages, isolators, and cubicles. Generally, the purpose of these systems is to minimize the spread of airborne disease agents between cages or groups of cages. They often require different husbandry practices, such as alterations in the frequency of bedding change, the use of aseptic handling techniques, and specialized cleaning, disinfecting, or sterilization regimens to prevent microbial transmission by other than the airborne route.

5.3.2 Housing of cattle farm

Different types and combinations of buildings and equipment are appropriate for different styles of management. The buildings and equipment that comprise dairy facilities are merely (only) tools that allow essential tasks prescribed by the management plan to be carried on a regular basis.

The primary basis for a management program is viewing the dairy herd as a series of management groups. As herd size grow, it becomes simply too much to think about every animal every day. In day to day management, each animals in the group can be thought of as the same. Group is simply a collection of animals that have similar needs in nutrition and environment need is so similar that these animals can be viewed collectively. It is essential to provide good housing and farm layouts. It is important to choose a location for buildings and handling facilities.

Farm layouts

Factors to be considered when choosing land for dairy farming (be key influences on location) are:

- Fertile, well-drained soil with properly designed surface water drainage
- No evidence of flooding during the wet season
- Situated away from streams, other bodies of water
- Year round supplies of sufficient clean water
- The site must permit the operation is infrastructurally open
- It should not be in the immediate vicinity of centers for civilization (avoid air pollution, keep out straying pets)
- Positioning on a fill if possible (incline 3-10%), for natural drainage and animals cooled by the breezes in the afternoon
- Fence feeding, floor composed of gravel and rocks (no mud as mud cause foot damage in the rainy season, reduce productivity, and creates favorable conditions for vector reproduction)
- Keep the farm vector free with regular cleaning and removal of dung or a dung can be piled up (heap) hence self-heating of the dung destroys the flies egg in the rainy season
- Where multi host ticks exist-build a double fence surrounds the area and the fence should be impenetrable to rodents
- The fed-lot location must not be contaminated with spores of pathogens of soil-borne diseases (example, waste lands used as waste disposal sites and where dead animals have disposed of)
- Treat tsetse fly resting places with selective application of insecticides

5.4 Sanitation

Sanitation is the maintenance of conditions conducive to health which involves bedding change (as appropriate), cleaning, and disinfection. Cleaning removes excessive amounts of dirt and debris, and disinfection reduces or eliminates unacceptable concentrations of microorganisms.

The frequency and intensity of cleaning and disinfection should depend on what is needed to provide a healthy environment for animal, in accord with its normal behavior and physiologic characteristics. Methods and frequencies of sanitation will vary with many factors, including the type, physical properties, and size of the enclosure; the type, number, size, age, and reproductive status of the animals; the use and type of bedding materials; temperature and relative humidity; the nature of the materials that create the need for sanitation; the normal physiologic and behavioral characteristics of the animals; and the rate of soiling of the surfaces of the enclosure. Some housing systems or experimental protocols might require specific husbandry techniques, such as aseptic handling or modification in the frequency of bedding change.

Agents designed to mask animal odors should not be used in animal housing facilities. They cannot substitute for good sanitation practices or for the provision of adequate ventilation, and they expose animals to volatile compounds that might alter basic physiologic and metabolic processes.

Bedding Change: Soiled bedding should be removed and replaced with fresh materials, as often as, if necessary to keep the animals clean and dry. The frequency is a matter of professional judgment of animal care personnel based on consultation with the investigator and depends on such factors as the number and size of the animals in the primary enclosure, the size of the enclosure, urinary and fecal output, the appearance and wetness of the bedding, and experimental conditions, such as those of surgery or debilitation, that might limit an animal's movement or access to areas of the cage that have not been soiled with urine and feces.

Cleaning and disinfection of primary enclosures: For pens or runs, frequent flushing with water and periodic use of detergents or disinfectants are usually appropriate to maintain sufficiently clean surfaces. If animal waste is to be removed by flushing, this will need to be done at least once a day. Animals should be kept dry during such flushing. The timing of pen or run cleaning should take into account normal behavioral and physiologic processes of the animals; for example, the gastrocolic reflex in meal-fed animals results in defecation shortly after food consumption.

The frequency of sanitation of cages, cage racks, and associated equipment, such as feeders and watering devices, is governed to some extent by the types of caging and husbandry practices used, including the use of regularly changed contact or noncontact bedding, regular flushing of suspended catch pans, and the use of wire-bottom or perforated-bottom cages. In general, enclosures and accessories, such as tops, should be sanitized at least once every 2 weeks. Solid-bottom caging, bottles, and sipper tubes usually require sanitation at least once a week.

Washing and disinfection of cages and equipment by hand with hot water and detergents or disinfectants can be effective but require attention to detail. It is particularly important to ensure that surfaces are rinsed free of residual chemicals and that personnel have appropriate equipment to protect themselves from exposure to hot water or chemical agents used in the process.

Waste disposal: Conventional, biologic, and hazardous waste should be removed and disposed of regularly and safely. There are several options for effective waste disposal. Contracts with licensed commercial waste-disposal firms usually provide some assurance of regulatory compliance and safety. On-site incineration should comply with all federal, state, and local regulations. Infectious animal carcasses can be incinerated on-site or collected by a licensed contractor. Hazardous wastes that are toxic, carcinogenic, flammable, corrosive, reactive, or otherwise unstable should be placed in properly labeled containers and disposed of as recommended by occupational health and safety specialists.

Self-check 5	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answer (4 point)

1. One of the following is included in animal care and handling
   A. Feeding
   B. Housing
   C. Sanitation
   D. All
2. One of the following is not acceptable primary enclosures of housing
   A. Allow adequate ventilation
   B. Are free of sharp edges that could cause injury to the animals
   C. Allow the animals access to food and water
   D. Allow for the normal physiologic and behavioral needs of the animals
   E. None

Test II: Write short answer

1. List the factors that influence dry matter intake (4 points)

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

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

Information Sheet-6	Selecting and planning disease prevention and controlling methods

6.1 Introduction

Farmers can improve the health, welfare and productivity of their animals through animal health planning. Animal Health Planning is a continuous improvement method that encourages the development of health building and disease control measures appropriate to the particular farm circumstances leading to a system that is progressively less dependent on veterinary medicines without jeopardizing welfare.

The Veterinary Authority in collaboration with stakeholders should develop a plan based on the goal of the disease control programme. Intervention options should be based on effectiveness, ease and cost of implementation, and expected benefits by reaching the objectives of the programme. Tools such as value chain analysis may be used to help understand the role of different players within the production system, identify critical control points to target measures and provide an indication on the incentives for and feasibility of implementation of the programme. In case of zoonotic diseases, close collaboration and coordination with public health authorities is necessary during programme planning and implementation.

6.2 Method of Disease prevention and control in farm animal

6.2.1 Immunization (Vaccination) of farm animals

- Vaccination is a practice of artificially building up in the animal body immunity against specific infectious diseases by injecting biological agents called vaccines.
- The term vaccine is used to denote an antigen (substance form organisms) consisting of a live, attenuated or dead bacterium, virus or fungus and used for the production of active immunity in animals.
- The term also includes substances like toxins, toxoids or any other metabolites etc. produced by microbes and used for vaccination.
- The farm animals and young ones should be vaccinated at regular intervals at appropriate times.
- Vaccination should be done with consultation of veterinarians.

6.2.2 Early diagnosis and treatment of sick animals

The key to success in handling animal disease epidemics is early detection. If a disease can be detected very early in the phase of epidemic development, the possibility exists that it can be arrested and eliminated before it actually inflicts damage. Early detection presupposes that there is a surveillance system in place that will bring infection to light when it is first seen. The country's veterinary authorities are then placed in the position of being able to manage the problem before it becomes uncontrollable, thus protecting the local livestock industry and ensuring food security for those closely dependent upon livestock. That is why this manual is all about surveillance. Early detection enables early warning and an early reaction. Surveillance is the primary key to effective disease management.

6.2.3 Isolation of sick animals

- Isolation means segregation of animals, which are known to be or suspected to be affected with a contagious disease from the apparently healthy ones.
- Segregated animals should be housed in a separate isolation ward situated far away from the normal animal houses and should be treated early.
- The isolation ward should never be at a higher level than that of the healthy shed.
- If a separate accommodation is not available the animals concerned should be placed at one end of normal animals' buildings, as far away from healthy stock as practicable.
- Attendants working on sick animals and equipment such as buckets, shovels etc. used for them should not be used for healthy stock. If this is not practicable, the sick animals should be attended to daily, after the healthy stock. After this, the equipment should be thoroughly disinfected before they are used on healthy stock next day; the attendant too should wash his hands and feet in antiseptic and discard the clothes in which he worked.

6.2.4 Quarantine for newly purchased animals

- Quarantine is the segregation of apparently healthy animals (especially animals being brought into the herd for the first time), which have been exposed to the

risk of infection from those animals, which are healthy and unexposed to the risk of infection.

