



Ethiopian TVET System



Animal Health Care Service Level -I

Training Module –Learning Guide 39-42

Based on Version 3 March 2018

Occupational Standard (OS)

Unit of Competence: Support Health Care Provision for
Pregnant, Parturient and Lactating
Animals

Module Title: Supporting Health Care Provision for
Pregnant, Parturient and Lactating
Animals

TTLM Code: AGR AHC1 TTLM11 0919

October 2019



Module Title: Supporting Health Care Provision for Pregnant, Parturient and Lactating Animals

TTLM Code: AGR AHC1 TTLM11 0919V1

This module includes the following Learning Guides

LG39: Follow OHS practices)

(LG Code: AGR AHC1 M11LO1LG39)

LG40 :Support health care for pregnant Animals.

(LG Code: AGR AHC1 M11LO2LG42)

LG41: Support health care for parturient animals.

(LG Code: AGR AHC1 M11LO3LG41)

LG42: Provide care for post partum animals

(LG Code: AGR AHC1 M11LO4LG42.)



Instruction Sheet	Learning Guide 39#
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Maintaining personal hygiene and cleanliness standards in accordance with OHS and organisational policies and procedures.
- Following workplace procedures and work instructions for controlling risks accurately.
- Identifying and reporting hazards to supervisors
- Preparing appropriate tools for checking animal health and control

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 OHS and organisational policies and procedures.
- Workplace procedures and work instructions for controlling risks are followed accurately.
- Hazards are identified and reported to supervisors.
- Appropriate tools for checking animal health and control are prepared according to workplace guidelines.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask your teacher for assistance if you have a hard time understanding them.
4. Accomplish the “Self-check 1” in page -.



5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.



Information sheet-1

Maintaining personal hygiene and cleanliness standards in accordance with OHS and organisational policies and procedures

1.1 Maintaining personal hygiene and cleanliness in obstetrics

1. First the nail of fingers should be removed to avoid damage during rectal examination
2. The arm and hands should be washed with clean water and soap before wearing glove.
3. Next the fingers thumb should be brushed with sterile brush then palm and back of the hand
4. Pour 70% isopropyl of ethyl alcohol over the hand and arms to disinfect
5. put on sterile gloves

1.2 Clean animal housing

The pregnant animals' house hygiene should be maintained to reduce infection and contagious diseases are as follows:

- a. Proper disposal of wastes and dead animals
- b. Proper sanitation and disinfection
- c. Providing ration as required
- d. Vaccination

Proper cleaning and sanitation removes most of germs and parasites along with dirt, thereby remaining germs are few in number and possibly in weakened condition so as to be harmless under ordinary conditions. Following are the main points in this context:

1. Proper sanitation discovers causes of all preventable diseases.
2. It helps to devise means of rendering the causes ineffective if not removed of the causes of spread of disease
3. Helps in providing the favorable conditions of life in respect of water, air, well sanitized sheds etc.
4. Helps in increasing the efficiency of animals



5. Prevent economic losses due to infection
6. Helps in development and growth of animals, makes life vigorous and productive
7. Lowers the rate of mortality and increases the longevity of animals
8. Prevents occurrence of diseases and establishes conditions that ensure preservation of health
9. Helps in minimizing contamination and production of good quality milk and milk products
10. Helps dairy man to learn and make continuous efforts at improvement

Sanitizing agent

It is a solution which will hold the number of bacteria below 25% per(sq).(or 4 bacteria/cm²) on the surface of utensils, milk containers or dairy equipments. In general half the strength of a disinfectant substance is needed for sanitizing purpose.

Sanitation programme

It includes the following:

1. Adequate ventilation
2. Proper lighting
3. Adequate drainage
4. Proper cleaning
5. Proper disinfection

Losses among livestock from infectious diseases and parasites can be prevented if the following essential features of adequate sanitation are adopted in the veterinary clinic facilities:

- a. Proper ventilation without drafts, and without moisture on walls and ceiling.
- b. Proper disposal of manure, feed wastes and other excreta twice daily and keeping manure pit covered with straw to prevent practice place of flies.
- c. Proper construction of smooth and wide enough gutter for holding accumulated droppings and with proper slope to facilitate drainage of liquid excreta.



- d. Watering and feeding utensils so constructed that they may be easily cleaned and thoroughly disinfected.
- e. Good lighting programme through doors, windows, ventilation and artificial lights to facilitate proper cleaning and keeping floor dry.
- f. Smooth inside of walls with corners rounded to facilitate cleaning and disinfection.
- g. Use of proper and clean bedding material (saw dust, paddy straws, etc) and removed at least once daily.
- h. Avoiding use of permanent pastures where internal parasites or their intermediate hosts are found.
- i. Adequate cleaning prior to disinfection.
- j. Sweeping and scrubbing all feed racks, troughs, and passages and disinfecting with lye solution.
- k. Burning of all sweeping and scrapings.
- l. Application of heavy coating of white-wash containing a reliable disinfectant to the floors, walls, and partitions, mangers etc. (1/2 kg of lime in one gallon of water and disinfectant).
- m. Providing plenty of shade in hot weather.
- n. Separate housing of animals
- o. Protecting feed and water from being contaminated with sewage disposals.
- p. Proper disposal of infected litter, dead animal and animal products
- q. Abundant supply of clean water with good pressure for easy and effective cleaning of caring facilities.
- r. Clinical housing facilities must be constructed of concrete; metal stanchion and partitions which are easier to clean than wood.
- s. Cleaning should be followed by the use of disinfectants over all surfaces.
- t.

DISINFECTION

It means act of destroying the cause of an infection

Disinfectant is any compound used to kill bacteria, virus, fungi and parasites.

Types of disinfectants:



- a. **Physical:** sunlight and heat (hot air, hot water, steam, fire)
- b. **Chemicals:** acids, alkalis and compounds

Acids include Boric acid, carbolic acid (phenol), etc.

Alkalie include hydroxide, lime solution, potassium hydroxide, hydrogen per oxide

Compounds include: mercury chloride, potassium per manganate, quaternary ammonium compounds, etc.

Four essentials of practical work of disinfection:

- i. Preparation of building
- ii. Selection of the type of disinfectant
- iii. Methods of application of disinfectant
- iv. Cautions

Common disinfectants:

- a. Washing soda (sodium carbonate)
- b. Lime
- c. Potassium permanganate
- d. Phenol
- e. Formalin formaldehyde
- f. Bleaching powder
- g. Sodium hypochlorite
- h. Quaternary ammonium salts
- i. Boric acid

Safe Waste Disposal Practices in Animal Facilities

Work in animal facilities commonly involves use of sharp instruments. All sharp items (e.g., needles, scalpels, capillary tubes, etc.) must be handled safely, and placed in designated sharps containers for disposal as per institutional policy. Needles should never be recapped and re-used.

Animal Waste Disposal



All animals, animal wastes and related materials should be disposed of as per institutional policy. Institutions commonly have a protocol defining proper disposal of all animal carcasses or organs. For example, this might involve collection of all such materials for incineration or other safe disposal. Disposal of non-contaminated waste (dirty bedding, feed, etc.) may differ from institution to institution. Adherence to animal facility waste disposal policies will minimize the risks to the community.



Self-Check-3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Discuss how personal hygiene maintained? (4)
2. How sanitation maintained?(4)
3. What is the difference between cleaning and sanitation?(4)

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

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

Answer Sheet

Score = _____

Name: _____

Date: _____

Short Answer Questions



Information sheet-2	Following workplace procedures and work instructions for controlling risks accurately
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2.1 Workplace Health and Safety requirements

A Workplace Health and Safety Officer is trained and engaged to provide expert advice on OHS issues and to identify health and safety hazards and help implement risk assessments in the workplace.

A combination of OHS consultation mechanisms as prescribed by the OHS legislation is recommended.

As legislative consultation arrangements evolve and differ from state to state, a review of your state's/territory's current OHS legislation is recommended

Roles and Responsibilities

.Many basic elements (e.g., rights and responsibilities of workers, responsibilities of employers, supervisors, etc.) are similar in all the jurisdictions across Canada for example; the details of the OH&S legislation and how the laws are enforced vary from one jurisdiction to another. In addition, provisions in the regulations may be "mandatory", "discretionary" or "as directed by the Minister". In May 2001, a number of amendments to the Occupational Health and Safety Act were proclaimed. One important amendment, effective January 1, 2002, requires employers with ten or more employees to establish and maintain a written health and safety program, and for employers with less than ten employees to establish and maintain a written health and safety policy. Specific regulations outlining the required elements of an occupational health and safety policy and program were approved by government in December 2001, and are reproduced below.

A. Employer responsibilities include:

- providing and maintaining safe equipment, systems and tools;
- providing and maintaining the information, instruction; training, supervision and facilities that are
 necessary to ensure the health, safety and welfare of workers;



- ensuring workers use necessary protective clothing and devices;
- ensuring work procedures comply with legislation and safe work practices at all times;
- ensuring all workers are aware of workplace hazards and follow safe work practices and procedures;
- consulting/cooperating with the WH&S representative/OH&S committee
- ensuring workplace inspections are completed on a regular basis and follow-up actions taken as necessary;
- ensuring WH&S representative/OH&S committee participate in workplace inspections; and
- Reporting serious injuries or death to the assistant deputy minister and the WH&S representative/OH&S committee.

B. Employee responsibilities include:

- protecting his/her own and other workers' health and safety;
- consulting/cooperating with the WH&S representative/OH&S committee;
- knowing and following legislation and safe work practices at all times;
- properly using all safety clothing/equipment/devices provided; and
- reporting unsafe conditions in the workplace.

C. the role of health and safety committee:

The role of health and safety committees or joint health and safety committees include:

- act as an advisory body
- identify hazards and obtain information about them
- recommend corrective actions
- assist in resolving work refusal cases
- participate in accident investigations and workplace inspections



make recommendations to the management regarding actions required to resolve health and safety concerns.

Occupational health & safety in vet surgery

Like any other jobs, there are professional hazards, which occur at veterinary surgery while performing surgical activities. Veterinary occupational health and safety policy and procedure help to reduce these veterinary occupational risks. Veterinarians, animal handlers, animal health technicians and animal health assistances can be exposed to occupational health risks, while working around animal houses & veterinary clinics. With the knowledge of what causes injuries & disease, it is easier to design and implement suitable measures to wards privations certain safety rules must be followed when attempting to capture, restrain, treat, feed or exercise animals

Application of OHS procedures and techniques in veterinary surgery

The essential requirements for any work with infectious agents are as follows:

1. Personnel access to the surgery should be restricted.
2. Protective clothing, including gloves, mask cover/gas mask must be worn in surgical area and removed when leaving the surgery
3. Surgery room door should be closed when work is in progress & ventilation should be provided by extracting air from the room.
4. Food or drink must be not stored or consumed in surgery room
5. Smoking must not take place in the surgery room
6. Emergency plan should be developed
7. Materials for disposal must be transported without spillage in strong containers.
8. Waste materials should be incinerate/burn
9. Any accident must be recorded and reported to the safety officer
10. Using of relevant protective clothing and equipment
11. Using gowns, goggles , cap and gloves
12. Checking and fulfilling required safety devices before starting operation
13. Using anaesthesia during operation

As an employer, you are in charge of a safe and healthy working environment for your employees. You are familiar with the safety risks within your sector, as well as the measures you can take to counteract these risks.

2.1 WHAT IS PERSONAL PROTECTIVE EQUIPMENT (PPE)?

PPE means personal protective equipment or equipment you use to guarantee your (own) safety.

Use PPE always and anywhere where necessary. Observe the instructions for use, maintain them well and check regularly if they still offer sufficient protection. But when do you use what type of protection?

2.2 TYPES OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

1. SAFETY FOR THE HEAD



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

2. PROTECT YOUR EYES



The eyes are the most complex and fragile parts of our body. Each day, more than 600 people worldwide sustain eye injuries during their work. Thanks to a good pair of **safety glasses**, these injuries could be prevented. Do you come into contact with bright light or infrared radiation? Then **welding goggles or a shield** offer the ideal protection!

3. HEARING PROTECTION



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

4. MAINTAIN A GOOD RESPIRATION



Wearing a **mask** at work is no luxury, definitely not when coming into contact with hazardous materials. 15% of the employees within the EU inhale vapours, smoke, powder or dust while performing their job. **Dust masks** offer protection against fine dust and other dangerous particles. If the materials are truly toxic, use a **full-face mask**. This adheres tightly to the face, to protect the nose and mouth against harmful pollution.

5. PROTECT YOUR HANDS WITH THE RIGHT GLOVES



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

- protection against vibrations
- protection against cuts by sharp materials

- protection against cold or heat
- protection against bacteriological risks
- Protection against splashes from diluted chemicals.

6. PROTECTION FOR THE FEET



Even your feet need solid protection. **Safety shoes** (type Sb, S1, S2 or S3) **and boots** (type S4 or S5) are the ideal solution to protect the feet against heavy weights. An **antiskid sole** is useful when working in a damp environment,

definitely if you know that 16,2% of all industrial accidents are caused by tripping or sliding. On slippery surfaces, such as snow and ice, **shoe claws** are recommended. Special socks can provide extra comfort.

7. WEAR THE CORRECT WORK CLOTHING



Preventing accidents is crucial in a crowded workshop. That is why a good visibility at work is a must: a **high-visibility jacket and pants made of a strong fabric** can help prevent accidents. Just like the hand protection, there are versions for different applications.



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is responsibility of employee and employer in maintaining OHS?(6 points)
2. List Personal protective equipments(6 points)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



2.2 Definition of terms

Occupational health: the effect of work on human health and the impact of workers health on their work

Occupational Health and Safety (OHS): Any occurrence which results in personal injury, disease or death, or property damage

A hazard: A hazard is anything that has the potential to harm the health or Safety of a person.

Risk: Risk is the significance of the hazard in terms of likelihood and severity of any possible injury.

Safety: The provision and control of work environment systems and human behaviour which together give relative freedom from those conditions and circumstances which can cause personal injury, disease or death, or property damage.

Hazardous Substances Any substance that has the potential to harm the health of persons in the workplace and includes chemicals scheduled under the Poisons Act, chemicals classified under the Dangerous Goods Act (1975) or Hazardous Wastes.

