Dairy production

NTQF Level –II

Learning Guide-37

Unit of Competence: Identify common diseases of dairy animals

Module Title: Identifying common diseases of dairy animals

LG Code: **AGR DRP2 M10 L01 LG37**

TTLM Code: **AGR DRP2 TTLM 1219v1**

LO 1: Identify Hazard and risks

Instruction Sheet 1	Learning Guide 37

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

- Understanding OHS procedures
- Maintaining Personal hygiene and cleanliness standards OHS procedures
- Collecting and assessing Information regarding hazard identification and risk control
- Recognizing and reporting Hazards in the workplace

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

- Personal hygiene and cleanliness standards are maintained in accordance with occupational health and safety (OHS) procedures and organisational guidelines and procedures.
- Information regarding hazard identification and risk control is collected and assessed following the enterprise requirements.
- Hazards in the workplace are recognized and reported to the supervisor.
- Risks to self, bystanders, the public and animals are recognized and action is taken according to the enterprise guide lines.

Learning Instructions:

1. Read the specific objectives of this Learning Guide 47.
2. Follow the instructions described in number 1 to 6.
3. Read the information written in the “Information Sheet (**1, 2,3 and4**) in page **2,7,10 and 13** respectively
4. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
5. Accomplish the **“Self-check (1, 2, 3” and 4)** in page**, 6, 9, 12, and 15** respectively.

6. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1” **in page -23.**
7. Do the “LAP test” in page **24** (if you are ready). Request your teacher to evaluate your performance and outputs. Your teacher will give you feedback and the evaluation will be either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work.

Information sheet-1	Understanding OHS procedures

1.1. Hazards

Hazards in the workplace (e.g., uneven surfaces, confined spaces, heights), hazardous manual handling tasks, hazards associated with machinery, risks associated with plants and animals, risks associated with bystanders, plants, animal and the environment, levels of health and fitness, hazards for which personal protective clothing or equipment is required.

Hazards may include solar radiation, dust, noise air and soil borne microorganisms, fire hazards, chemicals and hazardous substances, sharp land tools and equipments, manual handling, holes and slippery and uneven surfaces.

A major feature of an OHS program will involve identification and assessment of workplace hazards.

1.2. Hazard identification

A hazard is anything with the potential to harm life, health or property. As hazards are the prime identifiable cause of occupational health and safety problems, controlling the risk arising from them offers managers the greatest area of opportunity for reducing injury and illness in the workplace.

Hazards arise from the workplace environment, the use of plant and substances in the workplace, poor work design, inappropriate management systems and procedures, and human behaviour. A set of procedures can be used in your organization to enable workplace hazards to be identified.

a. Safety audit

This is a systematic and periodic inspection of the workplace to evaluate the effectiveness of the organization's health and safety system. The audit may be conducted by a safety consultant or workplace OHS professionals such as safety officers. An audit usually contains a written report for management and is usually referred to any OHS committee.

b. Workplace inspections

These are regular inspections of the workplace by managers, supervisors and safety committee members to determine by observation what hazards exist in the workplace. Inspections involve consultation with supervisors and employees and a report to management and/or the safety committee.

c. Accident investigations

Many workplaces have a set of procedures for investigating and reporting on accidents (and near hits) to identify the hazards that contributed to the incident. Many accidents that involve "lost time" should be reported to the Work Cover Authority. Details of reporting requirements are on the Accident Report form which is available from all Work Cover offices.

d. Consultation

Employees are often more aware of hazards and the possible ways of controlling them, than management. Consulting employees can improve the assessment process as well as improving cooperation with control measures eventually put in place. If you have an OHS Committee, make sure it's accessible to everyone.

e. Injury and illness records

Work places are required to keep records of injuries and illness. Many work places also generate reports and statistics based on workers' compensation claims. These statistics can be analyzed to show the presence of hazards in the workplace Work Cover has adopted AS 1885.1 Workplace injury and disease recording standard as a Code of practice, giving advice on how to monitor and record workplace injury and illness.

f. Health and environmental monitoring

As with the OHS audits, monitoring may be done by OHS consultants or safety officers to provide technical advice about suspected problems.

Monitoring may show that a substance or process is a hazard and its severity. In this way, monitoring is associated both with hazard identification and workplace assessment and evaluation. A workplace hazard can also be brought to management's notice outside the routine investigating and reporting systems.

g. Complaints

Many workplace hazards are brought to the attention of a supervisor or manager through a complaint being made by an employee. Complaints should be taken seriously and passed to the appropriate person for prompt action, not left to create an industrial problem.

h. Observation

A supervisor, manager or OHS committee member, as part of his or her normal duties, may observe a workplace hazard. Part of the OHS program includes clearly defining who is responsible for the above activities and how the information is processed and analyzed.

1.3. Set up a training strategy

An organization's OHS training program should involve developing skills to enable all in the workplace to carry out their health and safety responsibilities.

OHS training does not just involve specific hazard training, OHS is part of all workplace training, just as OHS is an integral part of day-to-day management.

Health and safety should be included in:

- induction training
- supervisor and management training
- on-the-job training,
- specific hazard training
- work procedures and skills training
- emergency procedure training
- first aid training.

1.4. *Personal protection:*

Suitable personal protective equipment should be provided until such time as the risk is eliminated or minimized to a level that would not pose a threat to health prohibition of eating, chewing, drinking and smoking in contaminated areas

- provision of adequate facilities for washing, changing and storage of clothing, including arrangements for laundering contaminated clothing;
- use of signs and notices;

- Adequate arrangements in the event of an emergency Personal Protective Equipment
- Steel capped boots/shoes, overalls, gloves, sun hat, sunscreen lotion, safety goggles, face mask and ear protectors.

Standard precautions to prevent the spread of infection

Hand hygiene: hand washing with soap and water or use of an alcohol hand rub or gel. Cover wounds or skin lesions with waterproof dressings.

Use of personal protective equipment: disposable gloves and aprons and eye protection. Handle and dispose of sharps safely. Dispose of contaminated waste safely.

Managing blood and body fluids: spillages and collection and transport of specimens. Decontaminating equipment including cleaning, disinfection and sterilisation.

Maintaining a clean clinical environment. Prevention of occupational exposure to infection and managing sharps injuries and blood splash incidents.

Manage linen safely. Place patients with infections in appropriate accommodation.

Self-Check -1	Written Test

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

1. _____is anything with the potential to harm life, health or property (3pts)
2. What type of hazards may include in workplace? (5 points)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1. _____

_____

_____

_____

2. _____

_____

_____

_____

Information sheet-2	Maintaining Personal hygiene and cleanliness standards OHS procedures

It is the process of protecting the working environment from different hazardous thing which can cause risk on the society or workers and environment. To keep our work site in safe manner you should follow:

- ☞ Providing training to the worker and society
- ☞ Regular house keeping
- ☞ Periodic inspection of different hazards
- ☞ Maintenance of equipment

Preventing spread of infection: standard precautions

It is not always possible to identify people who may spread infection to others, therefore standard precautions to prevent the spread of infection must be followed at all times.

Hand washing

Hand washing is the single most important part of infection control. The technique should be used when washing with soap and water or when using an alcohol gel or rub. Hands should be washed before contact with contaminant equipment, after any activity that contaminates the hands, after removing protective clothing and gloves, after using the toilet and before handling food.

How to wash hands correctly and reduce infection

Wet hands, apply soap and use the following procedure

1. Rub palm to palm

2. Rub back of both hands

3. Rub palm to palm with fingers interlaced

4. Rub backs of fingers (interlocked)

5. Rub all parts of both hands

6. Rub both palms with finger tips

7. Rinse hands under running water and dry thoroughly on a clean towel.

This handwashing technique is based on procedure by G.A.J Ayliffe *et al. J.Clin. Path.* 1978; 31: 923. We would like to gratefully acknowledge ICI Pharmaceuticals UK for providing drawings.

Self-Check -2	Written Test

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

1. What should be consider to keep our work site in safe manner (4 points)
2. _____ is the single most important part of infection control (2 points)

   A. Control B. Washing C. Hand washing D. Handling

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1.

- _____

2.

- _____

Information sheet-3	Collecting and assessing Information regarding hazard identification and risk control

3.1. Hazard identification and risk control

Strategic approaches to reducing enterprise injury risk are multifaceted and include:

- Identifying elimination and substitution options
- Improving design and engineering solutions
- Administrative or work practice solutions, including education and skills development
- Identification of requirements for personal protective clothing and equipment
- Identification of incentives for adoption of improved systems
- Ensuring compliance with regulatory requirements for supply of safe plant and equipment and safe operation in the farm workplace.

3.2. Hazards in the workplace

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. The following hazards in farm dairies can be controlled through good design.

The words ‘risk’ and ‘hazard’ are often used interchangeably. However, if you are responsible for managing the health and safety in your workplace, it’s important that you understand the difference between them. The rest of this article focuses on hazards, including where they might be found in different workplaces. We also provide you with a range of further resources to make your risk assessment process as smooth as possible.

The six main categories of hazards are:

- **Biological.** Biological hazards include viruses, bacteria, insects, animals, etc., that can cause adverse health impacts. For example, mould, blood and other bodily fluids, harmful plants, sewage, dust and vermin.

- **Chemical.** Chemical hazards are hazardous substances that can cause harm. These hazards can result in both health and physical impacts, such as skin irritation, respiratory system irritation, blindness, corrosion and explosions.
- **Physical.** Physical hazards are environmental factors that can harm an employee without necessarily touching them, including heights, noise, radiation and pressure.
- **Safety.** These are hazards that create unsafe working conditions. For example, exposed wires or a damaged carpet might result in a tripping hazard. *These are sometimes included under the category of physical hazards.*
- **Ergonomic.** Ergonomic hazards are a result of physical factors that can result in musculoskeletal injuries. For example, a poor workstation setup in an office, poor posture and manual handling.
- **Psychosocial.** Psychosocial hazards include those that can have an adverse effect on an employee's mental health or wellbeing. For example, sexual harassment, victimisation, stress and workplace violence.

How to Manage Hazards in Your Workplace

If you neglect your responsibility to protect your employees, you could face financial and/or custodial penalties. Therefore, it's vital that you properly manage all your workplace hazards. This article should have helped you to identify and consider more obscure hazards, but it's important that you take further steps to protect you employees. For example, you should:

- **Carry out an appropriate risk assessment for the nature of the work and hazards.** We have provided some downloadable templates for you to use throughout this article. You can find more, including those that are relevant to your industry, by searching on the Hub.
- **Introduce appropriate control measures.** Once you have completed your risk assessment, you must introduce controls to reduce or eliminate the identified hazards. For example, you may be able to avoid work at height completely when

window cleaning by using extension poles or, if those are inappropriate, you could reduce the risks by installing fall prevention equipment.