- The idea is to give sufficient time for any contagious disease that the quarantine animals may be having, to become active and obvious. Hence, the quarantined period depends on the incubation period of a disease. But in practice a quarantine period of 30 days covers almost all diseases.
- For rabies, the quarantine period should be about six months.
- During the quarantine period, animals should be thoroughly screened for parasitic infestation by faecal examination and de-worming carried out on the 23rd/24th day, if need be.
- The animals should also be subjected to dipping or spraying on the 25th/26th day for removing ectoparasites if any.

6.2.5 Cleaning and disinfection of Practice

- The premises (sheds, stables, and kennels) and pastures should be prevented from contamination.
- Elimination of parasites from the host at the most appropriate time by use of antiparasiticides thereby preventing pasture contamination.
- Destruction of adult parasites in hosts prevents expulsion of eggs or the larvae and the associated contamination of the environment.
- Ovicidal drugs should preferably be used to destroy the eggs, thereby preventing environmental contamination.
- Anthelmentic treatments prior to rainy seasons using larvicidal drugs will prevent contamination of pastures at a time when conditions are becoming favourable for egg and larval development.
- Proper faeces disposal will give satisfactory control of faecally transmitted monoxenous parasites of animals.
- Faeces or litter may be heaped to destroy the eggs/oocysts of parasites.
- Pens and pastures should not be overstocked.
- Reducing the stocking rate can significantly reduce the parasite burden in animals and the associated problem of contamination in sheds and pastures.

6.2.6 Control animal movements

Domestic and wild animal population movements are important in the spread of disease. There are many recent examples of disease spread that have occurred as a result of intentional movements of livestock or wildlife. Livestock and animals movements can be the subject of legislation or strict controls and there is a real opportunity to reduce disease transmission.

6.2.7 Deworming of animals

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

Self-check 6	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. _____is the segregation of apparently healthy animals before mixing to farm animals (2 points)
2. _____is a practice of artificially building up in the animal body immunity against specific infectious diseases by injecting biological agents (2 points)
3. List the methods of diseases prevention in farm animals (6 points)

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

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

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

Operation Sheet- Performing diseases Prevention by immunization

Materials: syringe (treatment and vaccination syringe), vaccination needle, vaccine (anthrax vaccine), ice box, water),

Procedures

The following procedures are provided as a step-by-step for vaccination.

Step 1: create community awareness and construct crush

Step 2: prepare materials

Step 3: reconstitute/dissolve the vaccine by distilled water

Step 4: by seeing instruction administer vaccine (performing vaccination)

LAP TEST	Performance Test

Name……. ID……..
Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **1** hour. The project is expected from each student to do it.

Task- Perform anthrax vaccination

LG #73	LO #3- **Participate in the implementation of regular herd health activities**

Instruction sheet

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

- Performing and analysing visit and follow up of the animal farms
- Carrying out schedule and emergency treatment of sick and injured animals
- Conducting screening and testing of the herd for major animal health risks
- Identifying and assessing the critical areas of health abnormalities in the production cycle of farm animals
- Identifying and minimizing health abnormalities
- Preventing entrance and disseminations of source of disease to the animal farms
- Performing pre-selected and planed disease prevention and controlling
- Identifying health abnormalities of non-productive animals and giving recommendations for producers

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

- Performing and analysing visit and follow up of the animal farms
- Carrying out schedule and emergency treatment of sick and injured animals
- Conducting screening and testing of the herd for major animal health risks
- Identifying and assessing the critical areas of health abnormalities in the production cycle of farm animals
- Identifying and minimizing health abnormalities
- Preventing entrance and disseminations of source of disease to the animal farms
- Performing pre-selected and planed disease prevention and controlling
- Identifying health abnormalities of non-productive animals and giving recommendations for producers

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 all 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 “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets

Information Sheet-1	Performing and analyzing visit and follow up of the animal farms

1.1 Introduction

The components of a herd health management program includes regularly scheduled farm visit by the veterinarian, good farm management by the producer, the recording and analysis of animal health and production data, and the provision and coordination of advice by veterinarian. There must be a long term commitment to continuous improvement to reduce unnecessary variations in production. The management styles of the producer and the veterinarian must include systems thinking and innovation, and must be a vision of the future. All efforts must be directed toward the goal of producer. The success of the program depends on the competence of the veterinarian, the level of management of the producer, the reliability and adequacy of the records, and the competence with which the veterinarian provides advice and follows up the results of that advice.

1.2 Doing a regular farm animal visit

Activities during the farm visit

The veterinarian activities conducted during each visit are similar for each species or class of livestock, but the specific activities vary according to the class of livestock, the season of year, and the length of time the herd has been on the program. In general farm visit activities address the following 3 areas on the farm:

- the animals (cows and young stock),
- the animals' environment including management practices,
- the available farm-data

The primary purpose of the farm visit is to organize and concentrate the veterinary activities into a regular schedule to ensure that they get done. There are several animal health and production activities that occur during the production cycle of each animal. A major objective of the visit is to determine the actual performance of animal health and production, compare it with targets of performance and farm goals, and decide which performance index is abnormal. The veterinarian then attempts to determine the

cause(s) of shortfalls in health status or production and formulate cost effective corrective action. The regularly scheduled farm visit is also part of a surveillance system designed to detector predict animal health and production problems before they become economically significant and to indicate the corrective action necessary. Under ideal conditions, each visit should provide a summary of the animal health and production status, the reasons for failure to achieve certain targets of performance, and recommendations for corrective actions.

Table 1: Examples of routine monitoring and visiting at dairy farm

Animal	**Environment and management**	**Farm data**
Body condition score, BCS	Housing & equipment	Milk recording data
Rumen fill score, RF	Climatic conditions	Milk quality information
Faeces consistency score	Milking machine function	Information on AI sires
Undigested faeces-fraction	Milking practice	Feedstuff analysis results
Clinical disease cases	General hygiene standards	Water quality analysis data
Udder hygiene scores	Pasture exploitation	Soil analysis data
Young stock growth rate	Formalin foot bathing	Ration composition data
	Herd claw trimming	AI data on dams
	De-worming & vaccination	Records of used antibiotics

Some examples of specific farm visit activities:

- Surveillance of reproductive performance
- Monitoring and analysis of production performance
- Breeding program and genetic selection
- Monitoring nutritional status
- Clinical and pathologic examination of animals
- Analysis of diseases occurrence
- Examination and discussion of records and reports
- Emergency farm visit

- Investigation of outbreak and crisis management
- Meeting and discussion with participant producers
- Provision of drug and vaccine
- Prevention of zoonosis, and drug residue avoidance, etc.

1.3 Analyzing performance record

One of the most important components of any successful herd health program is keeping good records that can be used to monitor animal health events, levels of production, and the incidence of disease. A simple reliable system of recording animal health events and production performance is a fundamental requirement for a successful herd health program. Without recording, the analysis of productivity involves guesswork, and the recommendations for improvement cannot be made with confidence.

The animal health and production records system involves all components, from the record containing raw data to the summaries of animal health and performance. Many different systems are available, but the fundamental requirements include the following:

- Positive identification of the individual animal or groups of animals is necessity.
- The system must be simple to use and understand
- Only animal health and production data considered necessary to assess herd performance are monitored and analyzed
- The system must be structured so that the data are easily collected, gathered, analyzed, summarized and available to the producer as soon as possible after the herd visit of the veterinarian
- The veterinarian should maintain a file of each summary report available on the producer
- In the simplest form of record keeping, the data from individual animal cards or from groups of animals are collected and analyzed regularly, and summary of herd performance are reported.

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: choose best answer

1. One of the following is routine activities during farm visit (2 points)
   A. Recording milk yield
   B. Analysis water quality
   C. Clinical examination of sick animals
   D. All

Test II: Short Answer Questions

1. List some examples of specific farm visit activities (5 points)
2. Describe the activities performed during farm visit (3 points)

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

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

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

Information Sheet-2	Carrying out schedule and emergency treatment of sick and injured animals

2.1 Carry out schedule for visit animal farm

The most common aspect of any herd health program is the regularly scheduled visit to the herd or flock. The frequency of visits depends on the class of livestock, the size of the herd, the prevalence of disease, the existence of a particular diseases problem, the level of risks aversion of the producer, and the length of time the herd has been on a program. Monthly visits are common for year round calving dairy herd within fewer than 100 cows. Weekly visits become necessary for large herds. For large dairy herds, some veterinarians travel long distances to get the farm and then spend long periods working through the various aspects of the herd. Four yearly visits are common for commercial beef herds, and weekly or daily visits are usually necessary for beef feedlots with a total capacity of 5000 or more head. For 100 sows, farrow-finish swine herds, monthly visits are common.

2.2 Conducting emergency treatment of sick and injured animals

The ability to manage an emergency quickly and effectively is an essential part of our safety management system. It is responsibility to ensure that all managers, workers and contractors understand what to do during an emergency on the farm. First aid for farm animals means immediate treatment of injuries or any other sudden illness in the animals. The objectives of first aid are to save life of the animals and to reduce their pain and suffering. Timely first aid prevents the situation from deteriorating further and promotes recovery of the ailing animal. First aid is done in situations of life-threatening emergencies which require immediate action by the owner or animal health workers.