OHS policies: An OHS policy is a broad statement that says who is responsible for managing and monitoring OHS and lists any particular objectives for OHS, such as reducing vehicle accidents or days off work due to work-related illness or injury. It is supported by a set of OHS procedures and work instructions that together should cover what must be done to eliminate or minimize risks in the work-place

Personal Protective Equipment (PPE): Personal protective equipment (PPE) may include ear, eye and chemical protection, protective clothing, sunscreen lotion, gloves, safety harness and headgear:

Procedures: Hazard policies and procedures, emergency policies and procedures, procedures for use of personal protective clothing and equipment, hazard identification and issue resolution procedures, job procedures and work instructions, reporting procedures, and the installation of workplace safety signage.



Why OHS is Important

Occupational Health and Safety (OHS) is about working safely and ensuring that the work place is a safe place for everyone, including visitors to the Property.

It is normal to think that 'I'm Ok, nothing will happen to me.' But if we are careless around the workplace then accidents will happen. The results may be minor like a cut finger or bruised leg. However, when you think about the machinery, chemicals and other hazards on a in livestock farm, you realize that it could be a very dangerous place.

3.2 Concept of hazards

The term hazard: A hazard is anything that has the potential to harm the health or Safety of a person or an animal.

The hazard identification process is designed to identify all the possible situations where people may possibly be exposed to injury, illness and disease arising from all sources including the above.

Prior to the introduction of any plant, substances, processes or work practices in the workplace, it is essential for the hazard identification process to be carried out to identify whether there is any potential for injury, illness or disease associated with such introduction. This will assist you to take the necessary actions for what may otherwise be extremely costly further down the track if no action is taken at this early stage.

Carrying out hazard identification for all existing plant, substances, processes and work practices in your workplace may require some effort. If you have a large workplace, it is a good idea to split it into several discrete areas for the

hazard identification process, and to tackle one area at a time. Priority should be given to areas with hazardous plant, substances, processes or environment.

In order to minimize the time involved, it is better to perform hazard identification on all sources of hazards in a particular area of the workplace instead of doing each hazard source (e.g. plant, hazardous substances etc) at a time.



The relevant health and safety representatives need to be consulted during the hazard identification process. Employees working in the area have day to day experience of any hazards and should be involved in the hazard identification process. Advice should also be sought from people who are associated with the activities and processes in the area because they may provide valuable input.

Hazards in the workplace can change from day to day. In order to effectively manage workplace health and safety you need to introduce proper systems and procedures to ensure hazard identification is carried out on a regular basis. The OHS legislation requires you to repeat the hazard identification process:

3.3 Types of hazards

1. Physical Hazards: this can be electrical equipment's, open flames, lab. Instruments and glassware can all be hazardous if improperly used.

- **Electricity:** is one of the most important physical hazards, when the electrical equipment's are use, the technicians should follow the use instruction. In the lab work should avoid electrical overloaded. They are a potential fire hazard and can also cause equipment damage.
- **Fire:**is other of the most important physical hazards, but is not common. It can occur when open flames, such as Bunsen burners, are in use. It can damage clothing and long hair if are near to the fire. When necessary use is any flammable chemicals is better keep in a flameproof cabinet. In case of fire, in the lab should be fire extinguisher and any escape route in case of the exit is blocked.
- **Laboratory equipment:** during working with autoclave, the technician should work carefully trying to avoid any explosions and burns; because it
- use pressurized steam to sterilize surgical instruments, glassware, sterile solutions, materials to be used in microbiology, for decontaminate materials such as blood specimens, bacterial cultures or filled biohazard containers before disposal and other materials present special hazards, etc.

2. Chemical hazards can be flammable, toxic, caustic, corrosive, carcinogen or mutagenic.

All chemicals must be labeled with "**hazard information**" on the containers



3. Biological hazards:

It can be contaminated with bacteria, virus, fungus, or parasites. It can produce also by bite from the laboratory animals. In microbiology lab, making any bacteriological culture is recommendable in the microbiological safety cabinet. Avoid contact from biological culture. After any lab work, the technician and all surfaces must be disinfected with known disinfectants.

4. Allergic hazards:

Allergic hazards associated with breathing or contacting animal dander or urine allergens (among others). The safest policy is to reduce exposure by wearing protective clothing (such as facemasks, gloves, and a lab coat) when handling animals.

1.1 procedures to remove or minimize hazards

- **Design or re-organize to eliminate hazards**

It is often cheaper and more practical to eliminate hazards at the design or planning stage of a product, process or place used for work. In these early phases, there is greater scope to design out hazards or incorporate risk control measures that are compatible with the original design and functional requirements. For example, remove trip hazards on the floor or dispose of unwanted chemicals.

- **Substitute the hazard with something safer**

If it is not reasonably practical to eliminate the hazards and associated risks, you should minimize the risk. For example, today the dangers associated with asbestos are well known and there are numerous alternatives to asbestos products currently on the market including cellulose fiber, thermoset plastic flour

or polyurethane foams. Replacing solvent-based paints with water-based ones is also a better alternative.

- **Isolate the hazard from people**

This involves physically separating the source of harm from people by distance or using barriers. For example, introducing a strict work area, using guard rails/fence around exposed edges and holes in the floors, using remote control systems to operate machinery, enclosing a noisy process from a person and storing chemicals in a fume cabinet.



- **Use engineering controls**

An engineering control is a control measure that is physical in nature, including a mechanical device or process. For example this can be done through the use of machine guards, effective ventilation systems and setting work rates on a roster to reduce fatigue.

- **Use administrative controls**

Administrative controls are work methods or procedures that are designed to minimize exposure to a hazard. Establish appropriate procedures and safe work practices such as; limit exposure time to a hazardous task so that fewer employees are exposed, routine maintenance and housekeeping procedures, training on hazards and correct work methods and use signs to warn people of a hazard.

- **Use Personal Protective Equipment (PPE)**

Provide suitable and properly maintained PPE and ensure employees are trained in its proper use. Examples include gloves, earplugs, face masks, hard hats, gloves, aprons and protective eyewear. PPE limits exposure to harmful effects of a hazard but only if workers wear and use the PPE correctly.



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List out methods of minimization of hazards (2pts?)
2. Why it's important hazard minimization methods (3 points)

Note: Satisfactory rating - 2 and 3 points Unsatisfactory - below 2 and 3 points

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

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

3. Define hazards? (2pts)
4. List the type of hazards and explain each of them. (6 points)

Note: Satisfactory rating - 2 and 6 points Unsatisfactory - below 2 and 6 points

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

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information Sheet- 4	Preparing appropriate tools for checking animal health and control
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Common Tools/instruments used in animal restraint and health:

A. Tools used for restraining:

1. Mouth gag probang: a device used for examination of mouth, teeth and administering drug.
2. Bull holder: to control the bull.
3. Nose tongs: a clamp used to grasp the nasal septum and can severely restrict activity.
4. Bull nose ring: to lead the animal and use safely.
5. Bull nose punch: to make hole in the nose of bull for fitting the nose ring/nose string.
6. Muzzle prong: rubber device to fit on muzzle of animals to prevent self-sucking of milk, licking wound, biting, eating, or drinking, etc.
7. Halter: for handling and leading the animals and are used when the head needs to be tightly restrained.
8. Cradle: a device used to immobilize the neck of animals, short piece of wood bored longitudinally for passing string in it.
9. Anti cow kicker: to prevent kicking by the hind leg of less animal and prevent injury at milking time.
10. Milker's restraint rope: for tying legs at milking times.
11. Udder-Kinch: to prevent kicking by animals, as cow will crouch when rope pulled up-side.
12. Hobbles: a band of leather or of a wooven cord which is applied around the animal's leg. It may have a rope or metal ring attached to it through which rope is passed. They can be applied around the pastern or hock.
13. Casting rope: to throw animal on the ground and bring under control for various operations.
14. Trevis or cruch: used for restraining large animals, when casting is not needed. It is a cage like structure with four (4) corners poles fixed.
15. Squeeze chute/head catch: used for rigid confinement of animals and for head controlling.
16. Stocks: are made of heavy pipes/poles/wooden tool , anchored well to the ground surface, with the horizontal pieces set at the level of animal's shoulder (large animals); used for holding confinement of animals for various procedures.



B. Tools used as aid for administration of drugs

1. Syringes with needles: to give injection of medicines/vaccines.
2. Stomach tube: made of rubber used to feed animals artificially or administer the medicines orally.
3. Drenching gun: to give medicine to animals in suspension/solution/liquid forms orally.
4. Balling gun: to give medicine to animals in bolli, paste, pills etc into the throat.
5. Gravity injection out-fit: used for transferring sterile solution medications from the bottle through a rubber hose and needle into vein/peritoneal cavity/teat.
6. Sprayer: used for spraying insecticides.
7. Dipping fork: for dipping animals to protect from ectoparasites.

C. Tools used as an aid for injuries and treatment of wounds

1. Thomas splint: used to apply some traction upon fractured limbs.
2. Scissors: for general use in cutting bandages, tissues, etc.
3. Dissecting or dressing forceps: for cleaning wounds and dissecting purpose.
4. Suture needle: made of metal for suturing wounds.

D. Tools used in surgical operations

1. Burdizzo's castrator: used for closed castration of male cattle, sheep and goats.
2. Elastrator: used for castration of calves or removing tender horns in young calves.
3. Emasculator: used for open castration in equines, camels, etc.
4. Docking machine: to cut the tail of lambs, dogs, etc.
5. Hair clipping machine: to remove hairs on belly, under tail, skin surfaces.
6. Mechanical dehorner: to cut the horns.
7. Dehorning saw: to cut the horns.
8. Bone cutter: used for cutting bones-broken or increased.
9. Trocar and canulla: remove gas from rumen in bloat.
10. Teat dilator: to remove blockage of teats.
11. Teat siphon: to remove milk from teats when blockage occurs.
12. Teat tumor remover: to make passage clear in teats.
13. Dystocia set: used in difficult parturition/delivery/birth.
14. Obstetrical phantom box: to facilitate delivery of abnormal presentation of calf.
15. Embryotomy knife: to cut the dead calf in the uterus and remove it in dystocia.
16. Prolapse clamp: to prevent prolapsed of uterus and vagina.

17. Hoof trimmer and hoof knife: to cut the hoof as an aid for shoeing the animals.
18. Pincers: for withdrawing nails at shoeing time and drawing clenches.
19. Electrical dehorner: to remove horn buds in calves.



20. Tattooing forceps: to give permanent number to animal for identification.
21. Earnotcher: to make notches on the ear for permanent marking of animals.
22. Ear/neck chain tags: used for giving number to animal on the ear.
23. Branding iron set: for branding animals and giving permanent number
24. Catheter: to remove urine from bladder.
25. Artery forceps: to close the artery/vein to stop bleeding.
26. Scalpel: used for cutting wounds and dissection.
27. Tooth cutter: to cut tooth.
28. Driving hammer: for driving nails at shoeing time.

E. Tools used for diagnostic purposes

1. Clinical thermometer: to record temperature of the body.
2. Stethoscope: to detect abnormal sounds of internal hollow organs.
3. Measuring tape: to note length for girth of animals.
4. Weigh bridge: to record the weight of animals.
5. Mastaid paddle: used for detection of mastitis in California Mastitis Test
6. Strip cup : to detect mastitis infection.
7. Vaginal speculum: used for examination of vagina.
8. Eye speculum: for examination of eye by opening the eyelids.
9. Microscope: for examination of diagnostic specimens.
10. Blood lancet: to cut tissues and collect blood samples.
11. Haemocytometer with micro-pipette: for counting RBC and WBC.
12. Mortar and pestle: to grind large-sized samples/medicines into smaller ones and prepare powder.
13. Measuring glass: to measure water for preparation of mixtures.
14. Enamel tray: to keep tools and drugs.
15. Stirring plunger: used for mixing liquids in vets.
16. Autoclave: used for sterilization of tools and glass wares.

F. Tools used for sanitary aspects

1. Apron: to protect clothes from soiling.
2. Floor squeeze: to clean floor.
3. Shovels, brooms: for cleaning barns.
4. Dung scraper: cleaning of dung/manure.
5. Scrubbing brush: for cleaning water troughs, walls, utensils.
6. Body brush: used for grooming of animals.
7. Curry comb: used for grooming of animals.
8. Washing trough: for cleaning tools and utensils.

9. Autoclave: used for sterilization of tools and glass wares.

1. ANIMAL HANDLING AND RESTRAINT

Why Learn Restraint Techniques?

Purposes:

- To attend animals safely



- To prevent injuries to animals
- To carry out operations and administer drugs conveniently and efficiently

Definition:

Restraint means hold back, check, or suppress action; to keep something under control; or to deprive of physical freedom. Restraint is also defined as forcible confinement; in veterinary practice it is the forcible confinement of an animal within the practice's care.

Restraint is the use of manual, mechanical, or chemical means to limit some or all of an animal's normal movement for such purposes as examination, collection of samples, and drug administration.

Or Restraint is the restriction of movement of any animal and may vary from simply confining the animal in an enclosure, small space, box, or crate, to completely restricting its muscular activity (immobilization).

Various degrees of patient restraint can be used to allow the veterinary medical team to examine, treat, and perform supportive procedures as prescribed by the veterinarian:

Restraint in its mildest form is a gentle touch and a soft voice. For example, when first meeting a canine patient, you need to start with a soft stroke to the head and a gentle hello. This will go a long way in gaining the animal's trust.

In its moderate form, restraint can involve confinement in a corral, box stall, or cage that limits the animal's movement or may be as restrictive as immobilizing a portion of the animal's body, as is necessary for jugular venipuncture.

Restraint in its most restrictive form can be as involved as causing a reduction or complete loss of muscular control through the use of chemicals such as tranquilizers, sedatives, and general anesthetics.

Basic Principles of Restraint

If you are considering restraining an animal, then ask the following questions:

- (a) why is the animal being restrained? Is it necessary?
- (b) Which method should be used? (greatest gain, least hazard).
- (c) When is the best time of day to restrain the animal?
- (d) Who is best qualified to carry out the procedure ? (Least amount of time, least amount of stress.)
- (e) What is the best location.