- **Appropriately train all your employees in their duties.** All employees should have basic Level 1, Level 2, or Level 3 Health and Safety Training or Office Safety Training, in addition to training for any specific workplace hazards.

Self-Check -3	Written Test

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

1. What are the strategic approaches to reducing enterprise injury risk? (4 pts)
2. What are work place hazards (4pts.)
3. What are the six main categories of hazards (6pts)

Note: **Satisfactory rating – 14 points** **Unsatisfactory - below 14 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1.

- _____
- _____
- _____

2.

- _____
- _____

3.

- _____
- _____

Information sheet-4	Recognizing and reporting hazards in the workplace

4.1. Effluent as a liability

The management of animal manure represents a major health hazard on small holder farms, with the problem increasing with herd size, unless specific facilities are constructed. The problem is associated with several issues:

• Quantity and quality of faeces and urine produced
• Adequacy and frequency of removal
• Storage in proximity to shed
• Labor availability
• Methods of storage and disposal
• Value and use of manure
• Community concern about pollution (smell as well as contamination of ground water and water courses).

The human health hazards are becoming more serious than previously realized, due to inadequate supervisory and sanitary measures.

4.2. Feet problems

These can be caused the environment (continuous wet floors, uneven or broken cement), poor sanitation, infectious organisms or nutritional imbalances. With tethered cows, annual trimming can extend herd life by at least one year.

4.3. Bruised soles

Inside the hard, outer layer of the hoof wall and sole, there is a sensitive layer rich in blood vessels and nerves. If a cow stands on a stone, or some other small hard object, its sole bends upwards over the stone, severely squeezing the sensitive layer. This can cause bleeding within the claw, and subsequently pressure, pain and lameness.

4.4. Risks of zoonoses

Humans can catch the following diseases from cattle: acariasis, campylobacter, cryptosporidiosis, E. coli, leptospirosis, listeriosis, milkers' nodules, ringworm, salmonella and streptococcus.

You can be exposed to zoonotic diseases by:

- Getting animal blood, urine or feces splashed in your eyes, nose or mouth
- Having bugs enter your bloodstream through cracked skin or open cuts
- Breathing in dust or micro-organisms
- Eating or drinking infected animal products
- Being bitten by a fly, mosquito, tick or flea that has also bitten an infected animal
- Rats, possums and other pests bird droppings.

4.5. MANAGING THE HAZARD:

Avoid catching diseases from animals through good health and hygiene practices.

Run vaccination and parasite control programmes (especially for leptospirosis – refer to Guidelines for the Control of Occupationally Acquired Leptospirosis for more information).

- Teach workers about health and hygiene on dairy farms and supervise them.
- Hands should be covered, especially if there are cuts or other skin openings

Self-Check -4	Written Test

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

1. What are problems associated with hazards in workplace? (6pts)
2. How you expose to zoonotic diseases in workplace? (6pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1

- _____
- _____
- _____
- _____

2

- _____
- _____
- _____
- _____

Information sheet-5	Recognising and taking action of risks to self, bystanders, the public and animals

Five steps to risk assessment

Step 1: Identify hazards, i.e. anything that may cause harm.

Employers have a duty to assess the health and safety risks faced by their workers. Your employer must systematically check for possible physical, mental, chemical and biological hazards.

This is one common classification of hazards:

- Physical: e.g. lifting, awkward postures, slips and trips, noise, dust, machinery, computer equipment, etc.
- Mental: e.g. excess workload, long hours, working with high-need clients, bullying, etc. These are also called 'psychosocial' hazards, affecting mental health and occurring within working relationships.
- Chemical: e.g. asbestos, cleaning fluids, aerosols, etc.
- Biological: including tuberculosis, hepatitis and other infectious diseases faced by healthcare workers, home care staff and other healthcare professionals.

Step 2: Decide who may be harmed, and how.

Identifying who is at risk starts with your organisation's own full- and part-time employees. Employers must also assess risks faced by agency and contract staff, visitors, clients and other members of the public on their premises.

Employers must review work routines in all the different locations and situations where their staff are employed. For example:

- Home care supervisors must take due account of their client's personal safety in the home, and ensure safe working and lifting arrangements for their own home care staff.
- In a supermarket, hazards are found in the repetitive tasks at the checkout, in lifting loads, and in slips and trips from spillages and obstacles in the shop and storerooms. Staff face the risk of violence from customers and intruders, especially in the evenings.
- In call centers, workstation equipment (i.e. desk, screen, keyboard and chair) must be adjusted to suit each employee.

Employers have special duties towards the health and safety of young workers, disabled employees, night workers, shift workers, and pregnant or breastfeeding women.

Step 3: Assess the risks and take action.

This means employers must consider how likely it is that each hazard could cause harm. This will determine whether or not your employer should reduce the level of risk. Even after all precautions have been taken, some risk usually remains. Employers must decide for each remaining hazard whether the risk remains high, medium or low.

Step 4: Make a record of the findings.

Employers with five or more staff are required to record in writing the main findings of the risk assessment. This record should include details of any hazards noted in the risk assessment, and action taken to reduce or eliminate risk.

This record provides proof that the assessment was carried out, and is used as the basis for a later review of working practices. The risk assessment is a working document. You should be able to read it. It should not be locked away in a cupboard.

Step 5: Review the risk assessment.

A risk assessment must be kept under review in order to:

- ensure that agreed safe working practices continue to be applied (e.g. that management's safety instructions are respected by supervisors and line managers); and
- Take account of any new working practices, new machinery or more demanding work targets.

The best way to fix a hazard is to get rid of it all together. This is not always possible, but your employer should try to make hazards less dangerous by looking at the following options (in order from most effective to least effective):

- **Elimination** - Sometimes hazards - equipment, substances or work practices - can be avoided entirely. (e.g. Clean high windows from the ground with an extendable pole cleaner, rather than by climbing a ladder and risking a fall.)
- **Substitution** - Sometimes a less hazardous thing, substance or work practice can be used. (e.g. Use a non-toxic glue instead of a toxic glue.)
- **Isolation** - Separate the hazard from people, by marking the hazardous area, fitting screens or putting up safety barriers. (e.g. Welding screens can be used to isolate welding operations from other workers. Barriers and/or boundary lines can be used to separate areas where forklifts operate near pedestrians in the workplace.)
- **Safeguards** - Safeguards can be added by modifying tools or equipment, or fitting guards to machinery. These must never be removed or disabled by workers using the equipment.
- **Instructing workers in the safest way to do something** - This means developing and enforcing safe work procedures. Students on work experience must be given information and instruction and must follow agreed procedures to ensure their safety.
- **Using personal protective equipment and clothing (PPE)** - If risks remain after the options have been tried, it may be necessary to use equipment such as safety glasses, gloves, helmets and ear muffs. PPE can protect you from hazards associated with jobs such as handling chemicals or working in a noisy environment.

Sometimes, it will require more than one of the risk control measures above to effectively reduce exposure to hazards.

Table 1
Examples in which risk-analysis has contributed to the protection of animal and human health.

Hazard identified	Potential consequences	Risk assessment	Measures taken
Q-fever	Serious illness in humans	Medium risk	Vaccination, testing and culling of affected animals
Antibiotic (multi-) resistance	Emergence of untreatable illnesses	High risk	Antibiotic reduction strategy
Bacterial foodborne diseases (salmonellosis, campylobacteriosis, listeriosis)	Mild to serious illness in humans	Variable risk	Various control strategies
Products from vaccinated animals, vaccinated against a former OIE list A disease, for example classical swine fever	Spread of disease due to trade in animals with subclinical wild virus infections	Negligible risk	Discussion on implementing emergency vaccination instead of culling
Rift Valley fever, a mosquito borne zoonosis.	Serious illness in farm animals and humans	Low risk (for the Netherlands)	Mosquito surveillance in the Netherlands, control of identified imported exotic mosquitos
Crimean Congo haemorrhagic fever, a tick borne zoonosis	Serious illness in humans	Low risk (for the Netherlands)	Tick surveillance in the Netherlands
Malaria	Serious illness in humans	High risk through international air-travel	Fumigation of aircrafts, uptake of prophylactic medication by travellers

Self-Check -5	Written Test

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

1. What are the best way to fix a hazard? (6pts)
2. What are the five steps to risk assessment? (6pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1

- _____
- _____
- _____
- _____

2

- _____
- _____
- _____
- _____

Operation sheet # 1	Perform five steps to risk assessment

Steps to risk assessment

1. **Identify hazards, i.e. anything that may cause harm.**
2. **Decide who may be harmed, and how.**
3. **Assess the risks and take action**
4. **Make a record of the findings**
5. **Review the risk assessment**

Operation sheet # 2	Perform washing hand

Procedure of hand wash

- Rub palm to palm
- Rub back of both palm
- Rub palm to palm with figures interlaced
- Rub back of figures (interlocked)
- Rub all parts of both hands
- Rub both palms with finger tips

LAP Test-1	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 10min.

How to wash hands correctly and reduce infection

Task 1. Assessing risks

Task 2. Wash your hand

References

https://worksafe.govt.nz/topic-and-industry/agriculture/working-with-animals/staying-safe-in-and-around-farm-dairies/

John Moran. 2005. TROPICAL DAIRY FARMING: Feeding Management for Small Holder Dairy Farmers in the Humid Tropics. National Library of Australia Cataloguing-in-Publication entry. ISBN 0 643 09123 8.

https://worksmart.org.uk/health-advice/health-and-safety/hazards-and-risks/what-are-five-steps-risk-assessment

Dairy production

Level –II

Learning Guide-38

Unit of Competence: Identify common diseases of dairy animals

Module Title: Identifying common diseases of dairy animals

LG Code: AGR DRP2 M10 L02 LG38

TTLM Code: AGR DRP2 TTLM 1219v1

LO 2: Identify and handle non-infectious disease of cattle, shoats and camel

Instruction Sheet 1	Learning Guide 38

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

- Identifying common non-infectious diseases of cattle, shoats and camel.
- Animal health risks are identified for the occurrence of broad group of diseases or specific diseases
- Prevention and control methods for each of the diseases are identified and implemented according to the enterprise guideline.
- Identifying economic importance of the diseases and giving advice.

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

- Common non Infectious diseases of cattle, shoats and camel are identified based on their occurrence, clinical sign and symptoms and post mortem findings; and handled according to the national and organizational guideline.
- Animal health risks are identified for the occurrence of broad group of diseases or specific diseases
- Prevention and control methods for each of the diseases are identified and implemented according to the enterprise guideline.
- Economic importance of the diseases are identified and advice is given, and appropriate prevention and control programs are implemented as required under supervision.