Constipation

Constipation is regarded as the sign of other diseases rather than a disease itself. Constipated animals cannot defecate and they pass with difficulty very hard droppings. Constipation can be treated by giving an enema. Enema is the administration of a medicine or warm soapy water into the rectum through anus. Affected animals are offered plenty of drinking water.

Tympani

It is the abnormal expansion of the rumen and reticulum caused by accumulation of gases in the rumen. Most common clinical signs include expanded left abdomen. The animal experiences pain and discomfort and refuses to graze. The animal feels strained while urinating and defecating with rapid or difficult breathing. The animal may keep the mouth open with protruding tongue and it could die in few hours if tympani persists. For the treatment of early or mild cases, anti-bloat preparations available in the market are given orally. In moderately affected animals, stomach tube (special type of tube) can be passed to release the rumen gases and in severe cases, passage of trocar and cannula is done into the rumen high on the left flank (where the swelling is greatest) to release rumen gases. Passage of stomach tube or use of trocar and cannula requires special veterinary training. Vegetable oil (250–500 ml) or paraffin oil (100–200 ml) is traditionally used to relieve the animals suffering from tympani.

Fig. 1: Bloat

Impaction

Impaction of rumen means dense packing of rumen with indigestible roughage. It is caused due to ingestion of large amounts of highly fermentable carbohydrate rich food or the leftover of parties or marriages. Common signs start appearing within 6–12 hours of ingestion and include restlessness, kicking at the belly, frequent lying down and getting up and enlargement of upper abdomen on the left side of the belly. The animal goes completely off feed and can even die. For treating the conditions of impaction, the affected animal's access to grains is restricted and the animal is made to exercise vigorously for half an hour for 3 times daily. Water is allowed to the animal in limited

quantities at a time. About 200–400 g of sodium bicarbonate dissolved in 1 to 2 liters of water is given orally to the affected animal.

Diarrhea

Diarrhea means the passage of loose and watery faeces by the animal in increased frequency. The faeces vary in consistency from being soft to liquid. Diarrhea causes dehydration in affected animals. The affected animal shows signs of dullness, depression, lethargy and weakness with sunken eyes. Diarrhea is caused due to infectious or dietary reasons. The treatment for diarrhea is aimed at correcting the cause of diarrhea. If it is of dietary origin, the diet is corrected. If it is due to some infection, suitable medicines are given. Initially the digestive system of the animal is given some rest by withholding the feed or offering very light and easily digestible feed for the first 24 hours. To overcome dehydration, plenty of clean drinking water is offered to the affected animal. The ailing animals are orally given glucose along with electrolyte solution. All these conditions when detected timely can be easily managed with the help of preliminary treatment. If improvement is not seen within few hours, then such conditions may be life-threatening for the animal requiring veterinarian's immediate attention.

Fig. 2: Diarrhea

Poisoning

It is a condition in which the animals suffer from a toxic substance or venom of an animal. Poisoning causes deleterious effects on the animals. Animals might swallow the poison, inhale it or absorb it through the skin. Even overdose of medicines given to animals may prove poisonous. Usually farm animals suffer from poisoning by eating poisonous plants, accidentally ingesting urea, rodenticides, pesticides, etc. Poisoning

causes minor irritations like mild abdominal pain, dullness and depression in the animals. In severe cases, the animal refuses to take feed and shows sudden onset of nervous signs like muscular trembling, convulsions and excessive frothing from the mouth. The animal may ultimately die if not treated in time. Different animal species are susceptible to different plants and poisons. Young animals are generally more susceptible to poisoning than adult animals. Animals may build up resistance to certain poisons by being exposed to small quantities of that poison over prolonged periods. If a large quantity of such a poison is consumed, they may not show symptoms of poisoning because their body is already accustomed to handle that poison.

General principles of first aid in case of poisoning include immediate attention to the affected animal. If the route of poisoning is through ingestion then purgatives are given to the affected animals. Under field conditions, the poisoned animal is fed with crushed coal because charcoal acts as an antidote for poisoning. If the animal is suspected of poisoning through skin, then the skin of the animal is washed thoroughly with soap and water. Apart from these, expert veterinary care is necessary.

Sun stroke

It is also known as heat stroke. Sun stroke is an emergency situation which results due to excessive muscular exertion of the animal in high environmental temperatures and humidity. Sun stroke results in hyperthermia in the animal. Hyperthermia is the elevation of body temperature above 104ºF, which leads to increase in heart rate and respiration rate coupled with restlessness. Hyperthermia causes difficulty in breathing and convulsions and could result in death of the animal. The treatment for heat stroke consists of reducing the body temperature of the animal. The affected animal is immediately moved to shaded and well-ventilated areas. Water is poured on the body and adequate glucose and water is given orally to the animal. Cold water enema may also be given in some cases depending on the severity of sun stroke. Special veterinary attention is required for the complete recovery of the animal.

Electrocution

Electrocution means accidental injuries or death caused by electric shock passing through the body of the animal. It can happen due to lightning, high voltage electric current from fallen transmission wires and accidental chewing of live electric wires. An animal may come directly in contact with such wires or indirectly through electrification of ponds by fallen electric transmission wires. The clinical signs of electric shock depend upon the amount of voltage to which the animal is exposed. In most cases of electrocution by lightning stroke, the animal dies on the spot and falls without any struggle. Occasionally, affected animal becomes unconscious but may recover in a few minutes to several hours. Other signs of electrocution are depression, blindness, etc., which may persist for few days or weeks. Electrocution due to lightning can be detected on the basis of history of lightning, single mark of injury on the dead body of the animal and damage to the immediate environment like burning of adjoining ground area. Treatment is carried out in mildly affected animals and on the basis of clinical signs observed in them. Affected animals are kept in quiet and calm area with minimum disturbances. Adequate water is offered to the affected animals. Skin wounds are treated with application of antibiotic creams.

Burn injuries

Burn injuries mean any type of thermal injury caused by fire, flames and hot solids. Injuries caused by hot fluids or steam are termed as scald. The extent of a burn injury depends upon the temperature of the hot object and the duration of time for which it came in contact with the animal. Depending upon the involvement of skin tissue, burns may be classified into three categories, i.e., first degree burn injury, second degree burn injury and third degree burn injury. Common clinical signs of burn injuries involve pain, thirst, anaemia and loss of necessary salts from the body. There is swelling, redness and blisters in the affected areas. The recovery and survivability of the affected animal depends upon the body area involved, rather than the degree of burn. For treatment, local dressing of the burn with antiseptic like Betadine is done. The contamination of the wound is prevented by covering the area with clean and sterile cloth. Sufficient water and glucose solution is given to the animal.

Prolapse of uterus

Uterine prolapse is the protrusion of uterus through the vulva. A mass of uterus is found hanging through the vulva. In delayed cases the mass may get ruptured or lacerated by rubbing through the ground or walls of the cattle shed. It normally occurs immediately after calving or a few hours after calving. Prolapse of uterus is widespread in aged and malnourished animals. Animals with calcium deficiency are particularly susceptible to prolapse of uterus. The cattle owner or animal health worker immediately washes the prolapsed mass with mild antiseptic solution. If there is swelling of the mass, it is reduced using application of cold ice on the uterine mass. Alternatively, saturated sugar solution can also be applied for reduction of the uterine mass. The cattle owner immediately wraps the prolapsed mass with a wet towel and tries to keep it raised up to the level of the vulva. The prolapsed mass is not allowed to dry. Injuries to the prolapsed mass are avoided and veterinarian is immediately called for treatment.

Fig. 3: Uterine prolapse

Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Say True or False (4 point each)

1. The management of a bleeding wound requires
   A. heat
   B. ligation
   C. pressure
   D. All of the above
2. The outcome of poisoning may be manifested as
   A. mild abdominal pain
   B. depression
   C. convulsions
   D. All of the above

Test I: Say True or False (4 point each)

1. _____ is a condition in which animals suffer from toxic substances.
2. The accidental injuries or death caused by electric shock is termed as _____.

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

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

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

Information Sheet-3	Conducting screening and testing of the herd for major animal health risks

3.1 Definition of screening

Screening is a particular type of diagnostic survey. It is the identification of undiagnosed cases or diseases using rapid tests or examination. Disease screening is the application of test to apparently healthy animals in order to detect infection or subclinical disease. The aim is to separate apparently healthy individuals that probably have a disease from those that probably do not. The objective is to identify the affected individual testing positive. E.g., California mastitis test and or somatic cell counts (SCC) are used as a screening test for sub clinical mastitis in dairy cattle and tuberculin test is used for detection of tuberculosis in farm animals.

An animal's future depend up on whether it reacts 'negatively', 'inconclusively' or 'positively' to screening tests. In screening the individuals that return a negative result to the screening test are considered definitive negatives and not submitted to any further examination or tests. Screening tests are not intended to be diagnostic; individuals with positive test results (example, that are classified as diseased or infected by the screening test) usually require further investigation for definitive diagnosis. Abnormal results (or those with any positive in screening test) are subjected to confirmatory test. In veterinary medicine, confirmation is followed by treatment or destruction of affected individuals depending on type of disease identified.