If restraint devices are required, they should be suitable in size, design, and operation to minimize discomfort or injury to the animal. Typically, animals are restrained for brief periods, usually minutes, in most practice's care.



Where at all possible, handling should be avoided by using shifts. Veterinary technicians and assistants will be using restraint techniques every day in their professional lives. It is a skill that takes practice to master and to feel confident performing. It should be the objective of the restrainer to never let the person performing the procedure get hurt. Anyone who is performing a procedure wants to be able to concentrate on the task at hand and not have to worry about what the animal is doing. A technician or assistant should have the attitude that “no one will get hurt while I am restraining the animal.” The potential for serious injury is ever present.

Because the veterinary facility is liable for any injury an owner sustains from their pet, owners should not be allowed to perform restraint. It goes without saying that the average owner is not likely trained in proper restraint techniques.

Different animals require different restraint techniques. For example, cats usually do well with minimal restraint, whereas a dog typically requires more control. Individual animal temperaments will also dictate which technique is appropriate. A friendly dog may require less restraint than a fearful or aggressive dog.

Some techniques are appropriate to perform in of the pet’s owner, whereas others are not as they may look harsh. For example, the cat ‘stretch’ restraint technique, while not harmful to the cat, may be viewed by the owner as cruel.

Different restraint techniques are required for the performance of veterinary procedures. For example, an unpleasant procedure such as a rectal examination will require more restraint than auscultation of the heart. Certain procedures require special techniques. For example, the restraint for obtaining blood from the jugular vein is vastly different than that required for venipuncture of the medial saphenous.

Restraint devices or chemical restraint should be considered for prolonged or potentially painful procedures.

In all situations, regardless of species, one must have patience. If a restrainer is in a bad mood or is pressed for time, this could make a difficult situation worse.

Health and Safety in animal handling and restraint

Basic Guidelines for Performing Animal Restraint

To work safely with an animal a person should:

- understand basic animal behaviour in relation to their interactions with people during handling
- appreciate the "flight zones" typical of a species
- understand how to communicate with the animal



- use appropriate restraint techniques
- use restraint equipment properly
- identify any animals that may be unpredictable
- wear appropriate protective clothing and equipment
- maintain appropriate vaccination status

Important guidelines for restraint of any duration

- Restraint devices should not be used simply as a convenience in handling or managing animals.
- When restraint devices are used, they should be specifically designed to accomplish healthcare goals that are impossible or impractical to accomplish by other means or to prevent injury to animals or personnel.
- The period of restraint should be the minimum required to accomplish the procedure.
- If possible, animals placed in restraint devices should be given training to adapt to the equipment and personnel.
- Provision should be made for observation of the animal at appropriate intervals.
- Veterinary care should be provided if lesions or illnesses associated with restraint are observed. The presence of lesions, illnesses, or severe behavioral change often necessitates temporary or permanent removal of the animal from restraint.

General Guidelines for Care of Restrained Animals

- Restraint procedures should only be invoked after all other less stressful procedures have been rejected as alternatives.
- Supervision of animals in restraining devices should only be assigned to fully qualified and experienced personnel.
- The principal veterinary staff has the responsibility to ensure that all members of the veterinary staff, particularly those responsible for day-to-day animal care, are fully aware of the rationale for the restraint procedures and for the complications for the animal which may occur as a result of the restraint.
- Consultation should be sought with those experienced in the restraint procedures to be invoked, prior to its initial use, to ensure that minimal restraint is used to accomplish the procedure goals.
- Physiologic, biochemical and hormonal changes occur in any restrained animal and veterinary staff should consider how these effects will influence their proposed restraint procedures.

The principles of low stress restraint are:

- a. Solid sides or barriers around the cattle to prevent them from seeing people deep inside their flight zone. This is especially important for wild or excitable cattle.



- b. To prevent lunging at the headgate, the bovine's view of an escape pathway must be blocked until it is fully restrained. This principle does not apply to pigs.
- c. Provide non-slip flooring for all species of animals.
- d. Slow steady motion of a restraint device is calming, while sudden jerky motion excites. Applies to all species.
- e. Use the concept of optimal pressure. Sufficient pressure must be applied to provide the feeling of restraint, but excessive pressure that causes pain or discomfort must be avoided. This principle applies to all species.
- f. The entrance of the restraint device must be well lighted. All species must be able to see a place to go.
- g. Livestock will remain calmer if they can see other animals close to them.
- h. Engineer equipment to minimize noise. High pitched noise is more disturbing to livestock than a low pitched rumble from a conveyor.
- i. Restraint devices must be designed to avoid uncomfortable pressure points on the animal's body.
- j. Restrain animal in an upright position.

Because every restraint incident will affect the life, activities and behaviour of an animal the following points should be considered:

- Restraint of an animal should be used only when absolutely necessary and never as part of a daily maintenance routine (except where the animal may be routinely moved through a squeeze cage, or chained, for example).
- Only use the minimum amount of force necessary to accomplish the task.

Indications / circumstances requiring restraint

Animals can be unpredictable and might not react they way you expect. Animals in pain can be very aggressive and/or defensive. Restraint is used to protect the animal and the veterinary staff. Animals can be injured by trying to get away from the veterinary staff, such as a horse receiving a laceration on a protruding nail. Two dogs in a vet office might get in a fight while passing each other. And clients will blame the veterinarian and the staff for injuries an animal may receive while in the vet's care. To avoid discomfort for the animal veterinarians should use the least amount of restraint for a procedure as possible.

Without proper restrain an animal can injure itself during and/or after a procedure. Such as an injury if an animal moves while receiving an injection. Or an animal removing its stitches without the use of an Elizabethan collar.

Clients often base their impression of the care their animal receives on the manner in which their animals are restrained.



Without proper restraint an animal can injure the staff; Injuries may result in loss of income or efficiency; Bites and scratches from small animal; Kicks and body slams from large animals.

The goal of restraint is to handle an animal in such a way that a procedure can be done without injuring the animal and without causing any injury to the humans involved in the procedure.

In general, restraint is required for:

- many production and management practices, such as :
 - Health care: physical examination, sampling and therapeutic procedures
 - Identification: ear tagging, tattooing, branding
 - Weighing
 - Breeding
 - Showing
 - Transportation
 - Pregnancy diagnosis
 - Implanting growth stimulants
- Safety
 - Animal
 - Persons
 - Equipments/facility
- Animal escape
- Success of a procedure
- Wise use of resources
- Time management

Complications of restraint

Restraint is required for proper transportation, examination and treatment of any animal species.

The degree of restraint required reflects:

- The species and/or breeds
- The animal's familiarity with handling
- Anticipated invasiveness and
- The duration of the procedure

It is the handler's responsibility to use appropriate techniques that facilitate the success and safety of all humans and animals involved in a procedure. Unfortunately, despite all attempts to minimize complications, restraint can adversely affect some animals.



Undesirable effects that can be associated with restraint include:

- Trauma, including contusions, bruising, lacerations, and nerve paralysis
- Metabolic disturbances: acidosis, hypoxia, hypocalcaemia, hyperglycemia, & hypoglycemia
- Hyperthermia
- Regurgitation
- Pregnancy complications and displaced abomasums
- Pneumonia and bloat
- Emotional stress

HANDLING AND RESTRAINT OF CATTLE

- Bovine in species
- Large ruminant herbivore
- With various types:
 - Cow: female of reproductive age.
 - Bull: intact male of reproductive age.
 - Calf/calves: young cattle of either sex.
 - Steer: neutered adult male.
 - Beef: meet derived from adult cattle.
 - Veil: meet of young calf

Danger Potential:

- Cattle resist restraint in several ways:
- Horned animals are capable of causing severe injury using quick thrusts sideways and forwards; handlers need to be aware of the arc of the swing at all times.
- Butting with the head is a danger in both polled and horned cattle and handlers can easily be knocked down or crushed against fences or walls.
- Cattle seldom use the front feet as weapons, although they may paw the ground to display aggression. However, they can cause fractures or severe bruising when stepping on feet, and even small calves can inflict pain.
- Cattle are adept at kicking with their hind feet. They usually kick forward and out to the side and can reach a good distance. Although they seldom kick straight backwards, they are able to do so.
- The tail, especially when debris is tangled into the switch, can also be a weapon, especially if flicked into the handler's eye.

- Different breeds of cattle vary greatly in the amount of restraint needed.
- Dairy cattle are in general much more docile, sometimes only requiring a halter or stanchion. Beef cattle, usually handled much less, require more restraint, such as the use of a chute or stocks.



Physical Restraint

Rope Halter:

A rope halter is the basic tool of restraint for cattle. Commercial cow halters are available. It is important to place the halter on the cow correctly.

Often a handler will try to place the halter on upside down, or it is placed improperly with the rope behind the horns, but not behind the ears. The rope should tighten under the chin, rather than behind the poll.

In a stanchion or chute, it is fairly simple to place a halter on the cow, but in a box stall it is more of a challenge. If the nose loop is made larger than the poll loop, the cow can sometimes flip the poll loop over the head, allowing the nose loop to drop down over the nose and under the chin. When the rope is pulled the nose loop will tighten.

Once the animal is haltered, the rope should be tied to a secure object (e.g. a post). If the cow is in a head gate, the head should be pulled to the side and secured with a quick release knot. It is the primary method of restraint used in dairy cattle is the halter.

The halter is sometimes used in beef cattle to control the head after the animal is restrained in a chute. The halter can be made of cotton, nylon, twine, etc.

It is mainly used to control the head and once the head is controlled, the animal can be handled with relative ease.

The proper placement of the halter is important and it begins with making sure the lead is placed on the left side of the animals head.

A simple rhyme to help remember how to correctly place the halter on the head is a follows; "the part that draws goes under the jaws." This leaves the top part of the halter to go over the poll and behind the ears.

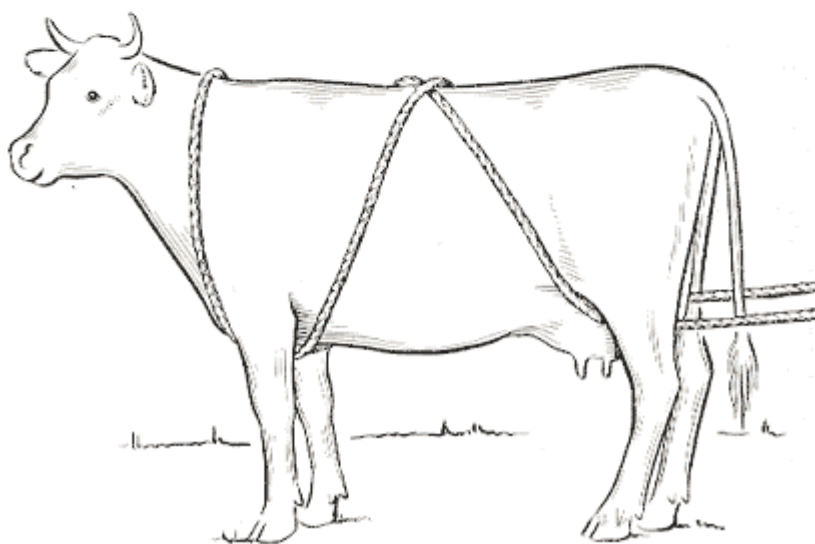
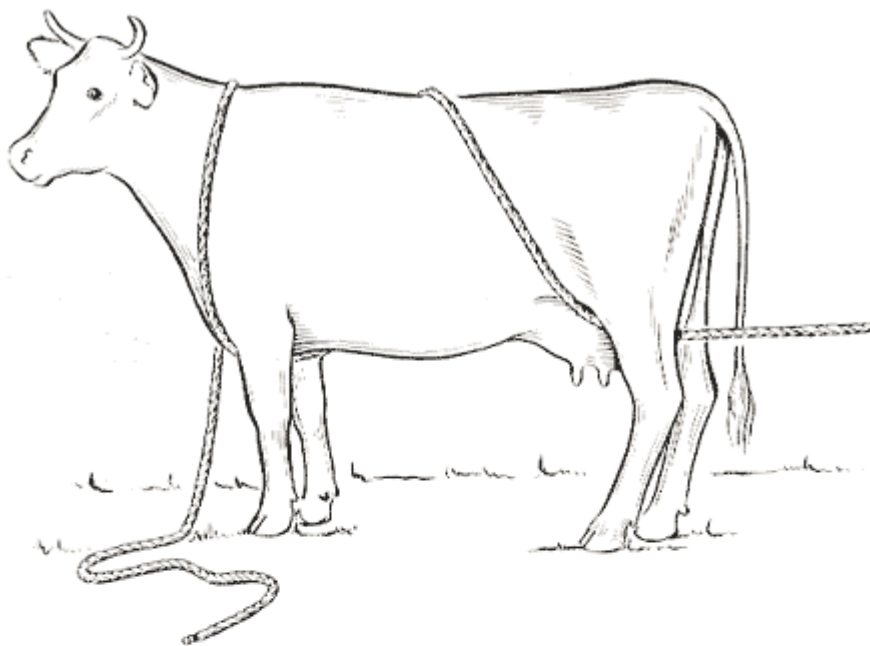


Fig. Restraining for pregnant animal



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is restraint?(6 points)
2. Mention type of restrain advised by pregnant animal(6 points)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



**Operation Sheet-1****Prepare personnel for pregnant animal health care work****Methods**

1. Clean your hands with detergents
2. Disinfect your hand
3. Wear sterile glove
4. Do animal care activity
5. Dispose wastes
6. Clean non disposable materials and replace to its original place
7. Remove gloves safely
8. Clean and disinfect your hand again



LAP Test	Practical Demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2 hours.

Task-1: Prepare PPE required for safe work

Task-2: Do personal and animal preparation

Task-3: Do restraining for pregnant animals



This learning guide is developed to provide you the necessary information regarding the following content Recording Information on quality and other indicators of production performance.

- Checking animal records and confirming the stage of gestation
- Reporting additional assistance required for assessing pregnancy status to the supervisor for remedial action
- Maintaining a clean, safe and secure environment for pregnant animals.
- Providing adequate nutrition and supplementary feed to pregnant animals as instructed, and recorded accordingly
- Observing the condition and health status of pregnant animals and recording and reporting any abnormalities
- Identifying signs of approaching birth in animals
- Giving female animals' access to shelter to give birth in severe weather conditions.