Learning Instructions:

1. Read the specific objectives of this Learning Guide 49.
2. Follow the instructions described in number 1 to 6.
3. Read the information written in the “Information Sheet (**1, 2,3 and4**) in page 30**,41,44 and 49** respectively
4. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.

5. Accomplish the **"Self-check (1, 2, 3 and 4)** in page **40, 43, 48, and 50** respectively.
6. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1 and 2" **in page -51 and 52.**
7. Do the "LAP test" in page 53 (if you are ready). Request your teacher to evaluate your performance and outputs. Your teacher will give you feedback and the evaluation will be either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work.

Information sheet-1	Identifying common non-infectious diseases of cattle, shoats (sheep and goat) and camel.

1.1. Common non-infectious diseases of dairy animal

Non infectious diseases are not caused by virulent pathogens and are not communicable from one animal to another. They may be caused by hereditary factors or by the environment in which an animal lives. Many metabolic diseases are caused by an unsuitable alteration, sometimes brought about by man, in an animal's genetic constitution or in its environment. Metabolic diseases usually result from a disturbance in the normal balance of the physiological mechanisms that maintain stability, or homeostasis.

Metabolic diseases usually result from a disturbance in the normal balance of the physiological mechanisms that maintain stability, or homeostasis. Examples of metabolic diseases include overproduction or underproduction of hormones, which control specific body processes; nutritional deficiencies; poisoning from such agents as insecticides, fungicides, herbicides, fluorine, and poisonous plants; and inherited deficiencies in the ability to synthesize active forms of specific enzymes, which are the proteins that control the rates of chemical reactions in the body.

Excessive inbreeding (i.e., the mating of related animals) among all domesticated animal species has resulted in an increase in the number of metabolic diseases and an increase in the susceptibility of certain animals to infectious diseases.

1. Parturient Paresis in Cows (Milk fever, Hypocalcemia)

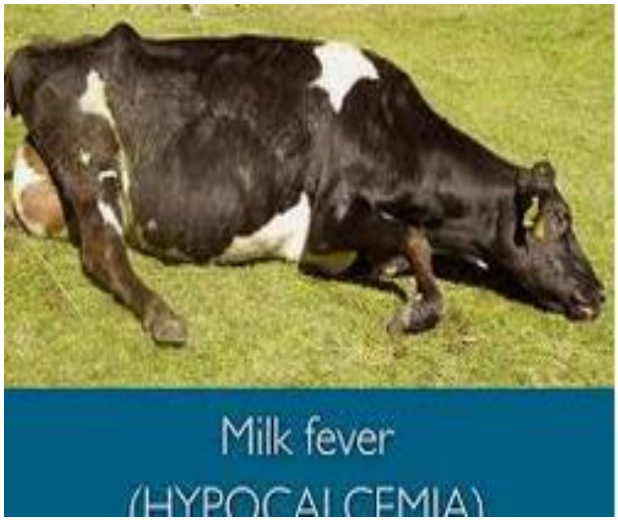
Ethology

Parturient paresis is an acute to peracute, afebrile, flaccid paralysis of mature dairy cows that occurs most commonly at or soon after parturition. It is manifest by changes in mentation, generalized paresis, and circulatory collapse.

Dairy cows will secrete 20–30 g of calcium in the production of colostrum and milk in the early stages of lactation. This secretion of calcium causes serum calcium levels to decline from a normal of 8.5–10 mg/dL to <7.5 mg/dL. The sudden decrease in serum calcium levels causes hyper excitability of the nervous system and reduced strength of muscle contractions, resulting in both tetany and paresis. Parturient paresis may be seen in cows of any age but is most common in high-producing dairy cows entering their third or later lactations. Incidence is higher in Channel Island breeds.

Clinical sign

Stage 1*,* animals are ambulatory but show signs of hypersensitivity and excitability. Cows may be mildly ataxic, have fine tremors over the flanks and triceps, and display ear twitching and head bobbing. Cows may appear restless, shuffling their rear feet and bellowing. If calcium therapy is not instituted, cows will likely progress to the second, more severe stage.



Stage 2 are unable to stand but can maintain sternal recumbency. Cows are obtunded, anorectic, and have a dry muzzle, subnormal body temperature, and cold extremities.

In stage 3, cows lose consciousness progressively to the point of coma.

Treatment is directed toward restoring normal serum calcium levels as soon as possible to avoid muscle and nerve damage and recumbency. Recommended treatment is IV injection of a calcium gluconate salt, although SC and IP routes are also used. A general rule for dosing is 1 g calcium/45 kg (100 lb) body wt. Most solutions are available in single-dose, 500-mL bottles that contain 8–11 g of calcium. In large.

2. Hypomagnesemic Tetany in Cattle and Sheep (Grass tetany, Grass staggers)

Hypomagnesaemia tetany is a complex metabolic disturbance characterized by hypomagnesemia (plasma tMg <1.5 mg/dL [<0.65 mmol/L]) and a reduced concentration of tMg in the CSF (<1.0 mg/dL [0.4 mmol/L]), which lead to hyperexcitability, muscular

spasms, convulsions, respiratory distress, collapse, and death. Adult lactating animals are most susceptible because of the loss of Mg in milk

Ethology

The disorder occurs after a decrease in plasma Mg concentration when absorption of dietary Mg is unable to meet the requirements for maintenance (3 mg/kg body wt) and lactation (120 mg/kg milk). This can arise after a reduction in food intake during inclement weather, transport, or when cows graze short-grass dominant pastures containing <0.2% Mg on a dry-matter basis.

Clinical finding

In the most acute form, affected cows, which may appear to be grazing normally, suddenly throw up their heads, bellow, gallop in a blind frenzy, fall, and exhibit severe paddling convulsions. These convulsive episodes may be repeated at short intervals, and death usually occurs within a few hours.

Treatment

Animals showing clinical signs require treatment immediately with combined solutions of calcium and Mg, preferably given slowly IV while monitoring the heart

3. Acetonaemia (Ketosis) of Dairy Cows

Very distinct problem for dairy cows is the disease of ketosis (or acetonaemia). The occurrence of this disease in dairy cows is related to an increased demand for glucose by the animal. Ketosis also occurs in other animals and the problem is known by various names, eg, pregnancy toxaemia in ewes.

Most commonly, ketosis is seen either in high producing cows or cows on a poor diet. Signs of the disease can be seen before calving, but they occur most commonly in the first month after calving and occasionally in the second month. In a herd, ketosis can either be sporadic with only individuals affected, or endemic with many cows affected over a period.

The disease is an extension of a normal metabolic process that occurs in most heavily producing dairy cows. The basic problem in ketosis is a deficiency of glucose (or sugar) in the blood and body tissues.

Signs

The two major forms of ketosis occurring in dairy cattle are the wasting and nervous forms. The wasting form is much more common.

1) Wasting form of ketosis
2) Nervous form of ketosis

Treatment

The initial aim of treatment is to restore the lack of glucose in the body. A quick-acting glucose supplement is required immediately. Follow-up treatment is aimed at providing a long term supply of glucose.

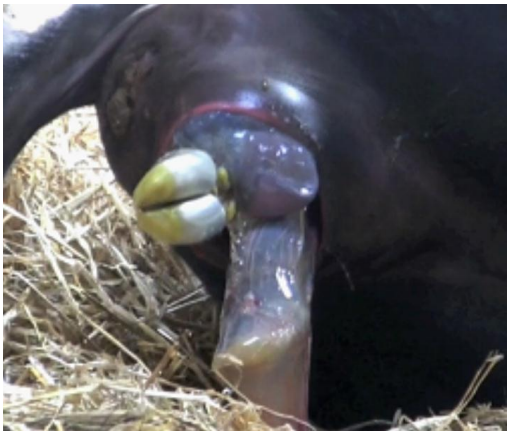
4. Dystocia

Incomplete cervical dilation occurs very occasionally in heifers but the true incidence is difficult to determine because in most situations the onset of first stage labour has not been noted.

Recognizing the signs of calving: The normal calving process is classified into three stages, and recognizing the stages is critical for a successful outcome (for the dam and the calf).

- **Stage I**: is characterized by dilation of the birth canal and cervix, and initiation of uterine contraction. Usually, the cow/heifer is off-feed and appears restless. This stage lasts for approximately 2 to 6 hours in mature cows, but it may be longer in heifers.

- **Stage II**: is characterized by the appearance of the amniotic sac (or water bag), uterine and abdominal contractions are evident, and this stage ends with the expulsion of the calf (or calves). This stage lasts for approximately 2 hours in cows and up to 4 hours in first calving heifers. It is critical that good progress is observed during this stage to determine whether an intervention is required. If there is abdominal contraction but no calving progress after 1 hour of the water bag appearance, intervention is required.
- **Stage III**: is characterized by the expulsion of the fetal membranes (placenta). Usually, the fetal membranes are expelled within 3 hours of delivery. If the fetal membranes are not expelled within 8 to 12 hours post-calving, treatment might be needed.



Guidelines for calving assistance:

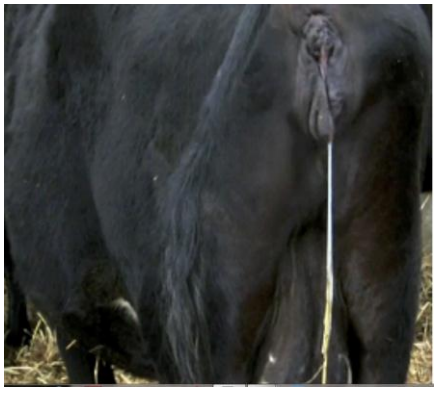
- Hygiene should be a top priority. Wash the perennial region with soap and water, and use obstetrical lubricant and long sleeves.
- Check the size of the fetus in relation to the size of the birth canal (dam). Call your veterinarian if there is no progress within 30 minutes after your intervention.
- Use clean and sanitized obstetric chains (free of debris/dirt) and correct any malpresentation and/or malposition before pulling.
- For first calving heifers, once the nose/feet of the calf are out: help finish.
- For backward presentation: help out.
- Have written calving protocols for your dairy personnel (e.i., frequency of observations, when/how it is appropriate to intervene, etc.)

Treatment

Manual pressure applied for 10 to 15 minutes may gradually dilate the cervix in some cases but such cases may well represent those heifers disturbed during early first stage labour. In some cases the vulva may also fail to dilate properly because there has been no pressure from the water bag and veterinary attention is necessary. Natural dilation is achieved by pressure from an intact water bag being pressed through the cervix into the vagina by contractions of the uterus. For this reason it is unwise to manually rupture the water bag until full dilation is complete.