Screening may also be performed to find patients at high risk of developing a disease (breast or cervical cancer in human). But in national disease control programs the initial test (screening test) result is taken as the state of nature. In veterinary medicine, during screening programme the question posed is: which animals or which herds in this population have been affected by a given infectious agent? In order to provide answer, a single investigation is generally undertaken.

Diagnosis refers to the identification of a disease or other specific health state in an individual or a group of individuals (herd or flock) showing clinical signs. It is thus

undertaken for sick animals (presence of clinical signs or lesions). Here below there are difference and similarity of diagnosis and screening.

Screening	Diagnosis
• Identify affected individual	• Identification of disease
• Individual or groups of individuals	• Individual or groups of individuals
• Absence of clinical signs or lesions	• Show clinical signs or presence of lesions
• Apparently healthy animals	• Sick individual or sick small groups
• Involve easy procedure	• Involve more complex procedure

3.2 Type of screening

Screening can be undertaken on an occasional, on systematic base, perceptive or genetic screening.

Occasional screening: Classified into case finding and strategic screening.

Case finding is only applied in individual instance (outbreak of contagious diseases). You screen neighboring herds for the disease or examine herd which have trade link with the farm (e.g., FMD). Strategic screening is a screening targeted at animals only in areas where there have been cases of disease (e.g., the serological sampling of sheep within a 3 km radius of premises on which FMD has been diagnosed.

Systematic screening

Systematic screening refers to screening applied on a regular basis to all the individuals of a population or to all the individuals in certain groups. It is further divided into selective screening and mass screening. Selective screening involves screening only certain individuals (for example, new stock before their entry into the herd). Mass screening is when tests are applied to all the individuals in the population or t large, unselected population (example, the screening of cattle population for bovine tuberculosis or brucellosis). As examples the following procedures is screening of tuberculosis in the farm animals:

Procedures of tuberculin test to test bovine TB:

- On Day 1 of the test, two sites are clipped on the neck of the animal
- The skin thicknesses at both sites are measured and recorded
- Two types of tuberculin, one made from killed *M. bovis* and the other from killed *Mycobacterium avium*, are injected under the outer layer of the skin of the neck (i.e. into the dermis) at the 'bovine site' and the 'avian site' respectively.
- On Day 4 of the test, the skin reactions to the two types of tuberculin are measured and compared.
- Interpretation:
    - ✓ When the bovine site reaction exceeds the avian site reaction by more than 4 mm, the animal is declared a reactor under standard interpretation.
    - ✓ When the bovine site reaction measures 1-4 mm more than the avian site reaction, the animal is declared an inconclusive under standard interpretation

Prescriptive screening

Prescriptive screening aims at early identification of a disease that can be controlled better if they are detected early in their pathogenesis (example, mammography and other techniques to detect breast cancer in women, measurement of heavy metal level s in wild and domestic animals).

Genetic screening

Genetic screening is an aid for identification of genetic conditions and predispositions. Genetic screening is to identify diseased animals by screening either the total population at risk or the part that is mainly responsible for the maintenance of a particular disease.

3.3 Importance of screening

To control disease

The majority of control programmes for infectious diseases are based, at least partially, on the detection of infected individuals (example, screening or case finding). In

domestic animals probably the major economic loss is due to the effects of hidden (inapparent) or subclinical diseases, example, subclinical mastitis.

To acquire knowledge

Secondly screening may be important to gain or acquire knowledge of the frequency and distribution of infectious and noninfectious agents of disease and of immune response to these agents. This knowledge greatly assists our understanding of diseases processes and the importance of various agent in syndromes such as pneumonia or gastroenteritis.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: write short answer

1. _____ is refers to screening applied on a regular basis to all the individuals of a population or to all the individuals in certain groups (2 points)
2. List the importance of screening (2 points)
3. List and describe different type of screening (4 points)
4. Write the difference between screening and diagnosis (4 points)

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

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

Information Sheet-4	Identifying and assessing the critical areas of health abnormalities in the production cycle of farm animals

4.1 Identifying the health abnormalities in the production cycle of farm animals

The main goal of transition cow management is to decrease the amount of time the cow spends in a negative energy balance. The more time a fresh cow spends in a negative energy balance, the higher the probability she will have a health challenge.

Negative energy balance: The caloric needs of a recently calved cow (fresh cow) are so significant that most dairy cows do not initially eat enough to make up for the calories they are burning. This mismatch of burning more calories than the cow is taking in is a negative energy balance.

In other words, the cow is using more energy than she can acquire through her diet. The cow then takes the energy from the only other place available to her, her own body. This mostly results in accessing body fat stores for conversion to energy. In extreme cases, it can mean the cow degrades muscle and bone as well.

Transition period is related to some diseases such as milk fever, retained fetal membrane, vaginal and uterine prolapse, etc. (**SEE PAGE 73, 82-83**). When a cow calves (freshens), the cow has a sudden demand for calcium in her milk. Due to complications of her physiology, the cow cannot access calcium in her body from her diet or her bones as she usually would.

- The inability to properly regulate calcium results in a lack of bio-available calcium for a cow's normal bodily function.
- Calcium is a principal component of the muscle contraction process, and when it is not available, muscles do not contract appropriately.
- In a clinical case, the result is a cow that is unable to stand.
- The transition period allows opportunities to provide supplementation or to feed in a certain way both before calving and post-calving to minimize these problems.

4.2 loss of production

Abnormalities occurred in production cycles have a great economic impact. The losses are as a result of decreased milk production, decreased efficiency of milk production, and veterinarian cost and death in serious case.

4.3 Taking correction action on abnormalities

To prevent transition cow problems, we have to reduce the amount of time the cow spends with a negative energy balance. To do that, the cow has to eat:

- We have to allow the cows to maximize feed intake.
- Cows need to take in enough calories to balance the scales.
- Bunk space, pen space, ration, feed mixing, feed delivery, water availability, and many more things impact feed intakes.

Appropriate stocking density, depending on breed and parity, is important to prevent negative health and production outcomes in early lactation. Stocking density during the far-off period should not exceed 100 percent of headlocks. For the close-up period the ideal stocking density varies according to breed: 80 percent for Holsteins and up to 100 percent for Jerseys, based on headlocks. Other cow comfort parameters such as heat abatement and stall design are essential to minimize stress during the transition period. Appropriate stall design, size and bedding management will improve animal use of the beds, improve lying time and improve milk production.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Choose the best answers (3 points each)

1. One of the following is true
   A. Within the two days after a cow calves, the energy needs of that cow more than double.
   B. The metabolic stress associated with the increased energy demand can be dramatic.
   C. The transition period influences her production, health, ability to become pregnant again and ability to remain in the herd.
   D. All
2. One of the following is true
   A. Appropriate stocking density, depending on breed and parity, is important to prevent negative health and production outcomes in early lactation.
   B. allow the cows to maximize feed intake prevent cows transition problems
   C. Calcium is a principal component of the muscle contraction process, and when it is not available, muscles do not contract appropriately.
   D. All

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

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

Information Sheet-5	Identifying and Minimizing Health Abnormalities

5.1 Introduction

The most important metabolic diseases in dairy cows, ewes and goats can be discussed as energy and/or fiber related, lipid related or vitamin and mineral related disorders. Energy related disorders (related to energy density of the diet or feed intake) include fatty liver and ketosis, rumen acidosis, laminitis, displaced abomasums and milk fat depression. As energy density and fiber content of the diets are often inversely related, most of these diseases can be considered as fiber related too. Fatty liver and ketosis also can be categorized as lipid related disorders due to changes in lipid metabolism in affected animals. The most important mineral/vitamin related disorders are hypocalcaemia, hypomagnesaemia, udder edema, retained placenta and metritis. Not all of them are ultimately caused by mineral composition of the diet, but may be prevented by manipulation of minerals or vitamins in the diet.

Infectious diseases that affect reproduction are prevalent throughout the state. The effects may be sterility, low pregnancy rates, abortion or weak calves. The most common reproductive diseases are brucellosis, leptospirosis, vibriosis and neosporosis.

5.2 Abnormalities due to environmental

Heat stress

Heat stress can contribute to the occurrence of lameness in dairy and beef cows. Lameness in cattle may be defined as any foot abnormality that causes an animal to change the way that it walks. Lameness can be caused by a range of foot and leg conditions, themselves caused by disease, management, or environmental factors and is one of the most significant health, welfare, and productivity issues. The contribution of heat stress to lameness is perhaps due to ruminal acidosis or increased output of bicarbonate. Heat-stressed cattle eat less frequently during cooler times of the day, but they eat more at each feeding. Reduced feed intake during the hotter part of the day, followed by increased feeding when the ambient temperature cools down, can cause acidosis which is considered a major cause of laminitis. As ambient temperatures rise, the respiratory rate increases with panting progressing to open-mouth breathing. A consequence is respiratory alkalosis resulting from a rapid loss of carbon dioxide. Cattle

compensate by increasing urinary output of bicarbonate. Rumen buffering is affected by a decreased salivary bicarbonate pool. Lameness, with sole ulcers and white line disease, will appear in a few weeks to a few months after heat stress.