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:**



- Check animal records and confirming the stage of gestation
- Report additional assistance required for assessing pregnancy status to the supervisor for remedial action
- Maintaining a clean, safe and secure environment for pregnant animals.
- Providing adequate nutrition and supplementary feed to pregnant animals as instructed, and recorded accordingly
- Observing the condition and health status of pregnant animals and recording and reporting any abnormalities
- Identifying signs of approaching birth in animals
- Giving female animals' access to shelter to give birth in severe weather conditions.

Learning Instructions:

8. Read the specific objectives of this Learning Guide.
9. Follow the instructions described below 3 to 6.
10. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
11. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -6, 9, 12 and 14** respectively.
12. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” **in page -15.**
13. Do the “LAP test” **in page – 16** (if you are ready).



Information sheet-1	Checking animal records and confirming the stage of gestation
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1.1 Breeding records

- Breeding records are needed to evaluate breeding efficiency of the animal and determine number of services per conception, none return rate, stage of pregnancy and calving interval.
- The service or insemination date must record including the code and breed of bull to avoid problems of inbreeding and know the percentage of cross breeds that is the base for improvement of fertility in future.
- It should be known that, breeding efficiency of the animal also determined by , the efficiency and ability of the inseminator, and the fertility and quality of the semen.
- Information needed to be recorded also include: the history of previous births and present birth including duration of gestation, history of illness or abnormal discharge in the last few days, duration and signs of labor, number of offspring born - live and dead, interval between births, intensity and pattern of straining, and removal of placenta within normal range or not
- Vaccination of pregnant animals for the prevention of some infectious diseases has been mentioned previously, however, these vaccinations depend on whether or not, the disease is prevalent and the species-specific requirement. Pregnant mares however, need to be essentially given tetanus antitoxin or tetanus toxoid during gestation and immediately after foaling. Special attention need to be attached to the hygiene at the time of parturition and as such, animals must be shifted to hygienic parturition stalls and this would also prevent overcrowding.

1.1.1 Reason for Keeping Records

Farm records are kept for all or some of the following reasons:-

- . **To satisfy the Receiver of Revenue**



This is an essential requirement of record keeping but should not be the sole reason, and a record system can be designed which satisfies the Receiver and is also useful for other purposes.

. To assist in financial planning decisions

Financial records, in more detail than those required for the Receiver, can be used for cash flow planning, enterprise analysis and other purposes.

- **To control labor**

This is usually a wages book recording days worked, wages paid, money owed, leave *etc.*

- **To assist in land management decisions**

These include farm maps and grazing, irrigation, fertilizer use, crop yield, areas and management operations records.

- **To assist in livestock management decisions**

These are the records of individual animals and groups of animals, their production, health, feed use *etc.*

- **No logical reason**

A lot of useless information is often kept which is never, or can never, be converted into useful information.

1.1. .2 Criteria for Record Keeping

The brief summary of record types given above illustrates that several sets of records must be kept, inevitably involving much of the farmer's time. Hence, if records are not to be more trouble than they are worth, they should satisfy the following criteria:

- **They must be useful**

Unless data which is being recorded will at some future time be used (turned into information) in making management decisions it should not be recorded at all.

Records must be kept in such a form that they can be easily converted into information

Before keeping a record, the eventual end use must be decided upon so that the form in which the data are recorded will facilitate later analysis and interpretation. Too often the end use is not considered, and the usefulness of the data is severely impaired.



Record keeping systems must be simple

Dairy farmers have enough to do without burdening themselves with complex record keeping systems, which are difficult to understand and time consuming to complete, and therefore nearly impossible to delegate to employees.

Duplication must be avoided as much as possible

Some data may have to be recorded more than once in different forms, but this must be reduced to a minimum. In other words, if a record is to be made in the field, the recording system should be such that data can be conveniently entered in the field and does not have to be re-entered back at the office.

Records must lead to actions being taken

Unless a record is specifically intended to be used for some future action or in management planning it should not be kept.

Confirming the stage of gestation (pregnancy)

Pregnancy also named gestation is formation of embryo from joining of sperm with the egg, embryo attached to the wall of the womb by a navel cord and grows within a bag. If male and female animals have been allowed to run together in a large herd it will be difficult to determine the expected time for birth (parturition) in natural mating and extensive farming. However, in intensive farming, you do know when a female was mated or given artificial insemination provided enabling to determine stage of gestation and when she animal give birth.

Signs of pregnancy include stopping of sign of heat/estrus/ Heat stops when pregnancy begins; the animal becomes quieter and the belly grows bigger and dropping of the production of milk gradually in lactating animals.

The length of pregnancy differs in different animals. There can be a few days difference either way depending on the type, climate, feed and other factors

Animal	Length of pregnancy
Cow	280 days
Buffalo	320 days
Sheep	150 days
Goat	150 days



Average length of gestation

Species	Length in Days	Avg. in Months*
Cattle	279-292	9
Goats	145-155	5
Sheep	144-151	5
Swine	112-115	3 mo. 3 wks. 3 days
Horse	330-342	11



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Mention information must recorded to determine stage of pregnancy (4 points)
2. What are signs of pregnancy(4 points)
3. The length of pregnancy of sheep is similar with that of _____(4 points)
 - A) Cow
 - B) Buffalo
 - C) Goat
 - D) None

Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet-2	Reporting additional assistance required for assessing pregnancy status to the supervisor for remedial action (Pregnancy test)
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Concept of pregnancy test

Pregnancy testing in cattle has evolved over time. The simplest and most definitive test for pregnancy is to wait until the cow gives birth to the calf. This approach is perhaps acceptable for extensive systems but for intensive systems waiting until calving to identify the pregnant or nonpregnant (open) cows takes too long.

2.1 Methods of pregnancy test

2.1.1 Rectal palpation

The desire for an earlier pregnancy diagnosis led to the routine use of rectal palpation of the uterine contents for the purpose of detecting the pregnancy. Although traditionally practiced from 40 to 60 days after insemination or later, pregnancy diagnosis by rectal palpation can be pushed to its limit of detection (30 to 35 days after insemination) to identify open cows sooner.

2.2 Using transrectal ultrasound

Additional sensitivity can be achieved by using transrectal ultrasound for pregnancy detection. Transrectal ultrasound can be used as early as 25 days after insemination but is more typically applied after day 30 (Fricke, 2002). If performed later (60 to 80 days) then the sex of the calf can be determined when ultrasound is used. Although ultrasound represents a definitive test for pregnancy and can be used to determine the sex of the calf, it requires specialized equipment and the examination generally requires more time than rectal palpation. Regardless of whether rectal palpation or ultrasound is used, an individual with highly specialized training performs the diagnosis.

This individual is typically a veterinarian or, in some cases, may be a reproductive specialist that is an employee of the farm. A changing cattle industry may affect how pregnancy diagnoses are performed in the future. Intensification of reproductive management in beef herds and the implementation of AI are creating the need for



more accurate and timely diagnoses of pregnancy. At the same time, there is a shortage of large animal veterinarians in some regions. The shortage of large animal veterinarians has put pressure on a limited number of experienced veterinarians to complete a large number of pregnancy diagnoses. In some cases there is the desire to perform the pregnancy exams sooner after insemination so that non-pregnant cattle can be identified earlier and resynchronized for a second AI.

2.2.2 Laboratory (Chemical test)

Collectively, these factors are creating an opportunity for the application of chemical pregnancy testing (for example, blood tests for pregnancy). Indeed, a recent report cited rapid growth in the application of one blood test for pregnancy. The cattle industry is clearly moving toward alternative methods of pregnancy diagnosis that do not require skilled practitioners or specialized equipment.

The human pregnancy produces copious amount of a hormone called hCG (human chorionic gonadotropin) that passes into the urine and can be detected by a simple lateral flow ELISA test. This test is done by women in their homes. Unfortunately cows do not make bovine chorionic gonadotropin (or any such molecule that is readily detectable in the urine) so a simple test that is similar to the human test is not available. There are, however, a series of candidate molecules associated with pregnancy in cattle (Figure 2). These molecules include: “early pregnancy factor”, interferon-stimulated gen (ISGs), progesterone, and pregnancy-associated glycoproteins (PAGs).



Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are importance of pregnancy test (6 points)
2. Which is not included in chemical or laboratory test (4 points)
 - E) hCG
 - F) Rectal palpation
 - G) ISGs
 - H) PAGs

Note: Satisfactory rating - 5 points

Unsatisfactory - below 5 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet-3

Maintaining a clean, safe and secure environment and for pregnant animals.

3.1 Providing adequate shelter

The housing for pregnant animal should be: regularly sanitized animal barn; Comfortable bedding; non-slippery floor; well ventilated room and secured from predators

In the context of general management the factors of importance includes adequate house space, satisfactory ventilation, facilities for treatment and disposal of wastes. An investigation of the breeding programmes may reveal features of significance when line breeding has led to the appearance of inherited genetic defects. Calving programmes should be arranged to avoid the incidence of ketosis, hypomagnesaemia, calf scour and pregnancy toxemia.

All pregnant animals should be kept close to home towards the end of the pregnancy and some form of shelter should be provided. They should be watched twice a day for signs that parturition is close. In particular cattle and buffalo need a clean, well ventilated place, preferably with a sand or grit floor on which suitable bedding is placed.

Do not keep a pregnant animal constantly tied up or with little room to exercise in. Allow her some freedom in a field or yard each day. She should be observed closely twice a day for signs of parturition.

3.2 Identifying environmental and climate influence on their health

The examination of an animal must be accompanied by a consideration of its surroundings and circumstances. This is more necessary in the case of animals in groups than for individual animals. The consideration of the surroundings and circumstances should include an enquiry into such aspects of animal: husbandry, nutrition, breeding policy, housing, climate, etc



(A) Environment: meticulous examination of the environment may give a fair guidance to diagnose the forthcoming illness of a single animal and a fair percentage of animals in a herd.

Examples: -- Marshy land and stagnant pool encourages the spread of vector-borne diseases such as African horse sickness, fasciolosis, schistosomosis

- Damp soil permits soil-borne diseases such as anthrax, blackleg
- Presence of old flakes of paint or recent painting may be valuable knowledge in relation to lead poisoning.
- Algae in stagnant pools, ponds or shallow lakes may contain neurotoxic and hepatotoxic agents.

(B) Climate

Climatic conditions have influence on many diseases. The relationship between temperature high rainfall and clinical fasciolosis in sheep and cattle is well recognized. Similarly, warm humidity has an important influence on the larval stages of the internal nematode parasites that cause gastroenteritis and parasitic bronchopneumonia.

Intermittent periods of warmth, wet weather and cold moist conditions during the spring season may favour the appearance of hypomagnesaemictetany in cattle and sheep. A period of drought may be sufficiently prolonged to vitamin A deficiency in animals grazing in the dried out herbage.



Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are requirements in housing of pregnant animal (4 points)
2. What kind of care is needed for pregnant animal at about end of pregnancy (4points)
3. What is the role of considering environment and climate in health of animal

Note: Satisfactory rating - 4 points

Unsatisfactory - below 6 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet-4

Providing adequate nutrition and supplementary feed to pregnant animals

4.1 Importance of feeding care for pregnant animal

Pre parturient Care of the mother throughout the gestation and especially during the last part, the nutrition of the pregnant animals is important. Feeding of animals should be oriented in such a way that the prepartum or parturient incidence of some of the commonly occurring metabolic disorders is minimized, a healthy viable progeny is produced and the milk production of the dairy type animals is optimum. It is beyond the scope of this book to discuss all of these strategies in detail. In dairy cattle, farmers often feed their pregnant cows with concentrates only during the last few days of pregnancy and often vegetable oil is added to the concentrates. Although growth of the fetus occurs maximally during the last part of gestation, however, the value of such oil feeding is not beyond doubt. Recent suggestions for feeding of pregnant dry cows include the feeding of high-fiber low-energy chopped straw and the feeding of anionic salts in combination with adequate calcium and magnesium and restriction of rumen degradable protein. Extra energy feed is required for sheep and goats that have been diagnosed to be carrying twins. The feeding of the bitch should be aimed at increasing the energy intake during the last four weeks of pregnancy and 1.0 –1.8% calcium and 0.8-1.6% of phosphorous should be included in the diet of late pregnant bitches

4.2 Different category of animal feed

Supplements: are feedstuffs that are added to the ration of animals to satisfy the nutritional requirement of animals to the level of production targets, since, such feedstuffs containing the required amount and proportion of nutrients.

The cow utilize nutrient for maintenance of her body, for growth as long as she is immature, for the development of her unborn calf during pregnancy, and for milk production after parturition. If the ration is balanced by the addition of the required amounts of other nutrients, feed will not be wasted and more economical production will result.



Balanced Ration: is defined as one that supplies in their correct proportion all the food nutrients necessary to nourish the animals properly and to meet the requirements for her milk production during the 24-hour period.

Since pastures are roughage, they are not enough to satisfy dairy animals with nutrients needed for production. Pastures are roughages characterized by low in nutritive value, low in palatability, and low in digestibility. As a results of this these types of feedstuffs could not be satisfy the nutritional requirements particularly of high producing dairy animals especially in the drought season of the year. Therefore, one should consider supplementation of the ration with feedstuffs containing nutrients required in a proper amount and proportion for desired level of milk production.