5. Retain foetal membrane (retain placenta)

The placenta is the membrane that connects the fetus with the dam. The button like structures of the placenta (cotyledons), connect with the caruncles of the uterus. It is through these unions (placentomas), that nutrients are transferred from the mother to the calf. After a normal calving, the placenta will be expelled within 30 minutes to 8 hours. If the placenta has not been released after 12 hours, the cow will have a condition known as retained placenta (RP).



Several factors have been associated with increased risk of RP. The most important are listed below:

- Mechanical factors: difficult birth (dystocia), twins, stillborn, abortion.
- Nutritional factors: mineral and vitamin deficiency, low levels of calcium in blood.
- Management factors: stress, obesity.
- Infectious diseases: Brucellosis, Leptospirosis, IBR, BVD

Treating cows immediately after calving with oxytocin, prostaglandin or calcium has shown poor results on RP prevention. However, once the cow has RP, there is something very important that you can do:

Prevent Metritis (Uterine Infection). Remember, clean and comfortable bedding is critical to ensure minimal bacterial contamination of the placenta and the uterus.

Manual removal of the placenta is not advised. Postpartum, the uterine walls are thin and fragile, and manipulation of the uterus may cause harm. Trimming out the placenta may decrease the dirt caught by the placenta, however, the pulling force of the placenta's weight will be lost. Retained placenta ends up in metritis in 25 percent to 50 percent of cases. Metritis may require antibiotic treatment and rehydration; you should seek advice from your veterinarian to establish a metritis treatment protocol.

Cows with RP normally drop the placenta within a week. The best approach in a RP case is to watch the cow closely. It is very important to remember that if she is not sick - do not treat, and if she is sick, seek advice from your veterinarian.

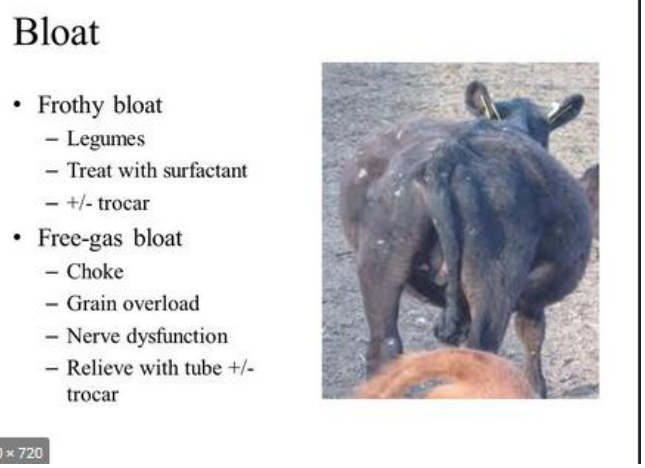
6. Bloating

Bloat is simply the buildup of gas in the rumen. This gas is produced as part of the normal process of digestion, and is normally lost by belching (eructation). Bloat occurs when this loss of gas is prevented.

There are two sorts of bloat.

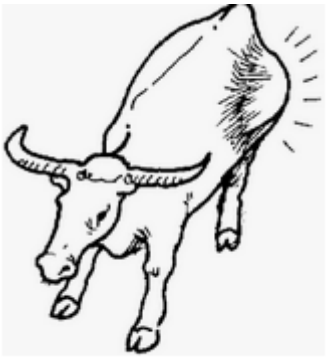
- The least common type is gassy bloat, which occurs when the gullet is obstructed (often by foreign objects such as potatoes) or when the animal can't burp (such as with milk fever or tetanus).
- The second type of bloat is frothy bloat, which happens as the result of a stable foam developing on top of the rumen liquid, which blocks the release of the gas. This is by far the most common form of bloat, and unlike gassy bloat, it is highly seasonal with peaks in the spring and autumn. This is because the foam is formed by breakdown products from rapidly growing forages (particularly legumes such as clover and alfalfa).

These increase the viscosity (stickiness) of the rumen fluid and prevent the small bubbles of gas formed by rumen fermentation from coming together to form free gas that can be belched off



Clinical Signs

- Distended left abdomen is the most obvious sign
- Usually associated with pain, discomfort, and bellowing.
- Death can occur within 15 minutes after the development of bloat
- Gaseous bloat is usually seen in one or two animals. Frothy bloat can affect up to 25% of cases
- In some cases sudden death may be the first sign seen by the stockman, although in such cases it is likely that there will be other cattle with bloat that are still alive



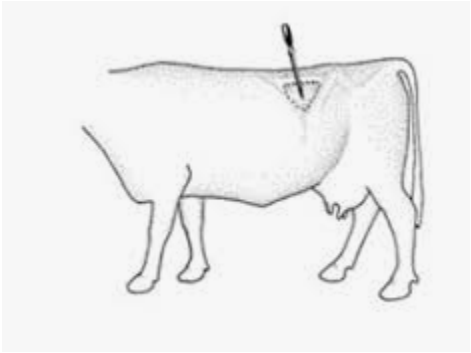
Bloat

Diagnosis

- On the clinical signs described above
- History of access to lush pasture
- Passing a stomach tube will distinguish between gassy and frothy bloat. If it's gassy bloat a stomach tube passed into the rumen will allow the gas build-up to escape through the tube. No such gas is seen in frothy bloat.

Treatment

- Passing a stomach tube is the best treatment for gassy bloat. Once the gas has been released, the cause of the obstruction should be looked for.
- In a few cases a trochar and cannula punched through the side into the rumen will relieve gassy bloat when a stomach tube has not worked. But such cases are rare, and as the trochar provides a tremendous opportunity for introduction of infection, it should only be used as a last resort.



- For frothy bloat, antifoaming agents that disperse the foam should be given by stomach tube. Old-fashioned remedies such as linseed oil and turpentine are effective but newer treatments such as dimethicone or polaxolene are easier to give as the effective dose is much smaller.
- If an outbreak of frothy bloat occurs all cattle on that pasture should be removed immediately and put onto a high fibre diet (hay or straw), and any cows showing bloating signs treated with an anti-foaming agent. The pasture should not be grazed for at least ten days.

7. Left or Right Displaced Abomasum and Abomasal Volvulus

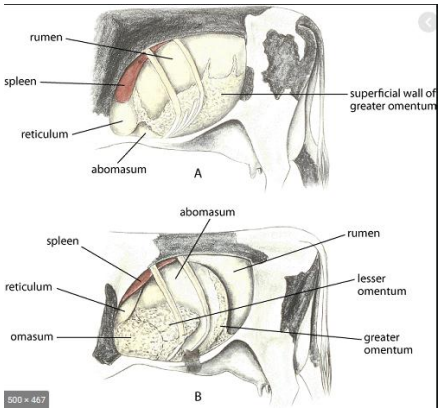
The abomasum is suspended loosely by the greater omentum(peritoneum fold) and lesser omentum, it can be moved from its normal position on the right ventral part of the abdomen to the left or right side (LDA, RDA), or it can rotate on its mesenteric axis while displaced to the right and lateral to the liver (AV).

The abomasum can shift from its normal position to left displacement or to right displacement over a relatively short period. AV can develop rapidly or slowly from an uncorrected RDA

Clinical finding

The typical history of abomasal displacement includes anorexia (most commonly a lack of appetite for grain with a decreased or normal appetite for roughage) and decreased

milk production (usually significant but not as dramatic as with traumatic reticuloperitonitis or other causes of peritonitis). In AV, anorexia is complete, milk production is more markedly and progressively reduced, and clinical deterioration is rapid. in abomasum displacement, temperature, heart rate, and respiratory rate are usually normal.



Treatment

Open (surgical) and closed (percutaneous) techniques can be used to correct abomasal displacements. Rolling a cow through a 180° arc after casting her on her right side corrects most LDAs; however, recurrence is very likely. LDA can be corrected surgically using right flank pyloric omentopexy, right paramedian abomasopexy, left paralumbar abomasopexy, combined left flank and right paramedian laparoscopy (two-step procedure), or left flank laparoscopy (one-step procedure). Blind suture techniques (toggle-pin fixation or the “big needle” [blind-stitch] method), performed in the right paramedian area, are percutaneous methods for correction of LDA; however, the exact location of the suture is not known.

Self-Check -1	Written Test

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

1. What are the two stages hypocalcaemia disease? (4pts)
2. What are the two major forms of ketosis occurs in dairy cattle? (3pts)
3. What are the most important several factors have been associated with increased risk of RP? (6pts)

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

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

Answer Sheet

Name: _____ Date _____

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Information sheet-2	Identifying animal health risks

2.1. Risk factor of nutritional imbalance

Nutritional imbalances, deficiencies, or erratic management of feeding programs for dairy cows can create large numbers and various types of health problems generally categorized as metabolic diseases.

Compounding the problem are the ever-changing nutritional needs of the cow, her lactation/dry period needs, feed quality changes, and producer personal management practices.

Herd health programs as recommended by the veterinarian must include a way to avoid metabolic disorders and prevent or control infectious disease.

Frequently when metabolic disease increases, opportunistic infectious disease also increases. Stress from metabolic problems may decrease the cow's resistance and compromise immune system function.

If these diseases are not prevented, very costly consequences in the reproductive, milk production and human resource areas will occur. In some herds there have been death losses of up to 20-25 percent reported over a year's time, in addition to other related costs, as a result of these disease implications.

2.2. Impact or risk of Animal Diseases

Animal diseases can have a large impact on an area. Some of the repercussions are:

- Damage to local agricultural economy.
- Mass cull / disposal of animal carcasses.
- Loss of livelihoods for farmers and farm workers.
- Health risks to farm workers.

Consequences of Animal Diseases

Some of the consequences of animal diseases are:

- Long term psychological health impacts to farmers.

- Increased food costs to consumers.
- Knock on effect on tourism and other service industries, such as catering.
- Damage to businesses that can never be repaired.

Self-Check -2	Written Test

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

1. List some of consequences of animal disease risk animal farm? (5pts)
2. What are the impacts or risks of animal disease in dairy farm? (5pts)

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

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

Answer Sheet

Name: _____ Date _____

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Information sheet-3	Identifying and implementing prevention and control methods for each disease

3.1. Prevention and control methods of non-infectious disease

1. Management/Prevention/Control measures of dystocia

In the hours leading up to calving, there is often little anyone can do to prevent dystocia from occurring. However, looking back on your management decisions from the past the breeding season and fall, may give one insight into how calving will go. Here are some example areas to evaluate before calving starts:

- **Calving Ease Direct EPD (CED)**

  Utilize calving ease bulls when mating to heifers, young or small cows that may have trouble calving.