The reduction of feed intake combined with increased energy expenditure for maintenance may alter energy balance and explain why heat-stressed animals lose body weight and/or mobilize adipose tissue during heat stress. In particular, during summer, early lactating dairy cows are more likely to experience subclinical or clinical ketosis and are at higher risk to develop liver lipidosis. Ketosis is a metabolic disease that occurs when the animal is in a severe state of negative energy balance, undergoes intense lipomobilization, and accumulates ketone bodies, which derive from incomplete catabolism of fat. Liver lipidosis is another consequence of the intense mobilization of fat from adipose tissue. Compromised liver function in heat-stressed cattle is testified by reduced albumin secretion and liver enzyme activities.

Respiratory infection due to poor ventilation

Respiratory disease complex

Respiratory infections in chicken and turkeys are seen worldwide but especially in temperate poultry-producing areas in winter months. A number of respiratory viruses (Infectious Bronchitis, Avian pneumovirus, Lentogenic Newcastle disease virus, vaccinal and field strains) and bacteria (Ornithobacterium rhinotracheale, E. coli) may be involved. Dust, ammonia and other gases, and other factors associated with poor ventilation, may act as predisposing factors. Clinically it characterized by snick, sneezing, head swelling, conjunctivitis, nasal exudate and rattling noises.

Treatment and prevention

- Antimicrobial treatment of specific bacterial infections
- Effective ventilation, sanitation of drinking water, carefully applied appropriate viral vaccines

Injury due to slippery floor: Lameness due to muscular strains in the upper leg can occur on slippery floor surfaces:

- Adequate bedding and regular cleaning out of pens and walkways is required to minimize the chances of these injuries.
- Where the surface of the floor has become smooth it should be treated using a concrete cutting tool.

5.3 Abnormalities due to stressor

Common Stressors in Dairy Cows

The acts of giving birth (calving) and stopping milk production (dry-off) cause stress in the dairy cow. However, these events are a normal part of the lactation cycle and must occur for cows to reach their milk production potential. They are examples of acute stress.

Around the time of calving, cows experience a cascade of hormonal, metabolic, nutritional, and environmental changes that challenge the immediate health and performance of dairy cows. At calving, an increase in cortisol concentration, a decrease in serum calcium levels and a decrease in feed intake contribute to immunosuppression. At dry off, cows experience an engorgement of the udder with milk that can cause teat end leakage and increase the cow's risk of mastitis. At the same time, cows are placed in new social groups and are subjected to dietary changes. At dry off, cows increase their production of cortisol and experience increased somatic cell counts (SCC) in their milk. Both dry off and calving results in reduced immune function and a greater risk of diseases.

Social stress stems from a cow's relationship with her herd mates and encompasses all the social factors that impact cow behavior, health, performance and overall well-being. Common social stressors faced by dairy cattle include pen moves, overstocking, co-mingling of young and mature cows, and limited feeding space. The negative impacts of social stress include impaired immunity, increased SCC, and lower milk production.

All animals require a constant supply of clean, fresh air. Adequate ventilation removes excess heat, moisture, dust, microbes, and gases that accompany housed animals. Poor ventilation is identified by observing condensation on curtains, ceilings and support

structures, and increased moisture and ammonia concentrations. Poor air quality can result in immune suppression and an increased incidence of pneumonia.

Proper handling is often called good stockmanship. Improper (or rough) handling of dairy cattle is a psychological stressor which is characterized by fear resulting from new or unfamiliar events, pain, excessive noise, touch, and visual experiences. Improper handling has been shown to increase cows' fear of humans, while gentle handling can reduce fear. Improper handling can result in both acute and chronic stress which may result in reduced milk production.

The majority of research on the impact of transportation on cattle has been conducted with beef cattle. These studies have shown that hauling cattle long distances can reduce dry matter intake and average daily gains. Some studies have also shown that cattle hauled long distances have suppressed immune function that may increase their risk of disease (e.g. pasteurollosis). We can speculate that hauling dairy cows, calves, or springing heifers long distances may also result in reduced immune function.

5.4 Nutritional related diseases

A. Parturient paresis/milk fever/hypocalcaemia

Definition: it is a metabolic disease occurring most commonly about the time of parturition in adult females and is characterized by hypocalcaemia, general muscular weakness, circulatory collapse and depression of consciousness.

Etiology: sudden loss of calcium through milk at or near the time of parturition. Serum phosphorus is decreased but Serum magnesium is increased. Hypocalcaemia causes general muscle weakness, circulatory collapse, depression and unconsciousness.

Clinical findings: there are three different stages of milk fever:

Stage 1 is a brief excitement and tetany with hypersensitiveness and muscle tremor of the head, flank and limbs. Animal is able to stand but restlessness, shuffling feet, bellowing, and open-mouth breathing with tongue extension.

Stage 2 is sternal recumbency. In this case the patient is unable to stand, depression, anorexia, subnormal temperature, loss of defecation and urination, GIT atony (i.e. mild bloat, constipation), decreased heart sound, retained foetal membrane, lies on her brisket with the head characteristically turned into the flank over one shoulder or rested on the ground &eye blinking.

Stage3: lateral recumbency. Lose consciousness progressively to the point of coma, unresponsive to stimuli, severe bloat because of lateral recumbency and GIT atony, heart sound becomes inaudible and pulse may be undetectable.

Diagnosis:

- Clinical signs and history of animals (calving, lambing)
- Laboratory tests: total serum Ca, P and Mg determination (hypophosphatemia, hypermagnesemia)
- Favorable response to therapy of IV injections of calcium solutions.

Treatment: IV administration of calcium borogluconate slowly, within 30 minutes of treatment animal will stand and relief from bloat.

Prevention: -feeding diets low in Ca and normal to high phosphorus during late pregnancy

- Administration of Vit D_3 and Ca in the form of Ca gel at calving.

Fig. 4: Milk fever

B. **Ketosis in cattle/Acetonemia of cattle**

Definition: it is a disease of lactating cows characterized Clinically by loss of body weight, reduced milk yield, nervous signs (e.g. walking in circles, straddling or crossing of the legs, head-pushing, apparent blindness, aimless movements and wandering, vigorous licking of the skin and inanimate objects, depraved appetite and chewing movements with salivation), Laboratoricaly by ketonemia, ketonuria, hypoglycaemia, & ketone bodies in milk.

Etiology: ketosis is basically the result of a negative energy balance early in lactation. High milk production causes energy (glucose) drain and the need for energy exceeds the capacity. A deficit in digestion or metabolism may result in inadequate amounts of glucose (hypoglycemia) available at the cellular level. In an effort to correct this condition, body fat and limited protein stores are mobilized for gluconeogenesis in the liver with a parallel rise in ketone body formation. These ketone bodies have a toxic effect to the CNS if the level rises beyond the physiological limit. It occurs most commonly during the first month of lactation, less commonly in the second month, and only occasionally in late pregnancy. The highest frequency is between 20-30 days after calving

Clinical findings:

Wasting syndrome: - gradual decrease in milk yield and appetite, weight loss, depression, disinclination to move, ketone odour on breath or milk, ruminal movements decreased in amplitude and number.

Nervous syndrome: - circling, leg-crossing posture, head-pressing, blindness, aimless wandering, vigorous licking of self or fixed objects, depraved appetite, chewing movements with excessive salivation, in coordination, bellowing etc.

Diagnosis: based on clinical findings and history of lactation.

Treatment:

- IV injection of 500ml 50% glucose solution result in rapid improvement, however, relapse is common;

- IM administration of glucocorticoids; supportive treatment by oral administration of propylene glycol for 2 days or other glucose precursors to overcome relapse conditions must be included.

C. Hypomagnesaemia in cow/Lactating Tetany/Grass Tetany/Grass Staggers

Definition: It is a metabolic disease of cattle, horse, buffalo, sheep and goat characterized by hypomagnesaemia, and usually hypocalcaemia, and clinically by hyper aesthesia, in coordination, tonic-clonic muscular spasms, convulsions, and death due to respiratory failure.

- **Etiology:** a deficiency of magnesium in blood stream is the principal cause of hypomagnesic tetany. Factors affecting magnesium homeostasis:
- Tetanogenic pasture. Young, green grass has a lower content of available Mg than mature
- Ammonia formation. Excessive production of ammonia in the rumen from protein rich diet prevents, by a process of chelating the absorption of magnesium.
- Starvation
- Lactation. Considerable quantity of magnesium is excreted through milk during lactation

Clinical findings:

- **Acute:**
- Suddenly ceases to graze
- Unusual alertness and appear uncomfortable
- Staggering gait and fall down with obvious tetany of the limbs that is rapidly followed by clonic convulsions lasting for about a minute
- Temperature rises to 40-40.5^{o}C, high pulse and respiratory rates

Sub-acute:

- The onset is more gradual over a period of 3-4 days
- Slight in appetence
- Wildness of the facial expression
- Exaggerated limb movements

- Spasmodic urination and frequent defecation are characteristic

Diagnosis: in coordination, hyperesthesia and tetany are the major clinical abnormalities especially if they occur in ruminants exposed to grazing green cereal crops or lush grass-dominant pasture. Lactating animals are likely to be affected first.