Classification of Dairy animal Feeds	
Roughages	Concentrates
<p>Succulent roughages</p> <p> __pasture</p> <p> __fodder crops</p> <p> __tree leaves</p> <p> __silages</p> <p> __tubers and root-crops</p> <p> __forages and tree</p> <p>Dry roughages</p> <p> __crop-residues</p> <p> __grass</p> <p> hay</p> <p>Characterized by:</p> <ul style="list-style-type: none"> * These are lower in nutritive value * Lower in digestibility * Lower in palatability * Higher in crud-fiber, * Lower in crud-protein, and * Generally, lower in total digestible nutrients (TDN) * They are termed as bulky 	<p>Energy rich conc. concentrates</p> <p>almost plant origin conc.</p> <p>__cereal grains</p> <p> -maize cake</p> <p> -wheat</p> <p> -barley, cake,</p> <p> - rice</p> <p> -sorghum, etc.</p> <p>__agro-industry by-products pro.rich</p> <p> - wheat-bran</p> <p> - wheat-floor</p> <p> - wheat-millings</p> <p> - molasses</p> <p>Protein rich</p> <p>plant-origin protein rich conc.</p> <p>__Oil-seed meals</p> <p> - noug-seed</p> <p> - cotton-seed cake</p> <p> - sun-flower</p> <p> - etc.</p> <p>__animal-origin</p> <p> -meat-meal</p> <p> -blood-meal</p> <p> -fish-meal</p> <p> poultry-by</p>



foods.	<p>products</p> <ul style="list-style-type: none"> - bag gasses <p>products & yeasts</p> <p>_Roots and Tubers leaves</p> <ul style="list-style-type: none"> -sugar beet -potatoes -yams, and etc. <p>_ Brewer's by-</p> <p>_Legumes and tree leaves</p> <ul style="list-style-type: none"> - beans - peas - soya-beans <p>Characterized by:</p> <ul style="list-style-type: none"> ★ Higher in nutritive value (>60%) ★ Higher in digestibility, ★ Higher in crud-protein (>18%), ★ Higher in total digestible nutrients (TDN),and ★ Lower in crud-fiber (<18%)
--------	--

4.3 Role of nutrition for their health

Nutrition related diseases are, in most instances, group problems, so that a number of animals are more or less simultaneously affected. During the grazing season, a study of the pasture composition, along with identification of specific poisonous species, including ergotised grass or rye is advisable in certain circumstances.

Stall- fed animals, in comparison with pasture animals; a nutritional deficiency may exist for quite a time before it is identified. A sudden change from stall to pasture feeding may predispose to hypomagnesaemictetany. Grazing animals, more particularly when adolescent, are exposed to risk of acquiring various parasitic infections, e.g., parasitic gastroenteritis, lungworm infestation, and strongylosis in horses.

Housed animals are exposed to the risk of being under or overfed or of receiving diets which are incomplete or inadequate in respect of some essential constituents. Imported feedstuffs, particularly those of animal origin, are possible sources of entry for such conditions as FMD, swine fever, anthrax and salmonellosis.



Self-Check -4	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Discuss why feeding for pregnant animal is mandatory (4)
2. Define supplements and balanced feed ration (6 points)
3. Give at least three examples for roughage and concentrate feed categories(4points)

Note: Satisfactory rating - 7 points

Unsatisfactory - below 7 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet -5	Observing the condition and health status of pregnant animals and recording and reporting any abnormalities
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5.1 General observation

i. Distinguishing Marks

The distinguishing features of an animal should be carefully noted at the beginning of the examination when the general inspection is made, in order to establish its identity. Accurate identification of the patient is essential for group disease records and in situations where a different veterinarian may make a subsequent visit. The data required include: name and address of the owner, species, breed, sex, age, height or size, colour, horned or polled, brands, tattoo, ear marks, etc.

ii. Physical Condition

It is recognizing body build of an animal and judged by inspection and digital palpation by giving attention to all body prominences, ribs, shoulder, and blade, spinous process of cervical, thoracic and lumbar vertebrae. Besides, dewlap, brisket, thigh muscles and perineal regions should be viewed and judged. From the pathophysiological and nutritional stand point the physical condition can be demarcated as follows:

Normal-in normal animals, all the body prominences of the skeleton are adequately covered with well developed muscles and cushioned fat. The body has normal symmetry.

Fatty (obese)-it is a pathological deposition of a fat. There is abdominal protrusion and body assumes round shape.

Lean (thin)- in lean or thin animals, various parts of the skeleton are prominent (e.g, ribs and pelvis) and the supra orbital fossa are deepened.

Emaciation- in emaciated animals, there is wasting or atrophy of the muscles and bones are very much prominent with depression of supra-orbital fossa. The difference between thinness and emaciation is only of degree.

Hide bound:-there is prolonged emaciation, lustreless with dry leathery skin and reduced elasticity of the skin.



Cachectic (walking skeleton): - prolonged muscular atrophy with deeply sunken eyes is the feature of this state of health. The animal remains with skin and bones, due to this fact it is also termed as “the walking skeleton”.

lii. General Demeanour

General demeanour of animals is a useful indication of nature of disease and it is the response of the animal to external stimuli. In the case of animal in a herd or flock, separation of an individual may be an indication of disease.

Classification Of Demeanour

1. Normal (bright) demeanour
2. Abnormal demeanours

Normal (bright): when, on being approached, an animal make a normal response to external stimuli, such as movement and sound, the demeanour is said to be normal (bright). Normal reaction under these circumstances may consist of elevating the head and ears, turning towards and directing the attention at the source of stimuli, walking away and evincing signs of attack or flight.

Abnormal demeanour

1. **Decreased response (depression):** this has three stages.

A. dull (apathetic):- this state is appreciated by the reactions to normal stimuli being sluggish or retarded, or even somewhat suppressed.

B. dummy state- this state is an advanced degree of failure to respond to external stimuli although the animal remains standing, and is capable of movement. Encephalomyelitis in horse, and listeriosis and occasional cases of lead poisoning and ketosis in cattle have these signs.

C. Comma- the most advanced degree of apathy (depression) is comma, in which the animal is unconscious and fails to respond to painful stimuli, as in the cow in the advanced stages of parturient paresis (hypocalcaemia) and pregnancy toxemia.

2. Excitation or increased response

a. Apprehension (mildly anxious): - the animal appears alert, looks about constantly, but exhibits normal movements. It may arise due to slight constant pain, in serious defects of vision and the early stage of parturient paresis or hypocalcaemia.

a. Restlessness:- it is a more severe state in which movement is almost constant, consisting of lying down, rolling, getting up again, looking at the flanks, kicking at the



belly and groaning or bellowing. This form of behaviour is usually caused by sharp intermittent or constant pain, as in colic syndrome in horse.

c. **Mania**: in mania the behaviour aberrations appear to compulsive and include vigorous licking of some specific parts of the body surface (ketosis, pseudorabies). Pressing forwards with the head (meningitis) or licking or chewing inanimate objects.

d. **Frenzy**:- when frenzied, the animals' actions are uncontrolled as in acute lead poisoning, hypomagnesaemictetany and rabies.

iv. Gait

It indicates the locomotors process of an animal. **Locomotors disturbances are seen when the animal moves about voluntarily, or is led or driven at various paces, towards or away from the clinician**

Table: diseases that affect locomotion

Gait	Disease/disorder
Walking in circle	Coenurosis(gid) Otitis(dog/cat)
Enzootic ataxia	hyocuporosis
Goose stepping gait	Heart water in calf
Painful limb movement (lamness)	Laminitis Foot rot



v. Posture

It denotes the anatomical configuration when the animals remain in stationary situation. How does it stand? How does it sit? How does it lie?

Examples that indicate abnormalities of posture

Kyphosis – it is dorsal bending of the spinal column.

Lordosis – it is ventral bending of the spinal column.

Dog-sitting-position in acute gastro-distention in the horse, pain and pressure on the diaphragm cause the animal to adopt the “dog-sitting-position”.

5.2 Examination of feeding habits

Appetite or the desire to feeding is controlled by appetite centre in the hypothalamus. It is assessed by history and inspection of the animal in the presence of feedstuffs. Feed intake (prehension), mastication and rumination (in ruminants) give crucial clue as to the health status of the animal. In the inspection of the animal one can detect desire to take in feed but because of difficulty of mastication or deglutition it refuses to eat. This is caused by lesions in the oral and oesophageal regions; muscular paralysis of the associated muscles (e.g. tetanus) and defects of taste buds.

Absence of rumination in ruminants shows the presence of septicemic diseases or deprivation of feed.

Abnormalities in appetite

- a) Inappetance—is reduction of feed intake, caused by unsuitable feed, inability to prehend, masticate or swallow due to pain in the digestive tract and GIT diseases.
- b) Anorexia—is complete loss of appetite, caused by dietary deficiency like Co, submerged hunger sensation (due to fear, excitement or severe pain), toxæmia and GIT problems.
- c) Polyphagia—increased appetite, caused by diabetes, abnormality in absorption, excess starvation.



Polydypsea—increased water intake, caused by loss of body fluid.

d) Abnormal appetite—consumption of substances, which don't fall in the normal diet of that specific species of animal. It is sometimes known as **pica**.

Causes - nutritional deficiency—P, Ca, salt, Co, Cu, protein, bulk fibre

- Nervous diseases—rabies, ketosis

5.3 Sign of abnormality on reproductive organ

Female genital organs comprise the vulva, vagina, cervix, uterus and ovaries. Examination can be done by visual inspection, external palpation, internal palpation and the use of endoscopy. Symmetrical enlargement of Vulva is normal in oestrus and few days before parturition. It is pathological in ovarian cyst and inflammation. Regarding discharges from reproductive organs Bloody to thin mucoid discharge shows the beginning of oestrus. Tough, glass mucous indicates the impending of parturition. Thin and dirty to thick, yellow and mucopurulent discharge on the other hand is observed in vaginitis and metritis while foul smelling, dirty pink to yellowish discharge designates retained placenta.

Vaginal and cervical examination is accomplished by opening manually or with metal speculum and with the use of artificial light. The following can be detected: vaginitis, metritis exudates, cervicitis, and presence of faeces in recto-vaginal fistulas. The uterus and ovaries are examined by rectal palpation.

Mammary glands and teats are examined by visual inspection and palpation. Different forms of mastitis may have different characteristic changes in the udder and milk. Swelling of udder and teats, local hyperaemia, firm consistency of udder, and flakes or blood and any colour change in the milk can be detected. Milk samples can also be submitted to laboratories for bacteriological, biochemical and chemical examinations

5.4 Signs of abortion

The fetus and its environment are so damaged that survival is impossible and the contents of the uterus pass out through the cervix. In the larger species, some assistance may be needed to help the dam deliver the aborted fetus and normal obstetric methods are used for this. In the case of the dog and cat, abortion may occasionally pass unnoticed and the dam consumes the small conceptuses.



Once the process of abortion commences little can be done to stop it. In women, threatened miscarriage can be halted in some cases by bed rest, but this is not possible in animals. All cases of abortion should be investigated to ensure that there is not an infectious cause that could be transmitted to other animals. The cause should be assumed to be infectious and hygienic precautions taken immediately until a definitive diagnosis is available.

Note

Not all the litter are necessarily affected by adverse factors and some of the litter will die whereas the rest survive. If the majority of a polytocous litter die, actual abortion will probably occur. In other cases, the minority are affected and become mummified and are eventually delivered at the time the rest of the litter are born at term. The management of cases of late, partial abortion in the bitch is discussed in Chapter 9.

In dogs (and possibly pigs and cats) the phenomenon of *fetal resorption* can occur. Cases in which pregnancy has been confirmed are later found to be non-pregnant and yet no evidence of abortion has been observed. In other cases, the number of fetuses born is less than the number of fetuses clearly demonstrated by ultrasonography earlier in pregnancy. In such cases fetal tissues are believed to become autolyzed and 'digested' by scavenger cells in the blood. Resorption of part of the litter may occur in subsequent litters in some dogs and cats. Sequential ultrasonographic scans of such patients may demonstrate the death and eventual disappearance of individual fetuses, often at 4-5 weeks of pregnancy. The reason for such fetal deaths is not known but may be caused by lack of space for individual placentas. Plasma progesterone profiles of such patients usually remain at normal levels.



Self-Check -5	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Discuss general condition abnormalities (4)
2. What feeding habits need to be considered (4 points)
3. Mention positive findings for abnormalities on reproductive organ(4points)
4. What are signs of abortion?

Note: Satisfactory rating - 7 points

Unsatisfactory - below 8 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet-6

Identifying signs of approaching birth in animals

6.1 Signs of approaching parturition

Some externally visible changes do occur in animals when parturition is approaching. The most important external changes of approaching parturition are seen in the udder, vulva and pelvic ligaments and to some extent in the behavior. The symptoms are inconsistent between individual animals, and between consecutive parturitions. The symptoms therefore, do not permit an accurate prediction as to the exact time of parturition in a certain animal but are only useful indications as to the approximate time parturition can be expected. Clinicians must therefore refrain from too positive statements concerning the exact time of parturition.

6.2 Stages of parturition

For ease of description, parturition is divided into three stages. There is no clear demarcation between the stages, which normally merge with each other to become a continuous process. The length of each stage is quite variable. Before parturition a number of other preparatory changes such as mammary development and relaxation of the pelvic ligaments occur. The timing of these preparatory changes varies between individual animals, making them rather unreliable indicators of approaching birth.

The main *physiological events* of the three stages of labor are listed below:

- *First stage:*
 - relaxation and dilation of cervix
 - fetus adopts birth posture
 - uterine contraction commences
 - chorioallantois enters vagina
- *Second stage:*

- uterine contraction continues
- fetus enters birth canal
- abdominal contraction commences
- amnion enters vagina
- fetus is expelled

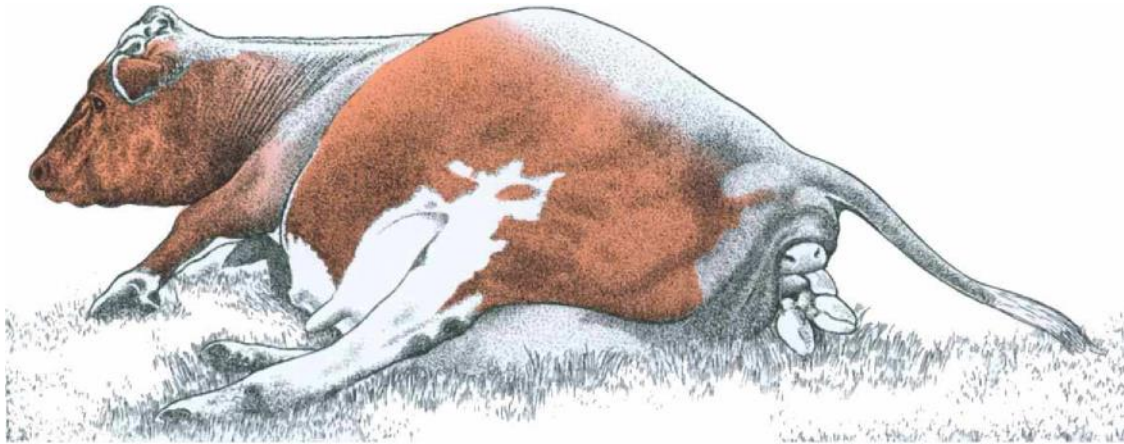


Figure 1.1 Early second-stage labor in the cow. The calf's muzzle is level with the fetlock joints of the forelimb. The amnion has ruptured and the calf's tongue is protruding. The calf's position has rotated about 45° from the dorsal position.