- **Pelvic Measure**

  Measuring pelvic area in replacement or bred heifers before their first calving event will give producers an idea of which females may have trouble due to abnormal pelvis shape or size

- **Body Condition Score**

  Pay attention to heifers and cows that are carrying extreme amounts of fat or are very thin. Over conditioned heifers are more likely to have troubles calving due to accumulation of fat in the pelvis hindering fetal passage through the birth canal.

2. Management/Prevention/Control measures of retained placenta

Too early/frequent human interference may delay normal progression of first stage labour especially in heifers. Farmers should be encouraged to leave cattle undisturbed for four hours after the appearance of a mucus string or allanto-chorion at the vulva, especially in

heifers. However, frequent bouts of powerful abdominal contractions occurring more frequently than every five minutes or so must be investigated.

The control of retained placenta needs to focus on the control of causative factors like abortions, premature calving, calving difficulties, and vitamin and mineral deficiencies. Milk fever, even in its subclinical form needs to be controlled. Milk fever and even sub-clinical calcium deficiency can be associated with an increased risk of RFM with older cows more at risk of lower blood calcium. Good control of feeding and condition during the dry period and avoiding cows becoming overfat, will also reduce the incidence of retained afterbirth.

3. Prevention of frothy bloating

It is much more effective to prevent bloat than treat affected animals. Management and planning can significantly reduce the number of cases. To prevent frothy bloat: 1)

1. If possible avoid using high-risk pastures at high-risk times. Pastures with a history of bloat problems or with a high clover content should not be used for cows soon after turnout.
2. Stagger turnout with buffer feeding as this will allow the rumen to adapt to the new diet. In particular try and keep up fibre intakes at risk periods.
3. If you have to use high-risk pastures, introduce the cattle to them slowly. In some cases restricting access to as little as ten minutes per day at the start may be necessary to prevent bloat.
4. Avoid starting to graze high-risk pastures when they are wet.
5. Administer anti-foaming agents daily if bloat is a severe problem. If this is the case and you can strip graze then spraying antifoaming oils (emulsified with water) onto the grass can significantly reduce labour costs.
6. Remove high-risk animals. Some animals have recurrent bloat despite prevention and treatment

Type of forage, weather, time of day, mineral nutrition, animal characteristics (adapted to feeds/forages), and rumen conditions all influence the likelihood of animals bloating.

Alfalfa, forage rape, wheat, and many clovers (including white, ladino, sweet, and red) cause bloat more than grasses or other commonly grazed forages. Some animals, more selective in their grazing, may consume a diet higher in bloat-causing plants than other animals.

Cooler than normal temperatures (especially at night) are usually associated with bloat. Reasons may include higher forage intake by animals during cool weather and that plants initially are digested more rapidly when grown at lower temperatures. Cattle also tend to bloat more frequently in the morning, possibly because their biggest meal occurs at this time.

You can reduce bloating by feeding purchased anti-bloating supplements, but this can be expensive. Often, proper grazing management can reduce or eliminate bloat problems as effectively as purchased supplements. Proper grazing management techniques involve providing a consistent and steady diet and controlling access to high bloat-potential plants, especially under moist or succulent conditions.

4. Prevention of Displace Abomasum

The incidence of abomasal displacements can be decreased by ensuring a rapid increase in rumen volume after calving, feeding a total mixed ration rather than feeding grain twice daily (“slug feeding”), avoiding rapid dietary changes, maintaining adequate roughage in the diet, avoiding postparturient hypocalcemia, and minimizing and promptly treating concurrent disease and ketosis

5. Prevention of Hypocalcaemia

Historically, prevention of parturient paresis has been approached by feeding low-calcium diets during the dry period. The negative calcium balance results in a minor decline in blood calcium concentrations. This stimulates PTH secretion, which in turn stimulates bone resorption and renal production of 1,25 dihydroxyvitamin D. Increased 1,25 dihydroxyvitamin D increases bone calcium release and increases the efficiency of intestinal calcium absorption. Although mobilization of calcium is enhanced, it is now known that feeding low-calcium diets is not as effective as initially believed. Furthermore,

on most dairy farms today, it is difficult to formulate diets low enough in calcium (<20 g absorbed calcium/cow/day), although the use of dietary straw and calcium-binding agents such as zeolite or vegetable oil may make this approach more useful.

Self-Check -3	Written Test

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

1. What are the prevention methods of bloating? (6pts)
2. What is the main prevention method of hypocalcaemia? (6 pts)

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

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

Answer Sheet

Name: _____ Date _____

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Information sheet-4	Identifying economic importance of the diseases and giving advice

4.4. Economic importance of disease

Disease may cause economic loss in feedlots through mortality, treatment cost, or effects on productivity. The impact of clinical and subclinical disease on production efficiency and economic returns may be greater than the losses associated with mortality.

A thorough understanding of the impact of disease on animal performance and economic loss is essential to make cost-effective recommendations to feedlot managers. The costs associated with death loss, chronically ill cattle marketed prematurely at a discount, and treatment are obvious and easy to calculate. Hidden costs, such as reduced performance and lower carcass quality, are often overlooked.

Treatment costs are another source of economic loss. Factors influencing the average cost include the morbidity rate, retreatment rate, cost of the drug(s), combination versus single antimicrobial therapy, whether adjunct therapy is used, labor, and feedlot markup on the products used.

The morbidity rate has the strongest influence on the average treatment cost for all cattle in the pen. When metaphylaxis is used to manage bovine respiratory tract disease, it must be added to the total medical cost for the pen.

Self-Check -4	Written Test

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

1. _____ has the strongest influence on the average treatment cost for all cattle in the pen. (4pts)
2. How can be disease cause economic loss in feedlot through? (6pts)

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

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

Answer Sheet

Name: _____ Date _____

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Operation sheet # 1	Perform calving assistance

Calving assistance:

- Making hygiene a top priority.
- Check the size of the fetus in relation to the size of the birth canal (dam).
- Use clean and sanitized obstetric chains (free of debris/dirt) and correct any malpresentation and/or malposition before pulling.
- For first calving heifers, once the nose/feet of the calf are out: help finish.
- Have written calving protocols for your dairy personnel (e.i., frequency of observations, when/how it is appropriate to intervene, etc.)

Operation sheet # 2	Perform prevention of frothy bloating

Prevention of frothy bloat

6. avoid using high-risk pastures at high-risk times
7. Stagger turnout with buffer feeding as this will allow the rumen to adapt to the new diet.
8. Introduce the cattle to pasture slowly
9. Avoid starting to graze high-risk pastures when they are wet.
10. Administer anti-foaming agents daily if bloat is a severe problem.
11. Remove high-risk animals.
12. Some animals have recurrent bloat despite prevention and treatment

LAP Test-1	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 10min.

Depending upon the disease status of your animals, you may have to practice the following

Task 1: **Assesse Calving**

References

https://www.msdvetmanual.com/metabolic-disorders/disorders-of-magnesium-metabolism/hypomagnesemic-tetany-in-cattle-and-sheep

http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/animal-diseases/beef-and-dairy-cows/acetonaemia-ketosis-of-dairy-cows

https://dairy.osu.edu/newsletter/buckeye-dairy-news/volume-12-issue-1/bovine-calving-management-impact-dystocia-dairy

https://www.thecattlesite.com/diseaseinfo/199/bloat-in-cattle/

https://www.msdvetmanual.com/digestive-system/diseases-of-the-abomasum/left-or-right-displaced-abomasum-and-abomasal-volvulus?query=displaced%20abomasum

https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1198&context=extensionhist

https://www.drovers.com/article/preventing-dystocia-calving-season-starts

https://www.britannica.com/science/animal-disease/Survey-of-animal-diseases#ref63291

Dairy production

Level –II

Learning Guide# 39

Unit of Competence: Identify common diseases of dairy animals

Module Title: Identifying common diseases of dairy animals

LG Code: **AGR DRP2 M10 L03 LG39**

TTLM Code: **AGR DRP2 TTLM 1219v1**

LO 3: Identify and handle infectious disease of cattle, shoats and camel

Instruction Sheet 1	Learning Guide 39

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

- Identifying Common Infectious diseases of cattle, shoats and camel caused by micro organisms
- Using treatments in the routine preventative health care of infectious animal disease
- identifying and implementing prevention and control methods for each of the diseases
- Identifying Public and economic importance of the diseases and giving advice.

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

- Common Infectious diseases of cattle, shoats and camel caused by micro-organisms are identified based on their occurrence, clinical sign and symptoms, mode of transmission and post mortem findings; and are handled according to the organizational guideline.
- Animal health risks are identified for the occurrence of broad group of diseases or specific diseases are identified
- Prevention and control methods for each of the diseases are identified and implemented according to the enterprise guideline.
- Public and economic importance of the diseases are identified and advice is given and appropriate prevention and control programs are implemented as required under supervision of a veterinarian.

Learning Instructions:

8. Read the specific objectives of this Learning Guide 48.
9. Follow the instructions described in number 1 to 6.
10. Read the information written in the “Information Sheet (**1, 2,3 and4**) in page 58**,71,74 and 83** respectively

11. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
12. Accomplish the **"Self-check (1, 2, 3 and 4)** in page **70, 73, 82, and 84** respectively.
13. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1" **in page -85.**
14. Do the "LAP test" in page __ (if you are ready). Request your teacher to evaluate your performance and outputs. Your teacher will give you feedback and the evaluation will be either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work.

Information sheet-1	Identifying Common Infectious diseases of cattle, shoats and camel caused by micro organisms

1.1. Common diseases in dairy animals

Disease has been broadly defined as any condition in which there is a deviation from health or normal functioning of any or all the tissues and organs of the animal body. Most of the diseases are caused by pathogenic bacteria, viruses and parasites. A pathogenic organism is one which will always produce disease in the animal body under natural or experimental conditions.

1. Common infectious diseases of Cattle

1) Diseases caused by bacteria-
   Anthrax, black quarter, brucellosis, mastitis, Haemorrhagic septicemia, calf scours, pneumonia.
2) Diseases caused by viruses- Foot and Mouth, pox, LSD, Rinderpest.
3) Diseases caused by protozoan organisms- Coccidiosis, Babesiosis, Anaplasmosis, Theileriosis, Trypanosomiasis, Trichomonads.
4) Diseases caused by parasites **–** Round worms (Nematodes), Tapeworms (Cestodes), Liver flukes (Trematodes).

1.2. Bacterial diseases

1.2.1. Anthrax (Splenic fever)

The causative agent is Bacillus anthracis. The mode of infection is by ingestion and infection from infected pasture, water, feed and fodder, and biting of insect vectors. Incubation period is 1 to 5 days. The symptoms vary according to the severity of the attack and to the species affected. The disease may occur in per-acute, acute, sub-acute or chronic form. The disease is characterized by sudden onset of symptoms and death.