Treatment: combined calcium-magnesium preparation (e.g. 500ml of a solution containing 25% Ca borogluconate and 5% Mg hypophosphite for cattle, 50ml for sheep IV followed by a subcutaneous injection of a concentrated solution of a magnesium salt

Control:

- Feeding of magnesium supplements, 120g magnesium oxide per day.
- Spraying with a 2% solution of magnesium sulfate at fortnightly intervals or by application of very finely ground magnesium oxide to the pasture (30kg/ha) before grazing commences.
- Feeding on hay and unimproved pasture.

D. Rumen acidosis

Ruminal acidosis is a nutritional disorder of ruminants generally resulting from ingestion of large amounts of feeds rich in readily fermentable carbohydrates, particularly when animals have not been gradually acclimated to those feeds. The disorder usually occurs in high-producing dairy cows. Subacute or subclinical ruminal acidosis (SARA) is considered to be one of the major threats to the welfare of lactating dairy cows and may affect up to 20% of cattle in early to mid-lactation. Subclinical rumen acidosis is defined as a condition where rumen fluid pH is below 6.0 while acute rumen acidosis is when rumen pH is below 5.5 associated with rumen motility that is weak or ceased.

Rumen acidosis classically occurs when an animal consumes the excess of grain. Fermentation of the high grain diet reduces rumen pH which can cause undesirable changes in microbial populations within the rumen. Rumen pH is lowered due to large quantities of volatile fatty acids and lactic acid produced during grain fermentation.

Lactic acid production is not the hallmark of rumen acidosis in dairy cows, as observed in beef feedlot cattle.

Low rumen pH can cause rumenitis, metabolic acidosis, lameness, hepatic abscesses formation, pneumonia, and even death. Reduced ruminal efficiency, liver and lung abscesses, and laminitis all can be related to SARA.

E. Laminitis

Laminitis and laminitis-related hoof problems (sole ulcer, white line abscess, solar hemorrhage, etc.) are one of the leading causes of lameness in cows. Laminitis has been associated with nutrition, and specifically with ruminal acidosis either in its acute or subacute form. Exact relationship between laminitis and SARA is not known. One of the theories states that damage of the ruminal epithelium induced by acidosis allows absorption of histamine and endotoxins into the blood. These and possibly other compounds affect circulation within the hoof and cause inflammation leading to the condition known as laminitis. Cows fed the higher level of crude protein may have increased incidence and duration of lameness. It is considered that products of degradation of protein excess in the rumen may be the causative agents for lameness.

Laminitis reduces profitability of the dairy herd. It is estimated that 15% of cows culled for slaughter are culled due to laminitis. In clinically lame cows, milk yield was reduced from 4 months before and for the 5 months after treatment. The total mean estimated reduction in milk yield per lactation was approximately 360 kg.

F. Retained placenta

Inadequate antioxidant status or “oxidative stress” of the cow contributes to a poorly functioning immune system and increases the risk of mastitis as well as retained placenta (retained fetal membranes, placental retention). Fetal membranes are retained if not expulsed longer than 12 hours after parturition. Se and vitamin E are important dietary antioxidants and their low levels in the diet are associated with a high incidence of mastitis and retained fetal membranes. Subsequently, addition of vitamin E or Se may improve antioxidant status and decrease the incidence of those diseases. The

similar effects can be obtained by addition of beta-carotene in the diet. Blood lymphocyte proliferation was higher in cows supplemented with beta-carotene, and phagocytic activity of blood neutrophils was enhanced as well as intracellular killing by blood neutrophils. Therefore, dietary beta-carotene can elevate blood beta-carotene and enhance peripartum host defense mechanisms by enhancing lymphocyte and phagocyte function.

Hypocalcaemia, among others, may be an important risk factor in the development of retained placenta. Muscle weakening or absence of uterine contractions in hypocalcemic animals does not contribute to the expulsion of fetal membranes. In cows with hypocalcaemia placental retention is 3.2 to 4 times more frequent than in normocalcemic cows. Hypocalcaemia also delay the physiological involution of uterus and increases the incidence of metritis. Moreover, hypocalcaemia is considered as one of the main causes of uterine prolapse, also due to loss of uterine muscles tone.

Cows with retained placenta were 3 times more likely to develop mastitis than animals without retained placenta. It has been reported that placental retention, metritis and mastitis predisposes dairy cows to foot problems. Moreover, uncomplicated ketosis, retained placenta, metritis, and hypocalcaemia at parturition are also risk factors for left displaced abomasums. Cows with retained placenta or metritis produce 0.3-2.3 kg/day less milk during subsequent lactation. In the case of retention alone, Guard (1996) stated that losses are on average 350 kg of milk annually.

Fig. 5: Retained fetal membrane

Self-check 5	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: write short answer

1. _____ is a metabolic disease occurring most commonly about the time of parturition in adult females and is characterized by hypocalcaemia (2 points)
2. List the diseases that related to nutritional factor (4 points)
3. List and describe some infectious diseases (2 points)

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

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

Information Sheet-6	Preventing entrance and disseminations of source of diseases to farm animals

6.1 Introduction

The control (i.e., reduction in the incidence and prevalence to a locally acceptable level), prevention (i.e., preventing entry) and/or eradication (i.e., total elimination) of diseases in animal and human populations require a thorough understanding of epidemiology. Veterinary epidemiology provides the tools to investigate disease outbreaks, identify risk factors for disease, investigate diseases of unknown etiology, undertake disease surveillance and monitoring, implement herd health programs, and develop and implement biosecurity measures. By manipulating the environment, such as by reducing fecal contamination, reducing overcrowding, or eliminating the carriers or vectors of pathogens, we can reduce disease. Similarly, by selecting animals that are resistant to disease or by increasing the resistance of the population through natural or artificial means, we can reduce the severity of disease and hence the disease's impact. To maintain a farm, region, or country free from disease, biosecurity is critical.

6.2 Preventing entrance and dissemination of any source of disease

Contact of livestock with neighboring or feral/wild animals of the same species has also been identified as a risk for disease entry. This risk can be minimized through barrier fencing and population control in the case of feral and wild animals. Secure perimeter fencing is particularly for intensive livestock industries to minimize the entry of other animals, people, and vehicles is considered essential.

People visiting livestock enterprises—including veterinarians, livestock advisors, inseminators, hoof-trimmers, and feed suppliers—are also a potential risk for disease introduction into a unit. To reduce this risk, only essential visitors should be allowed to visit the area/buildings where animals are housed, and protective clothing and footwear should be provided by the enterprise to these visitors. Such protective clothing and footwear should be provided for all workers and visitors, and should not be worn on any other unit or outside the enterprise. Similarly, visitors and workers should be required to shower-in and shower-out of enterprises in order to reduce the risk of disease introduction and escape from an enterprise.

Dead animals should be removed and disposed of by burning, burial, or composting to decrease the survival of pathogens and to avoid access by scavengers. Manure and used litter/bedding material should also be composted and disposed of to prevent access by other animals.

Contaminated feed and water can result in the introduction of diseases such as toxoplasmosis from contamination with *Toxoplasma gondii* cysts from cats, and ingestion of pasture contaminated with eggs of *Echinococcus spp*. is important in the infection of small ruminants. Ensuring that feed sheds and water sources are protected from vermin and other animals is essential in reducing these risks.

The introduction of equipment contaminated with feces and other animal products (e.g., hair, feathers, saliva) to a farm is also a potential disease introduction risk, with many studies highlighting the risk of the introduction of diseases, such as Newcastle disease, through the entry of contaminated equipment and fomites.

Workers on livestock enterprises should be discouraged or prevented from working at other livestock enterprises or from keeping similar livestock. Staff should also be discouraged from visiting other livestock units, animal markets, animal shows, and slaughterhouses, or if they do, should have no contact with animals on the employing enterprise for at least three days after such events

Disease control and prevention require a multifaceted approach with a thorough knowledge of the current disease situation in an enterprise, the likely disease threats, and how the risk of introduction can be minimized. Such an approach requires a sound knowledge of the discipline of veterinary epidemiology, with an understanding of disease transmission and spread, risk factors for disease, and methods to prevent disease. It is concluded that biosecurity is critical to ensuring the health and productivity of livestock.

In general the entrance and dissemination of microorganisms are prevented by:

- Only buy animals of known health status (both herd and individual animals) and control their introduction to the farm using quarantine if indicated
- Ensure animal transport on and off the farm does not introduce disease
- Monitor risks from adjoining land and neighbors and have secure Boundaries
- Where possible, limit access of people and wildlife to the farm
- Have a vermin control programme in place
- Only use clean equipment from a known source
- Use all chemicals and veterinary medicines as directed, etc.