Figure 1.2 Late second-stage labor in the cow. The fetal head and part of the shoulders have been delivered.



Fig.1.3 Second-stage labor is complete. The cow has risen and is licking the calf, which is attempting to assume sternal recumbency.

- *Third stage:*

- placental circulation lost
- placental
- dehiscence and separation occurs
- uterine and abdominal contractions continue
- Placenta is expelled.

The fetal membranes are normally expelled within 12 hours of birth. Retention beyond 12 hours is often followed by a further period of retention lasting from 3 to 10 days unless the membranes are removed manually

Note- Separate birthing/calving pen or area is needed to ensure access to safe shelter and reduce damage by other animals during giving birth (delivery)

**Operation Sheet-1****Techniques of determining stage of pregnancy****Methods**

- Step-1: Demonstrate one dairy farm
- Step-2: Presence of appropriate records
- Step-3: Estimate stage of pregnancy based on history
- Step-4: Confirm stage of pregnancy by general examination
- Step-5: Confirm stage of pregnancy by rectal palpation
- Step-6: Confirm access to safe environment and adequate nutrition





LAP Test	Practical Demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2 hours.

- Task-1: Record information related to this animal
- Task-2: Do general examination of pregnant animal
- Task-3: Do pregnancy test by rectal palpation
- Task-4: Provide nutrition for pregnant animal





Instruction sheet	Learning guide 41 #
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This learning guide is developed to provide you the necessary information regarding the following content Recording Information on quality and other indicators of production performance.

- Identifying hazards in assisting with birthing and following safe work practices
- Checking and preparing birthing equipment, resources and materials for use.
- Maintaining clean, safe and secure environment for pregnant animals according to the organizational guideline and as directed by the supervisor.
- Monitoring environment and animals to ensure normal birth progresses
- Identifying and reporting animals experiencing birthing abnormality supervisor.

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:**



- Identify hazards in assisting with birthing and following safe work practices
- Check and prepare birthing equipment, resources and materials for use.
- Maintain clean, safe and secure environment for pregnant animals according to the organizational guideline and as directed by the supervisor.
- Monitor environment and animals to ensure normal birth progresses
- Identify and report animals experiencing birthing abnormality supervisor.

Learning Instructions:

14. Read the specific objectives of this Learning Guide.
15. Follow the instructions described below 3 to 6.
16. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
17. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -6, 9, 12 and 14** respectively.
18. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” **in page -15.**
19. Do the “LAP test” **in page – 16** (if you are ready).



Information sheet-1	Identifying hazards in assisting with birthing and following safe work practices
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1.1 Identifying hazards in assisting with birthing and following safe work practices

During assisting birth clinicians and other personals can exposed to different hazards mainly biological hazards or Zoonotic diseases and physical hazards or injury as discussed in OHS module and learning guide.. To reduce exposure to biological hazards we need to use personal protective equipment like obstetrical glove. To reduce injury to human during birthing, the area should be comfortable and animal should be handled properly.

Most domestic animals are prone to maximum injuries and infections, some of them endangering the life of the fetus and the dam immediately, and some of them affecting the future productive and reproductive life of the mother. Therefore, due care must be exercised in advance and sufficient vigilance must be kept during parturition to minimize parturient problems. The veterinarian should be focused on minimizing case of dystocia.



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Mention the hazards during birthing to persons and how to reduce (5 points)

2. Discuss hazards to animals during birthing and how to reduce (5 points)

Note: Satisfactory rating - 6 points

Unsatisfactory - below 5 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

Information sheet-2	Checking and preparing birthing, equipment, resources and materials for use.
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Equipments or instruments required can be categorized as obstetrical, fetotomy, clinical or hoof and restraining materials.

a. PPE

There must be full personal protective equipments including arm length glove, overall, apron, boot, hat, etc

Protective Clothing and Equipment for Handling of Bulk Caustic Soda Solution.



b. Obstetrical kit

Obstetrical kits include vaginal speculum, forceps, scissors, and handlers (hooks) as observed in picture below

Obstetrics Instruments

Sort by: [Product](#) [Price](#) [Default](#)



Calf Puller

Our price: \$122.36
(€ 93.61)



Caming Forceps

Market price: ~~\$90.00~~
Our price: \$78.65
(€ 60.17), save 13%



Hook Handle

Our price: \$26.87
(€ 20.56)



Key Hook



Obstetrical Cable



Obstetrics Forceps

Swine Snare

Our price: \$72.65
(€ 55.58)

Our price: \$33.62
(€ 25.72)

Market price: \$120.12

Our price: \$86.35
(€ 66.06), save 28%



Polansky Vaginal Speculum

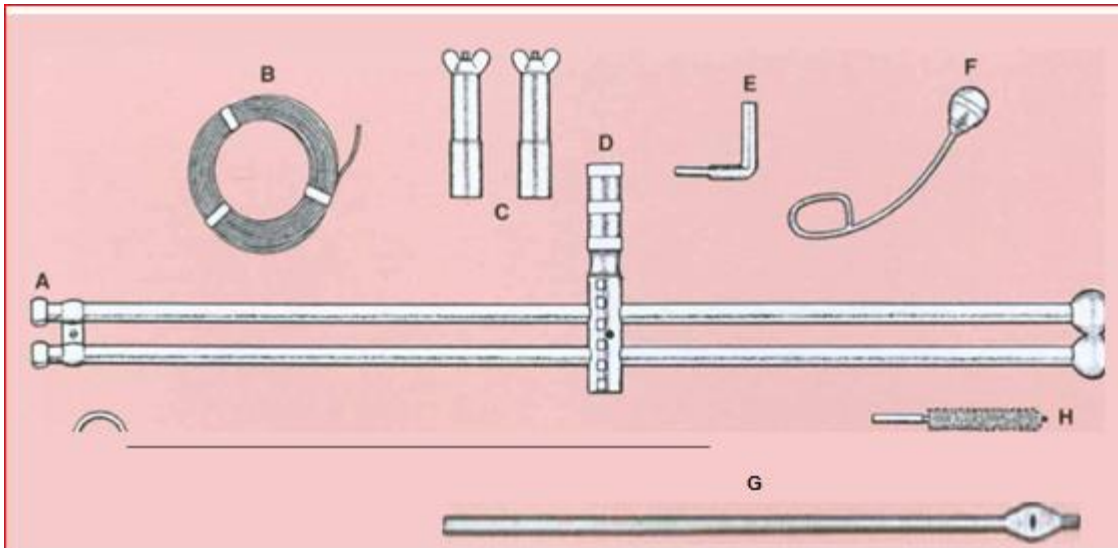
Market price: \$125.00
Our price: \$84.87
(€ 64.93), save 32%

Witt Obstetrics Forceps

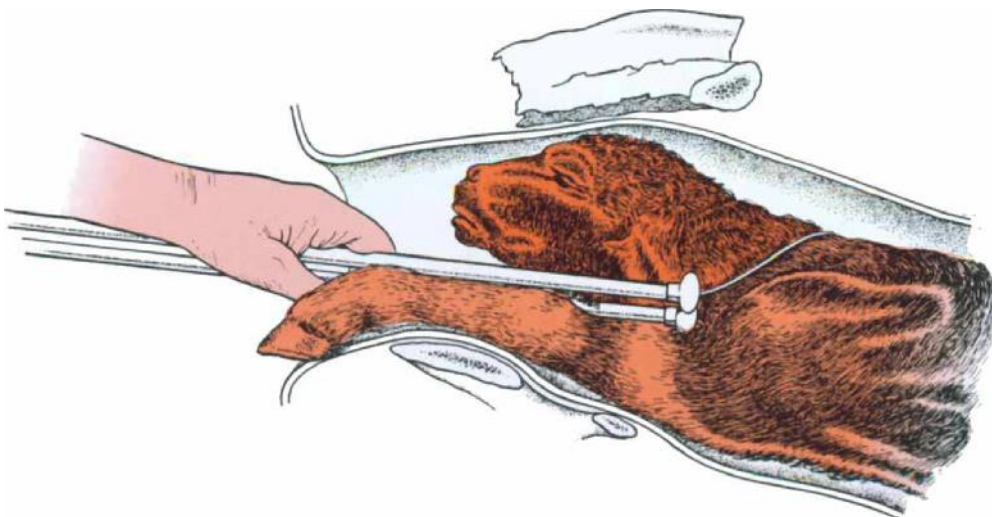
Obstetrics Hook

Market price: \$120.12
Our price: \$40.24
(€ 30.78), save 67%

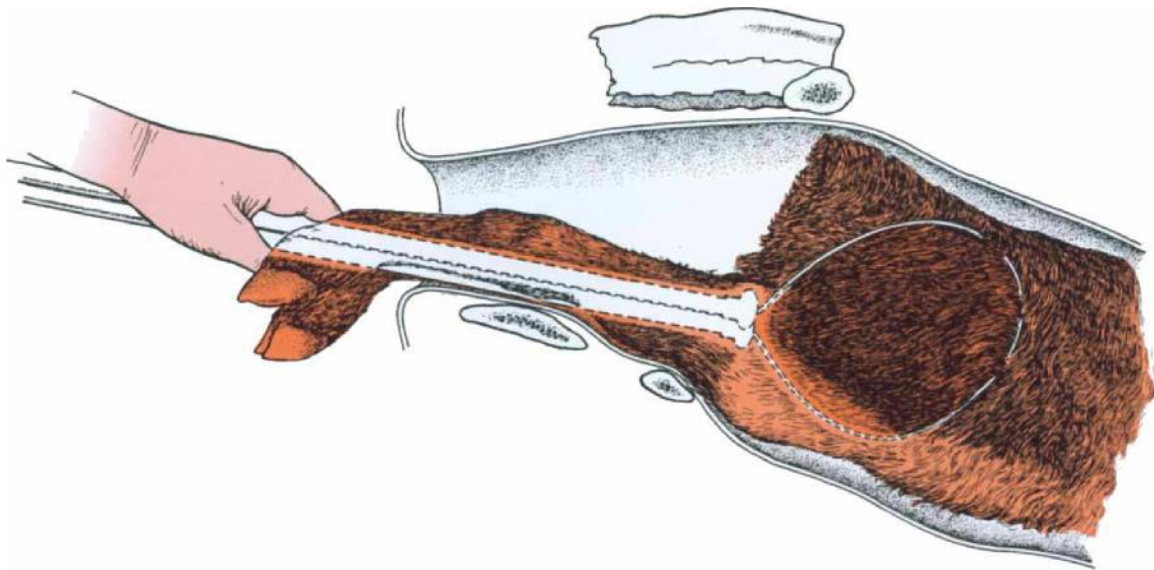
c. Fetotomy kit and its application



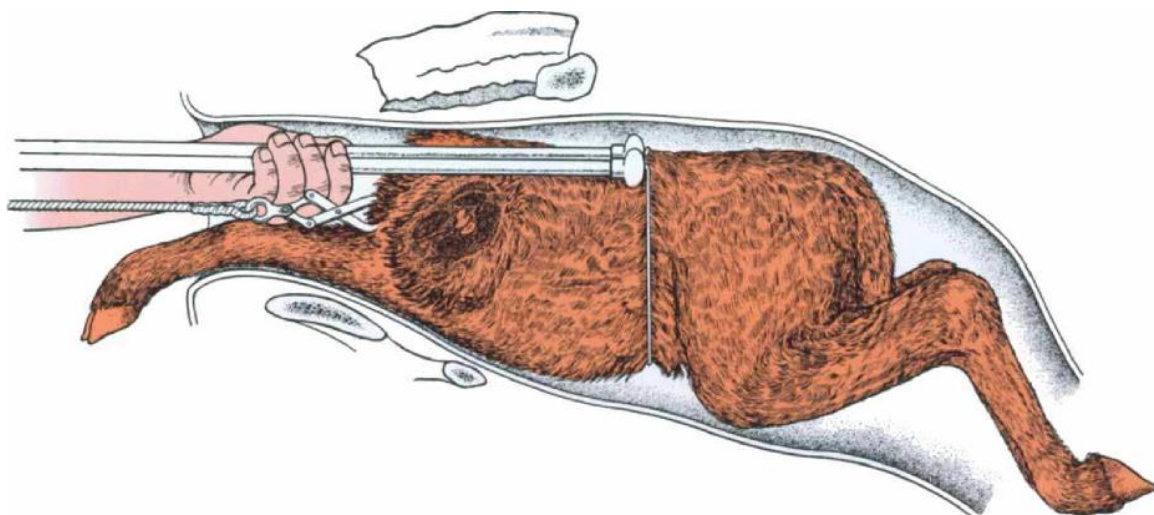
1. **Figure 12.1** Fetotomy equipment. (A) Tubular embryotome, (B) fetotomy wire, (C) handles for wire, (D) handle for embryotome, (E) screw to tighten handle, (F) introducer, (G) threader, (H) cleaning brush.