Foamy blood from nose and mouth is expelled and sudden death results. In acute form there is sudden rise in temperature (105°F to 108°F) , abortion in cows, bloody discharge from the mouth and nostril, blood stained diarrhoea, straining during defecation and in sub-acute form the animals die in 3 to 5 days or longer or effect complete recovery. In Chronic form the local lesions confined to the throat, swelling occur occasionally in cattle. Diagnosis is by clinical signs and confirmed by laboratory examination. No post- mortem should be done because opening or skinning the carcass result in spreading the infection.

Treatment and control Penicillin should be given to treat the infection

(a) A Strict quarantine of the infected premises.
(b) Prompt disposal of dead animals by complete incineration or deep burial under a layer of quick lime.
(c) Disinfection of contaminated byres and stables, control of insect, vectors and other carnivores, rodents and crows that feed on the carcasses should be done.
Prevention and Vaccination: Anthrax spore vaccine Dose: Cattle, a suspension containing 10 million spores, S/c.

1.2.1. Hemorrhagic septicemia (Pasteurellosis , shipping fever, HS)

It is a bacterial disease of dairy cattle and buffaloes caused by Pasteurella multocida. Mode of infection is by ingestion of contaminated water or feed contaminated with infected material from soil and utensil and by contact of diseased animals with healthy animals. The Incubation Period is 1 - 3 days.


Pneumonic Pasteurellosis in ...

The **Symptoms** are high fever (body temperature rises up to 104 to 106°F), Swollen head, throat, dewlap and neck. The swelling is hard, hot, tense and painful. Tongue is swollen and protruded

outside, salivation and difficulty in swallowing. Breathing becomes difficult on account of oedema of the pharynx. The Diagnosis is by symptoms, examination of blood smears or edema fluid for by polar organisms. Treatment and control is by sulpha drugs. Vaccination is by HS oil adjuvant vaccine (Bain's vaccine). Dose of vaccine in cattle is 2 to 3 cc i/ m.

1.2.3. Black-quarter (blackleg)

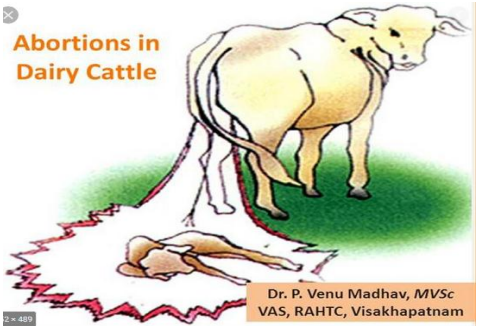
It is caused by Clostridium chauvoei. The mode of infection is by ingestion of the contaminated food and water. The Incubation period is 15 days.

The **Symptoms** are acute lameness with a hot, tense and painful swelling varying size situated usually in the hindquarter or fore limb, accompanied by high temperature. When the swelling is incised a dark frothy fluid escapes and the fluid has a very sour smell like that of rancid butter, crepitating sound on pressing the affected part of the muscle. Calves below 6 months of age and up to 3 years of age, are not usually affected by this disease. Diagnosis is based on symptoms, animal inoculation of dried piece of affected part and culturing of organisms in the laboratory.

Treatment and Control**:** Penicillin 10,000 IU per kg body weight followed by long acting Benzathin penicillin should be given. Local administration of antibiotics will be helpful to ease the recovery. All affected animals should be isolated. Dead animals should be promptly buried with lime. Annual vaccination is helpful in control of the disease. Prevention is by Black quarter vaccine which produces immunity for 18 months. The dose is 5 cc. S/c.

1.2.4. Brucellosis (Contagious bovine abortions, Bang's disease)

The disease is caused by Brucella abortus. The mode of infection is by ingestion and through breeding with infected bull. The Incubation period is about 21 days. The affected animal shows symptoms like abortion during the last stage of pregnancy. The placenta is usually characteristically altered and it is streaked with a yellowish slime and the cotyledons become flaccid and covered with creamy yellow coating. In bull, orchitis is noticed. The diagnosis is by clinical symptoms like abortion of number of cows at a time. Serological test is by blood serum agglutination test.



Treatment and control: Treatment is by broad spectrum antibiotics viz: Streptomycin and Aureomycin. Control is by removal of infected animals from the herd. Placenta and foetus should be burnt and the disinfection of infected byres, should be carried. Prevention is by vaccination with Brucella abortus strain 19 in calves. Dose: 5cc s/c

1.2.5. Tuberculosis

It is caused by Mycobacterium bovis. The Mode of infection is by inhalation of infected droplets and by ingestion of infected discharges from faeces, milk or urine and from open lesions in lymph nodes.

The disease is seen in two forms

1) Pulmonary tuberculosis which is usually a chronic disease. In the beginning slight cold with a short dry cough are present. Feeding or exercise may bring on the cough. After a time the cough becomes more frequent, harsh and moist. Temperature is not usually present in early stages, later on fluctuates. In the later stages the animal loses condition, become emaciated, hide bound with a harsh dry coat. The respiration becomes more difficult.

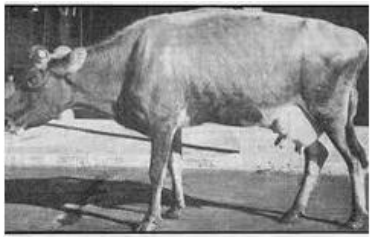
2) Intestinal tuberculosis in which the intestines, the mesenteric lymph gland, liver, peritoneum and pancreas become affected.

Diagnosis:

1) Clinical diagnosis of tuberculosis from the symptoms is possible only after the disease has reached a very advanced stage,

2) Microscopic examination of sputum, milk, faeces, urine, etc. reveals the organisms.

3) Tuberculin test: 0.1cc concentrated tuberculin injected intradermally into the skin on the side of neck in two successive doses. In non-reacting animals there is practically an insignificant increase in skin thickness. There is no heat or tenderness and no oedema around the firm nodule left by the injection.



Treatment is by anti-tuberculin drugs. Control is by test and slaughter method in which all the animals above 2 months should be tested. This is reliable method of control. Prevention is by BCG vaccine. The dose is cattle 5 to 50 mg moist weight of bacilli in an appropriate volume I/M and repeated annually.

1.2.6. Mastitis

This is a condition rather than a disease of high economic importance. An acute or chronic inflammation of the mammary gland caused by physical, chemical and biological agents chiefly of bovines usually affecting the secretary cells and frequently causing total suppression of milk. A large number of microorganisms have been implicated in mastitis.

They are divided into two groups: Infective group includes Streptococcus agalactiae and Staphylococcus aureus and pathogenic group which includes Streptococcus dysgalactiae, Streptococcus uberis, Corynebacterium pyogenes, Escherichia coli, Mycobacterium tuberculosis, Actinomycis bovis. Infection occurs by microorganism gaining access into the udder through the teat canal.

The predisposing factors may be in the individual cow or the herd as a whole. They include age of the animals, stage of lactation, milk yield, hereditary factors, trauma or injury of the udder or teats. The symptoms are:

mastitis risk in dairy cows ...

Sub-clinical mastitis: This can only be identified by laboratory examination of milk drawn from the udder. There are no visible signs. This is also called latent mastitis.

Chronic mastitis: It is characterized by repeated mild attacks of mammary swelling, with the production of clotted milk.

Acute or severe clinical mastitis: It is usually sporadic and is characterized by rapid onset of a diffuse swelling in a quarter that has been normal previously. There is a pain on palpation. The milk is not normal in appearance. High fever and anorexia is noticed. In per acute cases fever, depression and anorexia are also seen

The diagnosis is based on the symptoms which are seen in acute, per acute and chronic cases and sub clinical mastitis is diagnosed by laboratory tests. Examination of milk samples for cells, bacteria and chemical changes helps in identification of causative agent.

Treatment

- Success depends on the nature of the aetiological agent involved, the severity of the disease and the extent of fibrosis.

- Complete recovery with freedom from bacterial infection can be obtained in cases of recent infection and in those where fibrosis has taken place only to a small extent.
- Such drugs as acriflavine, gramicidin and tyrothricin have now ceased to be in use, and have given place to the more effective drugs, such as sulphonamides, penicillin and streptomycin.

Control is by elimination of predisposing factors, protecting the teats from injury and isolating the infected animal. Wipe the teat with dry cloth after milking. Udder, teats and milker's hands should be washed with antiseptic solution. A cream containing 0.5% Zinc oxide may be applied on teats abrasions. Maintaining hygienic conditions of surroundings, keeping the animals clean and healthy and early detection and treatment of all cows during drying off will be helpful.

Post mortem of mastitis

1.2.7. Pasteurella and *Mannheimia* Pneumonias in Sheep and Goats

Caused by *Pasteurella multocida* or *Mannheimia haemolytica* has a cranioventral lung distribution and affects sheep and goats of all ages worldwide.

Acute respiratory disease caused by *M haemolytica* is uncommon in adult sheep, unless there is a predisposing problem such as ovine pulmonary adenocarcinoma or other viral infection.

Clinical signs: acute onset depression, lethargy, and inappetance and are consistent with profound endotoxemia. Sudden death may occur without clinical signs having been observed. Affected sheep are typically separated from the remainder of the flock and are easily caught and restrained.

Affected sheep are typically febrile (>40.5°C [104.9°F]). The mucous membranes are congested, and there may be evidence of dehydration with sunken eyes and extended skin tent duration.

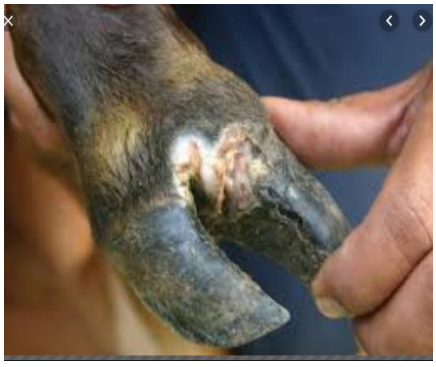
1.2. Viral Diseases

1.2.1 Foot and mouth disease

The causative organism is virus. The disease is transmitted through ingestion of infected feed and water, etc. The period of incubation is 2 to 10 days Symptoms of Foot and Mouth disease include:

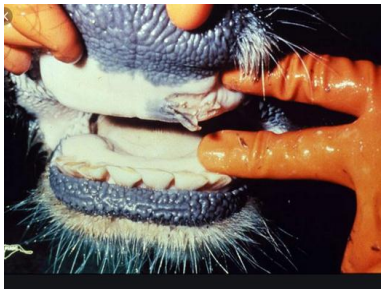
The first symptom is rise in temperature up to 104°F or more.