Self-check 6	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: choose best answer (2 points)

1. One of the following is prevent entrance and dissemination of microorganisms
   A. Minimize the entry of other animals, people, and vehicles into the farm
   B. removed and disposed of by burning, burial of dead animal
   C. avoid contaminated feed and water
   D. all

Test II: write short answer

1. List and describe the method of prevention of entrance and dissemination of the diseases in and out of farm (4 points)

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

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

Information Sheet-7	Performing pre-selected and planed disease prevention and controlling activities

7.1 Introduction

The two fundamental components of animal disease emergency preparedness planning are the development of capabilities for:

- early warning, and
- early reaction to disease epidemics and other animal health emergencies.

These require advance preparation of both generic and disease-specific written contingency plans and operating procedures, the testing of such plans and training of staff; the development of capabilities at national, provincial and local veterinary headquarters, including field and laboratory services; development of mechanisms to involve other necessary government and private sector services and farming communities in the emergency response; development of the capacity to apply all the necessary resources to counter the disease or other animal health emergency in the most efficient way (including equipment, personnel and finances); and, finally, advance establishment of the appropriate legal and administrative structures to deal with an emergency. Surveillance is the primary key to effective disease management. Early detection enables early warning and an early reaction.

7.2 Performing pre-selected and planed disease prevention and controlling

7.2.1 Early detection

The key to success in handling animal disease epidemics is early detection. If a disease can be detected very early in the phase of epidemic development, the possibility exists that it can be arrested and eliminated before it actually inflicts damage. Early detection presupposes that there is a surveillance system in place that will bring infection to light when it is first seen. The country's veterinary authorities are then placed in the position of being able to manage the problem before it becomes uncontrollable, thus protecting the local livestock industry and ensuring food security for those closely dependent upon livestock. That is why this manual is all about surveillance. Early detection enables early warning and an early reaction. Surveillance is the primary key to effective disease management.

7.2.2 Surveillance

Surveillance plays an important role in the monitoring of progress in control and eradication programmemes. Its role is monitoring the spread of a disease in order to manage it effectively. Knowing how fast a disease is spreading, in which directions it is going and the size of the populations threatened are all key factors in resource mobilization. One needs to know how much vaccine to purchase, how many staff to deploy and where they should be deployed, the length of the cold chain that will be involved, and so on. Even when a disease is not present, but is the subject of regular vaccination campaigns (as in buffer zones), good surveillance will give a good idea of where to vaccinate and how many doses of vaccine to take along.

Surveillance is refers to all regular activities aimed at ascertaining the health status of a given population with the aim of early detection and control of animal diseases of importance to national economies, food security and trade".

Monitoring, on the other hand is a more specific activity/ies that will follow as part of an early reaction should surveillance activities indicate introduction of disease. It will focus more specifically on the identified disease in order to ascertain changes in prevalence level, rate and direction of spread. Monitoring can thus be defined as: "All activities aimed at detecting changes in the epidemiological parameters of a specified disease". The objectives of surveillance are:

- 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
- measurement of surveillance system performance

Establish priorities in surveillance:

- Identify the most important diseases in the country
- Identify priority areas
- International disease reporting.

- Define targets, as well as responsibilities.

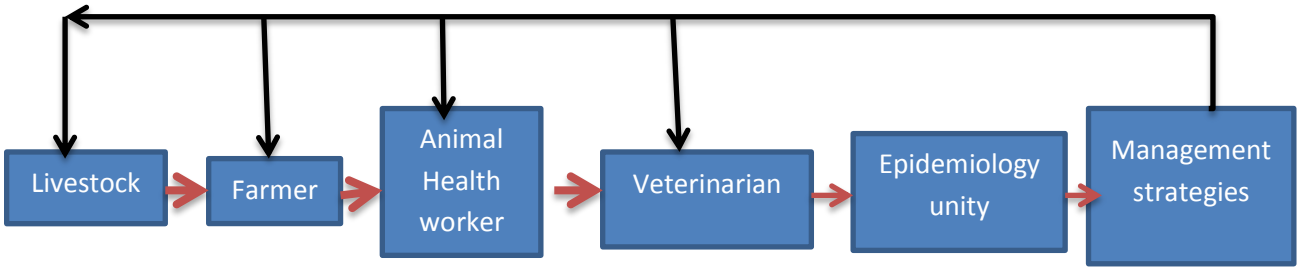

Fig. 6: Information flow in Surveillance and Livestock Disease Management

Self-check 7	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Say True or False (2 points)

1. The key to success in handling animal disease epidemics is early detection
2. Surveillance is the primary key to effective disease management

Test II: write short answer

1. _____is refers to all regular activities aimed at ascertaining the health status of a given population with the aim of early detection and control of animal diseases (3 points)
2. _____is a more specific activity/ies that will follow as part of an early reaction should surveillance activities indicate introduction of disease (3 points)
3. List the objectives of surveillance (4 points)

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

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

Information Sheet-8	Identifying health abnormalities of non-productive animals and giving recommendations

8.1 Abnormalities in non-productive animals

The abnormalities observed in non-productive animals in herd are characterized by poor production level and are listed as follow:

- Chronic mastitis
- Repeated breeding
- Lameness
- Chronic infectious diseases (e.g. tuberculosis, brucelossis, etc.)
- Nutritional deficiencies

8.2 Giving recommendations

In good cow Management the following ativities are recommended to improve production:

- Sound nutrition program, including minerals o Maintain cow body condition and a properly functioning immune system
- Minimize stress, particularly during handling
- Cull cows that are not reproductively sound and have chronic diseases
- Palpate for pregnancy
  - ✓ Pregnancy check via rectal palpation by a veterinarian can identify problems early and make diagnosis of problems more likely
- Raise or purchase only virgin heifers as replacement females
  - ✓ Purchasing open non-virgin females is a risk for Trichomoniasis and Campylobacter
  - ✓ Purchasing bred females is a risk for introducing BVD
- Synchronization is an important reproductive management tool for dairy cattle production, where the majority of animals are bred by artificial insemination. Estrus synchronization minimizes problems associated with estrus detection, such as labor costs and estrus detection errors.

Self-check 8	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: write short answer

1. List and describe the abnormalities of non-producing animals in farm (4 points)
2. Describe the suggestion and recommendation provided for non-productive animals (4 points)

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

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

Operation Sheet- Replacing uterine prolapse into its normal position

Materials: syringe, disinfectant, gauze, forceps, cotton, suturing material, anesthestetic agent, antibiotics, suture needle, bedding materials, bucket

Procedures

The following procedures are provided as a step-by-step for vaccination.

Step 1: Prepare materials and equipment

Step 2: Restrain animals properly

Step 3: wash the uterus by water and soap

Step 4: disinfect by disinfectant

Step 5: replace the uterus into its normal position by pulling it

Step 6: suture the opening of vulva

Step 7: inject antibiotics for secondary bacterial infection

LAP TEST	Performance Test

Name……. ID……..
Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **1** hour. The project is expected from each student to do it.

Task- Replace uterine prolapse into its normal position

LG #74	LO #4- **Record, Analyze and Store Herd Health and Production Information**

Instruction sheet

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

- Recording and analysing production and performance
- Recording and analysing herd health and production
- Recording and analysing cost of drugs, chemicals and health intervention
- Analysing and comparing records with the pre-set performance targets

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

- Record and analyse production and performance
- Record and analyse herd health and production
- Record and analyse cost of drugs, chemicals and health intervention
- Analyse and compare records with the pre-set performance targets

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 all 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 your performance is satisfactory proceed to the next learning guide,

Information Sheet-1	Recording and analysing production and performance

1.1 Introduction

Good farm management requires having a good useful set of farm records. Good records do not ensure the farm will be successful; however, success is unlikely without them. Farm records are like the report cards students receive at school. With a farm report card, farmers can tell how well they are managing their operation compared to other producers in their 'classes'. They can also see the strengths and weaknesses in their operation. Having accurate facts and figures is most useful when borrowing money, seeking government support and completing tax returns. From reliable farm records, equity (or proportion of total assets actually owned) can be updated to assist with future farm investment programs. Farm records can help evaluate the dairy enterprise on a mixed farm while farm advice will be more effective if the adviser knows exactly what is happening on the farm. Records and statements show what has occurred or is occurring on the farm while budgets predict what might happen in the future.

Production records are useful in measuring the performance of the animals and the herd. It contributes greatly to the economic appraisal of the enterprise. Production records are kept of: Animal products like eggs per hen per week and milk per cow per day in combination with milk quality data, and of animals which are slaughtered, in terms of for example weight, weaning age and weight, daily gain, production period, and how many animals e.g. per litter reached slaughtering.

Records provide the farm manager with data, information and knowledge. There are four uses for farm records:

- They are frequently used as a service tool. The types of services provided are income tax calculations, estate planning, business arrangement reconciliation and obtaining and managing credit.
- They can be used to provide data for financial analysis and other diagnostic instruments, such as identifying the strengths and weaknesses of the business.

- They can be used as an indicator of progress. A series of records are necessary to monitor progress.
- They are a good forward planning tool. Past records can be used to project future cash flows for current and modified farm management practices.