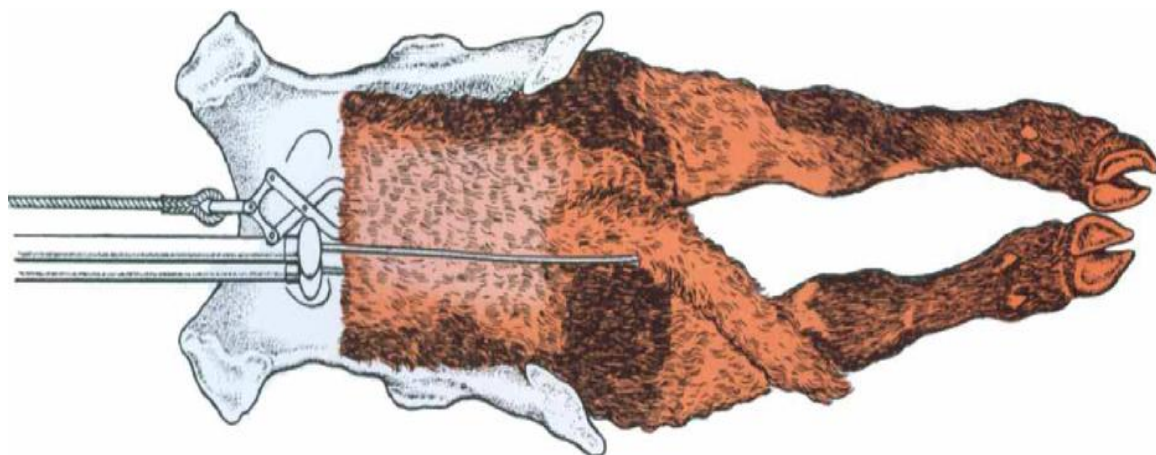
Removal of The Head.



Removal of a forelimb.



Removal of the thorax.



Splitting the pelvis (dorsal view).



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Mention personal equipments (4 points)
2. Mention obstetrical and fetotomy kits (4 points)
3. Discuss use of fetotomy (4points)

Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet-3

Monitor environment and animals to ensure normal birth progresses (Pregnancy)

3.1 Monitoring the pregnancy

Monitoring pregnancy and parturition include pregnancy diagnosis, general health of the animal as discussed in previous module.

- *Accurate diagnosis of pregnancy to determine* date of birth of the offspring
- *Diagnosing* litter size for species like sheep for prevention of pregnancy toxemia, this may predispose to fetal loss and dystocia.
- Careful nutritional management of those animals with multiple fetuses will help reduce the risk of pregnancy toxemia.
- Regular checking of plasma (3-hydroxybutyrate levels in ruminants provides a useful early warning sign of impending energy deficiency during pregnancy.
- In the mare, early diagnosis of unwanted twin pregnancy enables prompt action to be taken to terminate it or destroy one of the two fetuses.
- *Careful investigation and treatment of any maternal illness or abnormal signs during pregnancy at all ages using* ultrasonographic monitoring
- *Supervision of pregnancy:* to ensure that the mother is as free as possible from stress, nutritional deficiency or environmental stress.
- *Monitoring the fetus during pregnancy:* Using the ultrasonographic probe (either externally or per rectum, depending on species) to assess the fetus and its surrounding fluids in considerable detail.
- *Monitoring the hormonal support of pregnancy:* regular assay of plasma progesterone in animals with a history of habitual abortion
- *Rectal examination in cattle:* - to estimate the size of the calf and its presentation. *Using technology:* including ultrasonographic evaluation and the monitoring of fetal electrocardiographs.



3.2 Monitoring the birth process

- *Ensuring that proper facilities are available for the animal to give birth:* the facilities should allow sufficient space, protection, and comfort for the patient. They should also permit unobtrusive observation of the patient by her attendants, who should be able to monitor her progress without disturbing her. Facilities for catching and restraining the patient with ease for a more detailed obstetrical examination to be performed with minimum disturbance to the patient should be available.
- *Supervision:* the degree of supervision should increase as the anticipated time of birth approaches. In all species the external signs of approaching birth, although well documented, are variable, as are the lengths of the stages of normal parturition. In the mare, daily evaluation of various cations in the milk (if it is present in the udder) can be used to assess fetal maturity and the proximity of impending birth.
- *Observing the birth process:* when birth is underway its progress should be monitored unobtrusively to ensure that proper progress is being made. Inexperienced owners should be advised about the progress of normal birth and the variations that can occur.
- *Investigating abnormalities:* any apparent abnormality should be investigated and professional help sought without delay. Excessive interference should be avoided but in general it is better to examine a case prematurely than when it is too late.
- *Managing prolonged gestation:* the management of prolonged gestation is discussed in detail in the chapters on dystocia in the various domestic species. In some circumstances it may be necessary to induce birth and the methods for achieving this in each species are discussed below.

3.3 Induction of pregnancy

Pregnancy can be induced in prolonged gestation providing oxytocin and prostaglandin $F_{1\alpha}$ on the uterine muscles. The induced fetus may need special



care if it is immature and planning to ensure the availability of colostrums is important.

Importance of induction of pregnancy

- To terminate pregnancy in an animal mated 'by mistake', e.g. in a post pubertal heifer calf served by her father. Also in cases of mummified fetus.
- To avoid prolonged gestation and the probability of an oversized calf causing dystocia.
- To terminate an abnormal pregnancy like pregnancy toxemia, ventral hernia, etc
- To tighten the calving pattern in a herd.
- To time calving to coincide with grass availability (this happens in New Zealand).

Methods available for induction of pregnancy in cow

These are dependent on the stage of pregnancy and the speed with which it is required to induce calving or abortion.

Induction of parturition of up to 120 days gestation

Until 120 (range 100-150) days of pregnancy, maintenance of bovine pregnancy depends solely on the corpus luteum, after this stage the placenta is the main source of progesterone.

Treatment Prostaglandin F2a: cloprostenol 500 µg or dinoprost 25 mg both by intramuscular injection. Abortion is expected in about 3 days - the fetus may need to be removed from the vagina after it has been expelled from the uterus.

Induction of parturition of up to 120-250 days gestation



At this stage of pregnancy, induction is normally carried out to terminate an undesired pregnancy or to induce lactation at a time when good supplies of grass are available for the dairy herd.

Treatment Long-acting corticosteroid: e.g. 25 mg dexamethasone trimethyl acetate given by intramuscular injection. Abortion is expected in 14-16 days. Treatment is effective in 80-90% of animals. Dystocia due to fetal malpresentation may occur and the aborted fetus may require assistance to allow it to be delivered.

Although calves may survive after only 8 months gestation they may not do so unless they are at least 275 days gestation. Placental retention is less common following the use of the long-acting corticosteroids than after prostaglandins or the short-acting steroids. Colostrum production is often very reduced and anti-body absorption by the calf is poor.

Induction of parturition at 250-275 days gestation

Treatment

Medium-acting corticosteroid: e.g. 20-30 mg betamethasone given by intramuscular injection. Fetal delivery is expected in 5-11 days. If calving has not occurred by 5 days a further injection of either prostaglandin F_{2a} or short-acting steroid, e.g. 20 mg dexamethasone phosphate, may be given.

Induction of parturition at, near, or after term

Treatment

Medium-acting or short-acting corticosteroid and/or prostaglandin F_{2a}: e.g. 20-30 mg betamethasone or 500 µg cloprostenol given by intramuscular injection. Fetal delivery is expected within 3 days. Some claim that prostaglandin used alone may increase the risk of retained fetal membranes or even uterine rupture. At Cambridge, the author has successfully used a combination of 20 mg betamethasone and 500 µg cloprostenol (a prostaglandin F_{2a} analog) given at the same time by intramuscular injection. The cow would normally be expected to calve in about 26 hours. In general, the closer to the calving date, the quicker the onset of induction.



Preparations for induced calving in late pregnancy

- Ensure the farmer can maintain a close watch on induced animals in case calving difficulties arise.
 - Ensure the farmer has supplies of colostrums as some induced cows calve with little.
- Ensure good facilities for any premature calves, which are very susceptible to cold and to the risk of neonatal infection.
- Warn the farmer of the high incidence of retained fetal membranes, which will need veterinary attention, and that the next conception may be delayed as a result.



Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. How can you monitor pregnancy (4 points)

2. How can you monitor birthing (4 points)

3. What are chemical drugs used for induction in cow? (4points)

Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet-4

Identifying and reporting animals experiencing birthing abnormality

4.1 Abnormality in fetal development and pregnancy

- **Super fecundation-** occurs when the female served by more than one males (common in pigs)
- **Superfetation** -occurs when an animal that is already pregnant comes into estrus, is served, and conceives a second litter(common in pigs).
- **Telegony**-is the misconception that a pure bred animal mated accidentally by a mongrel may never breed true again. Believed occasionally by some dog and horse breeders.
- **Interspecies breeding-** between species may occur successfully in some cases, e.g. horse X donkey in which mule or lunney is produced.. The hybrids produced from these matings are normally sterile. erroneously that kittens have been born to bitches or puppies to queen cats.
- **Ectopic pregnancy-** fetal development outside the uterus which is common in humans.. The placentation of the domestic animals makes true ectopic pregnancy extremely unlikely, although periodic claims with no scientific basis that it has occurred
- **Death of the conceptus-** is vulnerable, especially in its early life, to various adverse factors that might kill it, inflict serious damage, or cause minor but non-life-threatening injury. There is evidence that, following service, 98% of cows actually conceive and yet few herds achieve a conception rate (evidenced by positive pregnancy diagnosis at 6 weeks) of greater than 50%. The remaining embryos do not survive.
- **Adverse factors affecting the conceptus**
- Genetic abnormalities involving either the autosomes or the sex chromosomes.
- Failure of hormonal support - especially progesterone.
- Failure of the maternal body to recognize the presence of the embryo.
- Environmental stress, for example extremes of temperature, starvation, radiation.



- Infection affecting the conceptus, its placenta or the uterus.
- Chemical factors, for example poisons and drugs (e.g. methallibure).
- Immunologic factors.

Note-The incidence of all these adverse factors in animals has not been fully investigated. In humans, fetal loss is believed to be caused by genetic abnormalities in 75% of cases. In animals, the incidence of genetic problems has received relatively little attention. The incidence of infectious abortion in the farm animals is documented in the reports of the Veterinary Laboratory Agency. In sheep, for example, approximately 55% of abortion cases are caused by infection.

- The fate of the conceptus when exposed to adverse factors depends on the severity and nature of the challenge and on the age of the conceptus.

		Adverse factors)	
		Embryo	Fetus
<ul style="list-style-type: none"> • Early or late embryonic death • (In early embryonic death there may be no sign that conception actually occurred. In the cow later 	<ul style="list-style-type: none"> • Fetus unaffected 	<ul style="list-style-type: none"> • Fetus unaffected 	
	<ul style="list-style-type: none"> • Fetus survives 	<ul style="list-style-type: none"> • Abortion • Fetal 	



Abortion- is removal the fetus before the end of delivery in form of bleeding. The fetus and its environment are so damaged that survival is impossible and the contents of the uterus pass outthrough the cervix.

Fetal anomalies-involve minor or major abnormalities in the fetus. They are usually not incompatible with fetal life. The term 'fetal monster' or 'monstrosity' is used to describe a fetus that has suffered severe physical damage usually affecting its appearance but not causing its death in the uterus.

- In cattle breeding, where artificial insemination can produce thousands of calves from one bull, any evidence of monsters sired by a bull should be reported to the owner of the bull in case hereditary factors are involved.
- Some monsters result in dystocia and examples of these and methods for their delivery will be discussed in subsequent chapters.
- Minor abnormalities - like polydactyly in cats - are relatively unimportant and are not life threatening. A large number of anomalies have been described and some of the more common ones are listed below:
- *Achondroplasia*: short-limbed 'dwarf' offspring, for example bulldog calves in Dexter cattle. Assistance with delivery is often required.
- *Anasarca*: fetal skin and subcutis are edematous. Serious problems at birth may be encountered.
- *Cleft palate*: seen in all species, especially puppies and calves.
- *Conjoined fetuses*: usually monozygotic twins ('Siamese twins') that have partially or completely failed to separate. The fetus may have two faces (diprosopus) or two heads (dicephalus). Many other partial divisions have been described. One of the worst in terms of dystocia is when the fetuses are joined at their hindquarters (pygodidymus). The fetus in anterior presentation may appear normal but cannot be delivered because the co-twin is attached behind. An abnormal monozygotic twin is the fetal mole (*Amorphus globosus*), which has an umbilical cord supplying a small structure of mixed fetal tissue surrounded by skin. It is usually an incidental finding at the birth of its normal co-twin and does not cause dystocia.
- *Entropion*: especially lambs. This is not life threatening but causes severe



eyedamage.

- *Imperforate anus*: especially piglets.
- *Muscular hypertrophy*: 'double muscling', for example in Belgian Blue cattle. This abnormality is selected on purpose in some countries because of the high value of such calves, which also have a very high rate of dystocia.

4.2 Fetal mummification

- One possible fate of the fetus that dies in utero is that it will remain in the closed uterus. Its fetal and body fluids will be resorbed and it will become mummified. The corpus luteum normally remains active and the dam does not return to estrus. In most cases the mummified fetus becomes dry and paper-like (papyraceous mummification). In cattle, another form of mummification, possibly of genetic origin, has been seen in Channel Island breeds. Hemorrhage occurs between the chorion and the endometrium, possibly as a consequence of fetal death and the dead fetus becomes surrounded by sticky fluid. This is sometimes known as hematic mummification.
- Fetal mummification occurs in all species. In the polytocous dog, cat, and pig a number of fetuses may become mummified but the rest of the litter remains normal. A number of small mummified fetuses may be delivered along with the normal living fetuses at term. In the mare, one member of a pair of (undesirable) twins may die and become mummified as the fetuses compete for uterine space. Eventually - often at 7 months into pregnancy - both twins may be aborted, one alive but unviable through prematurity and the other mummified. In the ewe, mummified fetuses are occasionally diagnosed when those members of the



flock that have not lambed are checked after lambing.

Fetal maceration-This occurs if fetal death is accompanied by loss of the corpus luteum, opening of the cervix and entry of autolytic and other bacteria into the uterus. The fetus decays in the uterus and its soft tissues break down and are passed as vaginal discharge with foul-smelling

- **Hydrops uteri**-The term implies excessive amounts of fetal fluids within the pregnant uterus. The fetus itself may or may not be edematous and may show anasarca, hydrothorax or ascites. Two forms of hydrops uteri have been described (depending on the site of excessive fluids): hydrops amnion and hydrops allantois.