The temperature lasts only for a couple of days that is up to the appearance of the vesicles. Vesicles are commonly formed in the mouth and feet, on the udder and teats. Copious saliva secretion and rounded blisters like vesicles appear on the inner side of the lips, gums, dental pad, palate and tongue. Foot lesions develop at the region of the coronet.



Diagnosis is made by the presence of vesicles and ulcers in the mouth and feet, on the udder and teats.

Treatment: Treatment include Febrifuges: Sodium salicylate may be given; Mouth antiseptic: Wash the mouth with KMnO4 lotion 1:200; acriflavin lotion 1:5000 or copper sulphate 1 per cent solution and Foot.



Lotion: Should be treated with 1% copper sulphate solution or phenyl lotion and foot bath. Control: Controls includes isolation of sick animals, Quarantine of premises, disinfection of premises and Slaughter and disposal by burial or burning of all infected materials.

1.2.2 Cowpox

In this mild, eruptive disease of dairy cows, lesions are seen on the udder and teats. The virus of cowpox is closely related antigenically to vaccinia and smallpox viruses. Indeed, the first two can be differentiated only by sophisticated laboratory techniques.

The disease spreads by contact during milking. After an incubation period of 3–7 days, during which cows may be mildly febrile, papules appear on the teats and udder. Vesicles may not be evident or may rupture readily, leaving raw, ulcerated areas that form scabs. Lesions heal within 1 month. Most cows in a milking herd may become affected. Milkers may develop fever and have lesions on the hands, arms, or face. Occasionally, cowpox in people can cause generalized disease, and fatalities have been recorded.

Measures to prevent spread of cowpox within a herd must be based on segregation and hygiene. Cowpox and vaccinia viruses are important causes of zoonoses.

1.2.3. Lumpy Skin Disease

Lumpy skin disease is an infectious, eruptive, occasionally fatal disease of cattle characterized by nodules on the skin and other parts of the body. Secondary bacterial infection often aggravates the condition.

The causal virus is related to that of sheep pox. The prototype strain is known as the Neethling poxvirus. Lumpy skin disease appears epidemically or sporadically.

Clinical finding: A subcutaneous injection of infected material produces a painful swelling and then fever, lacrimation, nasal discharge, and hypersalivation, followed

by the characteristic eruptions on the skin and other parts of the body in ~50% of susceptible cattle.

The incubation period is 4–14 days. The nodules are well circumscribed, round, slightly raised, firm, and painful and involve the entire cutis and the mucosa of the GI, respiratory, and genital tracts. Nodules may develop on the muzzle and within the nasal and buccal mucous membranes.

The skin nodules contain a firm, creamy-gray or yellow mass of tissue. Regional lymph nodes are swollen, and edema develops in the udder, brisket, and legs.

1.3. Parasitic disease

1.3.1. **Fasciola hepatica in Ruminants**

Fasciola hepatica (30 × 2–12 mm and leaf-shaped) is distributed worldwide and has a broad host range, including people.

Eggs are passed in the feces, and miracidia develop within as little as 9–10 days (at 22°–26°C [71.6°–78.8°F]; little development occurs below 10°C [50°F]). Hatching only occurs in water, and miracidia are short-lived (~3 hr). Miracidia infect lymnaeid snails, in which asexual development and multiplication occur through the stages of sporocysts, rediae, daughter rediae, and cercariae.

Clinical finding: Fasciolosis ranges in severity from a devastating disease in sheep, alpacas, and llamas to an asymptomatic infection in cattle. The course usually is determined by the number of metacercariae ingested. Acute disease occurs 2–6 wk after the ingestion of large numbers of metacercariae (usually >2,000) over a short period.

In sheep, acute fasciolosis occurs seasonally and is manifest by a distended, painful abdomen; anemia; and sudden death occurring 2–6 wk after infection.

The acute syndrome can be complicated by concurrent infections with *Clostridium novyi*, resulting in “black disease” (clostridial necrotic hepatitis), although this is now less common due to vaccination against clostridial diseases.

In subacute disease, large numbers (500–1,500) of metacercariae are ingested over longer periods of time; survival is longer (7–10 wk), even in cases with significant hepatic damage, but deaths occur due to hemorrhage and anemia.

Chronic fasciolosis can be seen in all seasons but manifests primarily in late fall and winter.

Sheep do not appear to develop resistance to infection, and chronic liver damage is cumulative over several years. In cattle, a partial acquired resistance develops beginning 5–6 mo after infection.

1.3.2. Tick Paralysis

Tick paralysis (toxicity) is an acute, progressive, symmetrical, ascending motor paralysis caused by salivary neurotoxin(s) produced by certain species of ticks. With some species, other signs of systemic "single organ" toxicity (eg, cardiac, airway, bladder, lung, esophagus, etc) may be seen separate to or within the classic paretic-paralysis presentation.

In tick paralysis other than that caused by I holocyclus, clinical signs are generally seen ~5–9 days after tick attachment and progress over the next 24–72 hr. When I holocyclus is involved, clinical signs usually appear in 3–5 days (rarely longer, eg, up to 18 days, possibly with virginal ticks) after attachment and usually progress rapidly throughout the next 24–48 hr. Time periods can vary with I holocyclus because of tick factors, environmental humidity, temperature (microclimate), and host factors. Both "shorter onset to severe" signs and delayed "quiet" attachments with minimal signs may be seen.

THEILERIA OR TICK DISEASE

Hind limb paralysis begins as slight to pronounced incoordination and weakness, which is best observed with the animal turning or walking away from the observer (or when climbing stairs or jumping up). As paralysis progresses, the animal becomes unable to move its hindlimbs and forelimbs, to stand, to sit, to right, and finally to lift its head.

Self-Check -1	Written Test

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

4. _____ is characterized by repeated mild attacks of mammary swelling, with the production of clotted milk (3 pts)
5. The disease is transmitted through ingestion of infected feed and water, etc. (3 pts)
6. List the common diseases of cattle (6pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

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2.2. The main points of risk in dairy industry

- Risk is basically uncertainty about the future, hence the difficulties farmers have to live with when trying to predict their farm performance and profitability in years to come.
- There is business risk and there is financial risk. Business risk is the cost of inputs, returns from outputs and the level of farm production, while financial risk is concerned with the uncertainty about using other people's money.
- Sources of risk can be external and internal. External sources arise from natural, economic, social and political environments, while internal sources are those to do with the farm manager, such as his health, attitudes and aspirations.
- There is short-term and long-term risk. Variations in milk prices are a good example of long-term risk currently influencing the smallholder dairy farmer.
- Farmers can develop risk management strategies, such as planting more drought tolerant forage legumes as well as higher yielding forage grasses.
- Farm budgets and sensitivity analyses are useful tools for managing risk.
- Biosecurity against introducing cattle diseases and other animal health problems is a good example of risk management.

Small-scale dairy production in developing countries is subject to many risks from disease. This is the result of several factors such as limited knowledge of disease prevention, management and control; high prevalence of pathogens; and the cost, availability or suitability of animal health services. The loss of even one animal to disease may have a substantial impact on the household economy of a small-scale dairy producer with limited resources. Small-scale dairy producers generally make few investments in animal health, especially in disease prevention.

2.3. Risks of animal disease

- Animal diseases lead to mortality and reduced productivity in dairy herds worldwide, causing substantial economic losses.
- Diseases may affect dairy productivity through lowered milk yield, reduced fertility, delays in reaching puberty, reduced milk quality and reduced feed

- Diseases of dairy animals may also represent a risk for human health (e.g., tuberculosis, brucellosis).

Self-Check -2	Written Test

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

3. What are the consequences of risk of animal disease in the dairy farm? (5pts)
4. What are the main point of risks indicate in the dairy farm? (5pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

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Information sheet-3	Identifying and implementing prevention and control methods for each of the diseases

3.1. Prevention methods of non-infection disease

3.1.1. Prevention of environmental contamination

- 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.

3.1.2. Control of Intermediate host, vectors and reservoirs

- Limiting the contact between intermediate and final hosts by improvements in management.
- Direct action may be taken to reduce or eliminate intermediate host populations.
- Reduction in the number of snail intermediate host by chemical (molluscides) or biological control (ducks, Maris species of snails).

- Reduction in the number of snail intermediate hosts by drainage, fencing and other management practices.
- Reduction in the number of insect and tick vectors by chemical (insecticides/acaricides), biological control (hymenopterous insects, entomopathogenic fungi and Bacillus thuringiensis) and genetic control (sterile male technique, chromosomal translocation).
- Use of vaccines (Tickgard) at appropriate times may control the vector population.
- Destruction of reservoir hosts is important in controlling certain parasites, e.g., rodents for Leishmania and antelopes for African trypanosomes.

3.2. implement prevention

A. Preventive measure of mastitis

- Cow should be allowed in soft bedding following parturition.
- Concrete floor should be avoided especially in case of high yielder. Bedding should be done with straw, saw dust or sand. Sand is the ideal bedding material since it has lower bacterial count.
- Infusion should be used in each cow at dried off.
- Always the animal sheds should be clean.
- Washing the udder and hand of the milker with antiseptic lotion (4% Pottasium permanganate solution) before and after milking.
- The floor of the milking shed should be washed with running water.
- The milker's hand should be free from nail.
- Cleaning and disinfecting milking machine and the teat cup, vessels after each milking.
- The healthy non-infected cows should be milked first and known infected cows should be milked at last.
- Newly introduced cow should be milked separately and should be screened through California Mastitis Test (CMT).
- The first strip of milk should not be allowed to fall on the floor; they may be stripped in separate container along with disinfectants in it.

- Dipping of all teats following each milking with iodophor solution containing 1% available iodine or hypochlorite solution and Chlorhexidine in 0.5% to 1% polyvenylpyrrolidine solution.
- Immediately after milking should not allow the animal to lie-down by engaging with fodder.
- The milking timings should be in a regular manner.
- The complete milking should be done at every time and milk should not be stored in teats.
- The udder and teats should be protected from any injuries.
- Hygienic measures at milking time, udder preparation before milking, post milking teat disinfections have been recommended as preventive measures.
- Control of fly population should be attempted, for these insecticides fly repellent sprays are to be made in the house and surroundings.
- The frequently affected animals should be removed from the herd.

Suggested first aid

- Application of ice cubes on the udder surface.
- The milk from infected teat should be milked out daily three times and disposed safely outside.
- Calf should not be allowed to suck the infected teat.
- Antibiotic treatment and consultation should be made with qualified veterinary Doctor.

Control measure

- Immediately after detecting clinical signs, it should be consulted with qualified veterinarian for further antibiotic treatment.
- The infected animal should be kept separately from other animals.
- The calf should not be allowed to suck the infected teats.
- The milk from infected teat should be milked out daily three times and disposed properly without contaminate the environment.