1.2 Livestock records to keep

1.2.1 Cattle farm production record

Excellent records are the cornerstone of building a financially successful beef/Dairy enterprise and they will be of great help in the development of the Beef/dairy husbandry and beef/dairy industry of any country. In summary, the importance of good record keeping includes:

Calving dates: to follow through different stages of each cow's lactation and to assess weight for age of young stock. Also to update annual livestock inventory as stock change classification. e.g. from calves to yearlings. They are also useful to identify cows that are due to be mated.

Daily milk yields: for closer animal observations if they suddenly and unexpectedly change. Daily herd milk yields, to check up on milk payments and to fine tune feeding programs.

Regular milk composition data: if provided by the cooperative or processor, to closely monitor the effects of diet.

Mastitis treatment: for individual cows and other treatments requiring milk not being sold. The drug withholding period must be followed to ensure milk quality is not compromised.

Routine monitoring of feed offered: (forages as well as concentrates) and actually consumed, which can indicate if cows are on heat or sub-clinically sick.

Live weight and body condition of adult cows: to monitor milking performance during the entire lactation and better plan fee

Live weight and body condition of young stock: to monitor feeding management required to achieve growth targets.

Dates when each cow is on heat: to manage artificial insemination (AI) programs as well as predict expected dates of calving.

Dates and results of pregnancy diagnoses: if undertaken, to predict expected calving dates.

Animal sickness, veterinary visits and drug treatment: to follow through animals' responses to treatment. With replacement heifers, it also provides a guide as to whether the heifer's lifetime productivity might be compromised.

Routine vaccination and drenching: to ensure they are timely and to plan future programs.

Stock purchases and sales of culls: to update livestock inventory.

Stock deaths and probable causes: to update livestock inventory and also monitor general herd health.

Age when culled: from the milking herd, reason for culling and number of lactations while in milking herd.

Milk and concentrate intakes of young calves: to plan weaning and calculate total rearing costs.

Yields of forage crops: to better utilize fertilizers and plan forage

1.2.2 Poultry Farm Production Records

Irrespective of the type and size of enterprises, the basic records to be maintained are as follows:

- ✓ Attendance and daily wages register
- ✓ Building Registers

- ✓ Equipment Register
- ✓ Feed and feed ingredient register
- ✓ Feed additives and medicines register
- ✓ Layer farm register
- ✓ Egg out turn register
- ✓ Broiler farm records
- ✓ Breeder farm records
- ✓ Hatchery records, etc.

Self-check 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. List type of production records maintained at: (6 points for each)
   a. Poultry farms
   b. Dairy farms
2. List the uses of farm records (4 points)

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

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

Information Sheet-2	Recording and analyzing herd health and production

2.1 Introduction

Disease and treatment records are necessary to keep track of the disease events in which each animal is involved during its lifetime. This can guide to better management practices by leading the attention to repeated events or certain vulnerable groups of animals over time (e.g. it can show how animals almost always need disease treatments during weaning). It provides information about the health status of each individual animal and the whole heard, and it can help ensuring important vaccinations given at the right time.

2.2 Recording abnormalities

Abnormalities due to disease records can for example involve:

- Lethargy
- Uncoordinated movements (Lameness)
- Behavioral change (depression or aggressive)
- Foaming and pathological lesion at the mouth (salivation)
- Multiple coughing animals, nasal discharges, Difficult, labored or rapid breathing
- Appetite loss, diarrhea, abdominal pain, weight loss, dehydration (sunken eyes, prolonged skin tent), etc.

Table 2: Abnormalities and treatment record sheet

Date	Cow no.	Sign of disease observed	Tentative DX	Sample taken	Sample results	Action taken	remarks
.	.	.	.	.		.	.
.	.	.	.	.		.	.
.	.	.	.	.		.	.

Table 3: Mastitis management and treatment record sheet

Farm code				1st RX		2nd RX		3rd RX		4th RX		
Cow no.	Quarter	Sample	Remarks	date		date		date		date		Sample results
				am	pm	am	pm	Am	pm	Am	pm	
.	.	.	.	.	.	.	.	.	.			
.	.	.	.	.	.	.	.	.	.			
.	.	.	.	.	.	.	.	.	.			

Self-check 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: choice best answer (3 point for each)

1. One of the following is abnormalities record in farm animals
   A. Lethargy
   B. Uncoordinated movements (Lameness)
   C. Behavioral change
   D. Foaming and pathological lesion at the mouth (salivation)
   E. All
2. Abnormalities records provides information about the health status of each individual animal and the whole herd
   A. True B. False

Test II: Write short answers

1. List some examples of abnormalities records performed in farm animals (4 points)

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

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

Information Sheet-3	Recording and analyzing cost of drugs, chemicals and health intervention

6.3 Introduction

On basis of the disease and treatment records, success of interventions both for prevention and treatment can also be evaluated. After treatment with dewormers, acaricides and antibiotics and other medicines, milk, eggs and meat cannot be eaten by humans for some time. The records are essential for keeping track of this, e.g. when this withdrawal time is over. In organic animal husbandry, the withdrawal time is normally longer than the ordinary withdrawal time (double, or three times).

6.4 Recording and treatment costs

Economic records are of paramount interest in providing the farmer with information concerning the profitability of his farm. Moreover they are of great help in decision making at the right time.

Table 4: Disease occurrence, treatment and treatment cost record sheet

Date	Animal no.	Kind of disease	Treatment	Treatment cost	Remarks
.	.	.	.		.
.	.	.	.		.
.	.	.	.		.

Table 5: Vaccination records for planned disease control

Date	Vaccination done	Type of vaccine and quantity	Cost of vaccine	Remarks
.	.	.		.
.	.	.		.
.	.	.		.
.	.	.		.

Table 6: Deworming records for planned disease control

Date	Deworming done	Type of drug and quantity	Cost of drug	Remarks
.	.	.		.
.	.	.		.
.	.	.		.

6.5 Analyzing cost of drug and chemical

There are three types of costs associated with medicines in a health care system: direct, indirect, and intangible. These three types of costs, when taken collectively, will give the most comprehensive assessment of actual medicine cost.

Direct costs are costs that are directly related to the resource use associated with a service or commodity in dealing with a health care intervention and include—

- Acquisition cost of the medicine (medicine price)
- Transportation (shipping and insurance)
- Supplies and equipment to administer the medicine
- Supply management (storage facilities, supply personnel)
- Medical and allied health consultations
- Costs of managing adverse effects of therapy
- Hospitalization costs related to adverse events or treatment effectiveness
- Laboratory services
- Outpatient visits
- Nonmedical costs such as travel costs, community assistance, and palliative care

Indirect costs are costs associated with lost production capacity and include—

- Time lost from work for the patient
- Time lost from work for the caregiver

Intangible costs are costs associated with pain and suffering, usually incorporated in the utilities assigned to health states that reflect quality of life.

Economic Evaluation Methods

Economic evaluation is about relating the cost of a service or program to the outcomes delivered. Usually, analysts are interested in comparing one health product or intervention with another. There are generally four technical types of economic evaluations:

- Cost minimization analysis (CMA) assumes that the effects of the two interventions being compared are equal and therefore compares costs.
- Cost effectiveness analysis (CEA) is used when the effects of the two interventions being compared are different (i.e., one intervention is superior to the other).
- Cost-utility analysis (CUA) is a special type of cost effectiveness analysis, in which the outcome is expressed as a utility measure (e.g., quality-adjusted life year).
- Cost-benefit analysis (CBA) is derived from transport economics; both costs and benefits are expressed in monetary terms.

Self-check 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Write short answers

1. Describe the cost benefit analysis of the cost of drug (3 points)
2. Describe the three type of costs of diseases of animals (3 points)

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

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

Information Sheet-4	Analyzing and comparing records with the pre-set performance targets

4.1 Introduction

Performance records should have flexibility and be helpful to both purebred and commercial cattle producers for comparing cattle within the same herd, breed, sex, age group and management group. Performance records are not designed for estimating differences between herds or between groups managed differently within a herd because environmental differences are likely to exist.

4.2 **Analyzing and comparing records with the pre-set performance targets**

Two types of performance testing programs are available to beef cattle breeders who may use them collectively to monitor each animal's performance from birth. The two types that should receive emphasis by cattle breeders are (1) cow herd performance testing and (2) on-farm bull testing.

When performance data are maintained, they can be a valuable aid in:

- measuring progress in herd improvement,
- evaluating performance of herd sires,
- culling poor producing cows,
- selecting replacement females,
- selecting bull calves for testing,
- selecting future herd sires and
- determining structural soundness under standardized conditions.

A good record keeping system helps take the guesswork out of management decisions. Farm managers who have high-quality records become more efficient and profitable; therefore, collecting good (i.e. complete, simple, appropriate and accurate) data is the key step to having the information you need to understand your farm performance better.

It is important for producers to identify what information is needed to support you in making management decisions. While collecting, maintaining, and analyzing records requires an investment in time, the ability to make decisions based on a known history of your particular farm is valuable. One way to truly assess the impact of management decisions is to have production records pre and post changes. By comparing against your operation's own history, you can identify the key factors that influence profit and concentrate on improving those areas.

Self-check 4	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Write short answers

1. What are the aids of performance recordings? (6 points)
2. What are the advantages of good recording system in farm animals? (4 points)

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

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

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