- Mastitis milk should be properly disposed. 5% phenol may be added to the infected milk at the time of disposal.
- The healthy non-infected cows should be milked first and known infected cows should be milked at last.
- The non-responsive quarter should be permanently dried up

B. Preventive measure of foot and mouth disease

- Regular vaccination of farm animals, first dose at 3 months of age, followed by second dose at 30 days after first vaccination. Then repeated once in 6 months interval preferably during April- May.
- Vaccination of all the animals of an area/village is to be done at one time.
- Ring vaccination may be followed for control of disease outbreak and border vaccinations to protect disease free zones.
- Only vaccinated animals should be brought into the village from outside sources that too only 15-21 days following vaccination.
- No purchase of animals from disease prevailing areas.
- New animals should not be purchased until six months following outbreak.
- Unvaccinated animals should not be allowed to cattle fairs.
- Strict quarantine measures for newly purchased animals.
- A foot bath or truck bath may be made at the entrance of the village/farm.
- Always prefer to purchase / procure fodder from a place where FMD has not been recorded for a period of six months or so.

Suggested first aid

- Separation of affected animals from other animals.
- Mouth and feet of the affected animals should be washed with 1% potassium permanganate (KMnO4) antiseptic mouth wash3-4 times a day.
- Glycerin may be applied over the lesions.
- Antibiotic treatment and consultation should be made with qualified veterinary Doctor.

Control measures

- Solation and confinement of affected animals immediately after detection of clinical symptoms and restriction of animal movements.
- Infected animals should not be allowed to graze in common grazing pasture.
- Affected animals should not be allowed to drink water from ponds/streams/ rivers etc.
- Diseased animals should not be allowed to roam about with other animals of the village.
- Diseased animal handlers and attendants movements should be restricted to the other animal population / farms. If it is not practicable, people should scrub themselves and their belongings with soap and caustic soda.
- In case of outbreaks, healthy animals should be attended first and then the affected ones. After attending the sick animals, persons should wash himself and his clothes with 4% sodium carbonate solution. Utensils used for collecting milk should be cleaned with 4% sodium carbonate solution.
- Calves should not be allowed to suckle affected mothers and they should not be fed with milk from affected animals.
- Mouth of the affected animals may be washed with antiseptic mouth wash. 1% potassium permanganate solution may be applied 3-4 times a day.
- Feet of the affected animals may be washed with 2% copper sulphate solution. Antiseptic lotion and fly repellents are to be used to avoid infection and maggot formation on the wound.
- Disinfection of floors, premises and all infected materials by using Sodium hydroxide (2%), sodium carbonate (4%) and citric acid (0.2%) is advisable.
- Lime powder should be sprinkled around the animal houses.
- Foot bath should be made at the entrance of the farm

C. Preventive measure of abortion

- Proper disposal of the aborted fetus and its membranes.
- Prevention of infected materials (uterine discharges, fetal membranes) ingestion.
- Always the animal shed should be clean.

- To prevent abortion due to Infectious Bovine Rhinotracheitis and Infectious Pustular Vulvovaginitis (IBR-IPV) pregnant cows at any stage of gestation should not be vaccinated with IBR-IPV vaccine. Vaccination can be carried out in heifers at 6-8 months of age.
- To prevent abortion due to listeriosis, feeding of poor quality silage with high pH should be prevented.
- To prevent abortion due to brucellosis, vaccination of calves from 3 to 7 months of age with strain 19 Brucella vaccine and bull calves should not be vaccinated.
- Breeding should be stopped at disease outbreak.
- Contact between animals should be kept at a minimum during outbreak.
- Diseased bulls should not be used for breeding.
- The semen which is used for Artificial Insemination should be free from any infectious agents.
- Pregnant animals should be protected from other animals attack.
- Pregnant animal sheds should not be slippery.

D. Preventive measure of anthrax

- Due to the acute nature of the disease resulting in sudden death, treatment is usually not possible in animals even though Anthrax bacilli are clines. Treatment is of use in cases showing sub-acute form of the disease.
- In most cases, early treatment can cure anthrax. The cutaneous (skin) form of anthrax can be treated with common antibiotics.
- Regular annual vaccination of animals in endemic areas will prevent the disease from occurring.
- Vaccination may be carried out at least a month prior to expected disease occurrence in endemic areas.
- Never open a carcass of an animal suspected to have died from anthrax.

E. Preventive measure of pneumonia

- P. hemolytica is sensitive to oxytetracycline at 20 mg/kg given parenterally. The treatment should be repeated after 4-6 days because relapses may occur.

Penicillins are also used although some strains of P. haemolytica are not responsive to Penicillins. Ampicillin, sulphadimidine and trimethoprim-sulphonamide combinations have also been found to be effective.

- There is no effective vaccine against bacterial pneumonia because of the diversity of aetiologic bacteria and serotypes but in some countries, vaccination of lambs and kids with vaccines prepared from local strains of P. haemolytica have been used.
- Control of pneumonia in a herd can be achieved by isolation and treatment of the affected animals. Avoidance or minimization of predisposing factors such as overcrowding, long distance trekking and inclement weather can greatly reduce the incidence of pneumonia in a herd or farm.

G. preventive measure of brucellosis

- Treatment of the affected animals in usually not undertaken and such should be culled in order to reduce the sources of infection.
- Regular testing of animals, restriction of movement of animals and personnel between herds and purchase of animals with known health and reproductive records can prevent introduction and reduce the spread of the disease.
- Vaccination with a live attenuated B. melitensis Rev 1 strain vaccine confers strong immunity but it causes abortion if used in pregnant does and ewes.
- It is recommended that kid and lambs should be vaccinated at 3-8 months while adults should be vaccinated 2 months before breeding. A formalin-killed adjuvant vaccine 53 H 38 has been in use in pregnant animals elsewhere.

Prevention of viral disease

The spread of many viral diseases can be prevented by hygienic factors such as efficient sanitation facilities, effective waste disposal, clean water, and personal cleanliness. Active immunization by vaccines (antigen-containing preparations that elicit the synthesis of antibodies and thus immunity) has been useful in preventing common epidemics caused by acutely infectious viruses.

The best example of such a preventable disease is smallpox, caused by a disease-producing virus that at one time was found worldwide.

Anthelmintic Control of Parasites

Pasture management and anthelmintics (dewormers) are two methods now used to control internal parasites. Pasture management practices may reduce the parasite burden in cattle; however, this method alone will not guarantee parasite eradication.

Anthelmintics provide an excellent tool for controlling parasites. Application of dewormers should not be aimed at treating infected cattle showing signs of parasitism. Instead, apply dewormers in a timely manner to reduce infection before symptoms of disease occur. Treatment should also be aimed at interrupting the life cycle of the parasite in an effort to minimize pasture contamination.

Self-Check -3	Written Test

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

1. List 5 preventive measure of mastitis? (6pts)
2. What are mechanisms to prevent the spread of viral disease? (6 pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

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Information sheet-4	Identifying Public and economic importance of the diseases and giving advice

4.1. Public and economic importance of the diseases

Despite public health and veterinary public health improvements within the past century, human and animal populations remain vulnerable to health threats caused by infectious diseases. Noticeably, the rate of emerging infectious diseases is increasing (one new emerging or re-emerging disease every eight months).

Since they can be contagious to humans or compromise the food safety, the infectious diseases of animals represent a direct public health issue. They also carry an indirect threat since they account for the majority of the 20% losses that affect the livestock sector at the production level and since they could severely hamper the animal traction resources that are needed to produce or transport goods. These losses raise an issue of food security to sustain an increasing demand for proteins of animal origin.

By 2020, the livestock sector is expected to represent 50% of the agriculture outputs in value.

In developing countries, uncontrolled re-emergence of infectious diseases threatens the main asset of families, thus preventing them to escape from poverty.

Additionally, the animal morbidity and mortality generated by infections represent an unjustified emission of greenhouse gases, thus raising an environmental issue. In a growing number of countries, infections are also perceived as a primary concern for animal welfare.

4.2. Economic importance of disease

Disease may cause economic loss in feedlots through mortality, treatment cost, or effects on productivity. The impact of clinical and subclinical disease on production efficiency and economic returns may be greater than the losses associated with mortality.

A thorough understanding of the impact of disease on animal performance and economic loss is essential to make cost-effective recommendations to feedlot managers. The costs associated with death loss, chronically ill cattle marketed prematurely at a discount, and treatment are obvious and easy to calculate. Hidden costs, such as reduced performance and lower carcass quality, are often overlooked.

Treatment costs are another source of economic loss. Factors influencing the average cost include the morbidity rate, retreatment rate, cost of the drug(s), combination versus single antimicrobial therapy, whether adjunct therapy is used, labor, and feedlot markup on the products used.

The morbidity rate has the strongest influence on the average treatment cost for all cattle in the pen. When metaphylaxis is used to manage bovine respiratory tract disease, it must be added to the total medical cost for the pen.

Animal diseases can have a large economic and social effect. The diseases which cause the most concern are those which are highly contagious, could cause high fatality rates amongst livestock, have the possibility of infecting humans, or are not currently present in the United Kingdom. Non-zoonotic diseases are those that are not generally considered to be transmitted to humans. While zoonotic notifiable animal diseases are those that can be transmitted naturally between vertebrate animals and humans.

Self-Check -4	Written Test

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

1. What is the vulnerable health treats between human and animal population? (6pts)
2. How can be disease cause economic loss in feedlot through? (6pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

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Operation sheet # 1	Perform prevention of mastitis

Suggested first aid to prevention

- Apply of ice cubes on the udder surface.
- Milked out infected teat daily three times and disposed safely outside.
- Not allow to suck the infected teat.
- Antibiotic treatment and consultation

References

http://agritech.tnau.ac.in/expert_system/cattlebuffalo/Infectious%20Diseases%20of%20Cat tle%20and%20Buffalo.html

http://www.fao.org/docs/eims/upload/agrotech/1906/diseasesofsmallruminants.pdf

http://www.fao.org/dairy-production-products/production/animal-health/en/

http://ecoursesonline.iasri.res.in/mod/page/view.php?id=4902

https://www.msdvetmanual.com/respiratory-system/respiratory-diseases-of-sheep-and-goats/pasteurella-and-mannheimia-pneumonias-in-sheep-and-goats

https://www.britannica.com/science/virus/Prevention

https://www.msdvetmanual.com/management-and-nutrition/health-management-interaction-beef-cattle/economic-impact-of-disease

https://academic.oup.com/af/article/4/1/4/4638682

http://agritech.tnau.ac.in/expert_system/cattlebuffalo/general%20disease%20prevention.html

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