Characteristics of hydrops amnion and hydrops allantois

	Hydrops amnion	Hydrops allantois
• Incide	• <i>n</i>	• 15n
• Onset	• Insidious	• Rapid
•	• 5-6 months	• 7-8 months
•	• Gestation	• <i>gestate</i>
• Calf	• Abnormal	• Normal
• Place	• Normal	• Abnormal
• Progn	• Guarded	• Poor
• Fluid	• Mucoid	• Watery
• Specif	• 1.08	• 1.02
• Nat-	• 120	• 50
• CI-	• 90	• 20

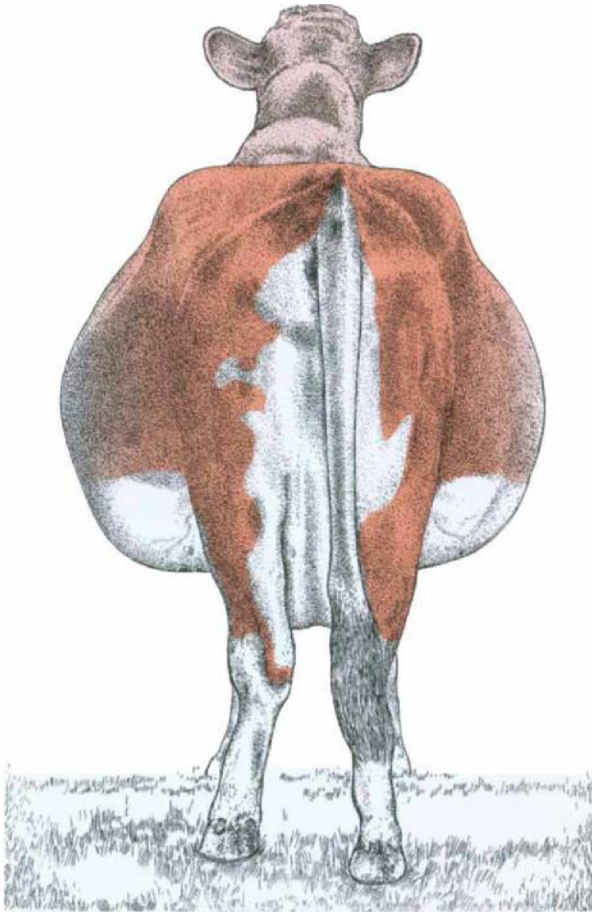
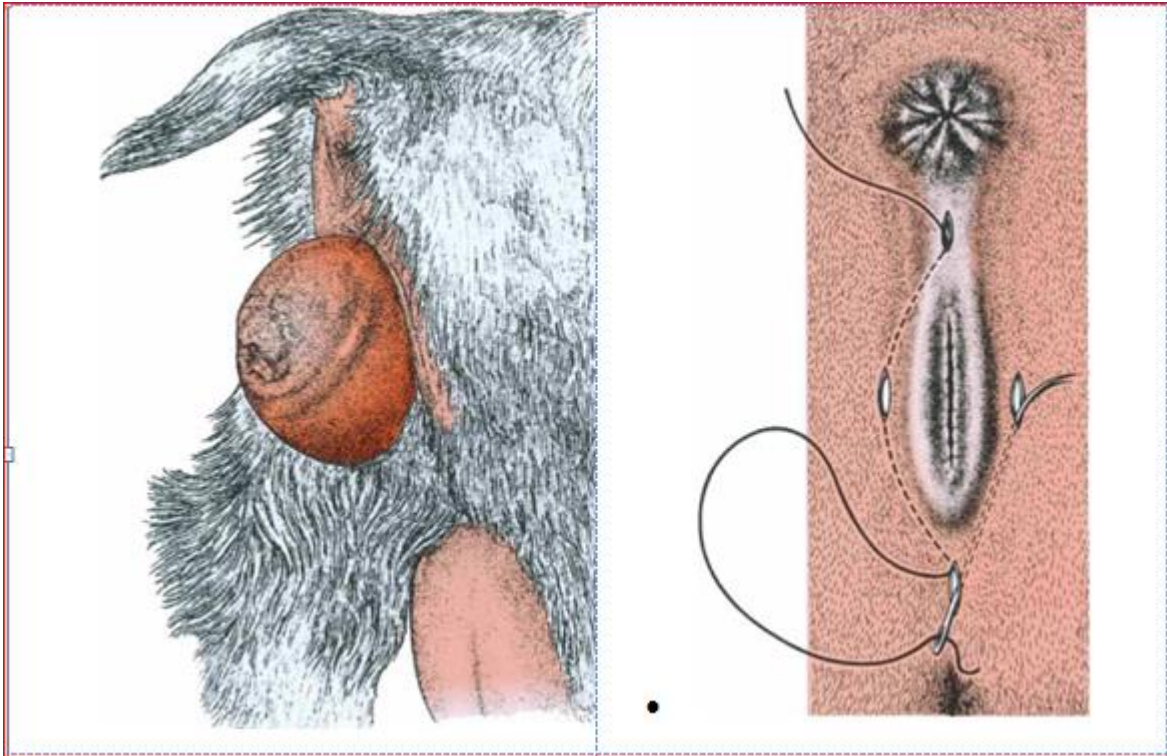


Figure-Hydrops allantois in the cow, showing gross abdominal distension.

Rupture of the uterus during pregnancy- need laparotomy and surgical correction

Herniation of pregnant uterus-abdominal hernia is common and need surgical correction

Prolepses of the vagina:-it is protrusion of vagina to outside and is an important and common condition requiring careful management. It is seen chiefly in cow, ewe, and sow; less commonly in mare, doe, bitch, and queen.



4.2 Vaginal bleeding

This may occur in all species and is of considerable concern to owners. The problem is seen most frequently in sows and bitches. In all species a vaginal discharge may indicate a pathological process in the vagina or uterus but it may also be present during a normal pregnancy. The obstetrician should always carry out a full investigation whenever possible to ensure that all is well with the pregnancy and to reassure the owner.

- A vaginal discharge may indicate a threatened or a progressing abortion. The discharge in such cases may be blood stained and may contain fresh or macerated fetal tissues together with placental remnants. The dam may show signs of general illness including pyrexia in cases where the abortion has been caused by infectious agents.
- A bloody discharge during pregnancy in the mare may arise from varicose veins in the vaginal wall. If blood loss is heavy the veins may be cauterized or ligated.



pyrexia. If the problem of vaginal discharge affects many sows in the herd bacterial cultures should be taken from a number of affected animals to identify the organism involved.

Early ultrasonographic pregnancy diagnosis will determine whether fetal life is affected, or indeed if it is present. A blood-stained vaginal discharge within a few days of service may be seen in some cases of pyelonephritis. Affected animals may show hematuria, pyuria and, if untreated, rapidly become toxemic.

- Some bitches produce small quantities of a clear mucoidal discharge throughout pregnancy; this is non-pathological. A foul discharge may indicate a complete or partial abortion and must be fully investigated (see above and also Chapter 9).
- A mucopurulent discharge in older pregnant bitches may occasionally be caused by local vaginal infection associated with crops of leiomyomata in the anterior vagina. Such infection is normally harmless but the pregnancy should be monitored ultrasonographically to ensure that fetal life is normal and the surrounding amniotic fluid is clear. Similar discharges may also be seen in cases of pyometra and the possibility of this
- developing about 3 weeks post service should be investigated. Ultrasonographic evaluation of the uterus will clearly distinguish whether the uterus contains pus as in pyometra or a normal pregnancy.
- A dark green vaginal discharge in pregnant bitches or a brown discharge in the queen cat may suggest fetal death and must be investigated urgently. In late pregnancy such a discharge often indicates fetal compromise following placental separation from the endometrium. Such animals must be submitted to a full obstetric examination as described in Chapter 9. Very occasionally only one puppy - that situated nearest to the cervix - has died and ultrasonographic scanning reveals that the rest are normal. Careful monitoring of such cases including regular checking of blood progesterone levels is mandatory.



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are birthing abnormalities (4 points)

2. What is the difference between hydrops amnion and hydrops allantois (4 points)

3. What is the difference between vaginal bleeding and abortion? (4points)

Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



4.1 Identifying birthing abnormalities

4.1.1 Taking case history

In cases of serious emergency, time may not permit the taking of a full case history but whenever possible this should be done. Much information can be quickly obtained even in emergency cases. The following points should be ascertained:

1. Is the birth premature or overdue? If there is any doubt, check the service dates personally.
2. Has the patient given birth before? Is this her first litter (i.e. primiparous) or has she had several previous litters (i.e. pluriparous)?
3. Were there any previous problems at birth? If so what were they, how were they resolved and what was the outcome?
4. What is known about the sire of the present litter? Was he used last time? Is there a large disparity in body size between sire and dam? Have any other animals pregnant to the same sire suffered dystocia recently?
5. Has the patient suffered any illness or accident during pregnancy? If so what were the details?
6. Has the animal been off color during the past few days?
7. Has the patient been straining and if so when did it start and how vigorous has the straining been?
8. Has there been any vaginal discharge and what was its nature?
9. Have any fetal membranes, fetal fluids, or fetal parts been seen at the vulva?
10. Has anyone already attempted to assist with the patient? The possibility of lay interference and resultant damage must always be borne in mind.



4.1.2 General Examination of the mother

This should be performed whenever possible. In an emergency the examination may initially have to be cursory but if there is any reason to believe the mother is unwell a full clinical examination must be carried out. Failure to perform this examination may have very serious consequences. In cattle, for example, acute life-threatening environmental mastitis may already be present and possibly contributing to the causes of a case of dystocia. Failure to diagnose and treat this problem may result in the death of the patient despite successful fetal delivery. The examination may influence the program of treatment.

The clinical examination should include the following:

General appearance and condition of the patient including:

- Is she bright and well or dull and dejected?
- Does she appear ready to give birth - are the normal preparatory signs of the species present?
- What is her bodily condition?
- Is she overweight, in good condition or emaciated?
- Is she able to stand and walk?
- Is she recumbent and immobile?
- Can any fetal parts be seen at the vulva?
- Are they exposed or covered by chorioallantois and amnion or only by amnion?
- Are the parts moist (possibly indicating recent exposure) or are they dry (possibly suggesting a protracted case)?
- What is the identity and condition of any visible fetal membranes?
- Is there any vaginal discharge?
- What is the degree of abdominal distension?
- Is there any evidence of fetal life?
- Can any exposed fetal parts be seen to be moving spontaneously or can unborn fetuses be seen or felt moving through the flanks of the mother?



4.1.3 Obstetric Examination.

The case history and the general clinical examination may influence the treatment of the case and its prognosis. Wherever possible, veterinary obstetricians should seek to deal with their patient in the most suitable environment for both parties. In many cases when the animal cannot be moved there may be no choice other than to deal with the animal where it is. If possible, obstetric cases should be examined, diagnosed and treated in a clean, warm and well-lit environment.

4.1.4 Restraint of the patient

The restraint and detailed description of the internal examination of each species will be dealt with in chapters devoted to the individual species. A number of general points may be dealt with here. Animals may be particularly aggressive and potentially very dangerous at parturition and obstetricians must ensure their own safety and that of the owners, attendants, and assistants while the patient is being examined and treated. The larger species are usually secured either by a halter or head collar or (in the case of cattle) in a crush or similar mechanical head restraint. Sows are currently normally restrained in farrowing crates but if loose the obstetrician should be protected by an attendant with a pig board standing by the sow's head. The other species are usually held manually by their owners or attendants. In all cases at least one but preferably two helpers are required but, especially on farms, assistance is often very limited.

In the case of violent or particularly aggressive animals possibly being handled or restrained for the first time, sedation may be required and for some manipulations in the mare general anesthesia may be advantageous.

4.1.6 Vaginal examination

Vaginal examination must be performed with gentleness, care, and with the strictest cleanliness. It is essential that veterinarians set a good example for others to follow in these matters. The perineum and adjacent areas should be washed with soap and water to which may be added a little disinfectant such as chlorhexidine. Obstetricians must ensure that their hands have been carefully washed, their fingernails are short, and rings removed. Proper protective clothing is required and in the larger farm species waterproof trousers



anda parturition overall are essential. A long overall is not suitable for use with the foaling mare. In the smaller species normal surgery clothing is suitable. Gloves may be worn (latex hand gloves for small animals and long plastic arm-length gloves for the farm species) but may in some cases reduce the sensitivity required for obstetric work. If the birth canal is believed to be infected or if there is a zoonotic risk, gloves are essential. Pregnant women should not work with sheep at lambing time. The two species share a number of common pathogens that can cause abortion.

Instrumentation should be available but the obstetrician's fingers, hands, and arms are the most important aids. Small fingers and long arms are very useful in veterinary obstetrics but not all colleagues are fortunate enough to have them. Details of specialist instrumentation will be discussed in subsequent chapters.

Before examining the birth canal and its contents the obstetrician's hands should be lubricated either by soap and water or preferably by using a proprietary obstetric lubricant. In the larger species the hand and parts of the arms may be inserted with relative ease into the dilated, parturient birth canal. In the dog the forefinger is mostly used but in the toy breeds and in cats it may only be possible to insert the lubricated little finger. In very small animals such as guinea pigs and mice digital vaginal examination is often not possible.

The aim of the vaginal examination is to explore the accessible parts of the birth canal to determine:

1. Whether the caudal parts of the canal are dilated and also the diameter of the cervix. (*Note: the cervix is not normally directly palpable in the dog or cat.*)
2. The state of natural lubrication or dryness of the birth canal and whether the birth canal has sustained any damage or is obstructed for any reason.
3. Whether any fetuses are present, their location within the birth canal and if possible their living state. (*Note: it may not be possible to be sure whether the fetuses are alive or dead at this stage and further tests such as ultrasonographic assessment may be required.*) The obstetrician must always be careful not to predict fetal viability or survival until the case is fully assessed.



4. Whether the presentation, position, and posture (see below for definitions) of such fetuses is normal and if abnormal to determine the exact nature of any palpable abnormality.
5. The presence of any fetal membranes and, if possible, whether their uterine connections are intact or detached.
6. The relative size of the soft tissue and bony components of the palpable parts of the birth canal, and the likelihood of fetuses being able to pass through it; the presence of any obvious bony damage such as a pelvic fracture or sacral displacement; the presence of any soft tissue damage and its likely effect upon birth.
7. The tonic state of the uterus if palpable (not normally directly palpable in small animals).
8. Whether dystocia is present; to diagnose its cause and enable a tentative plan of treatment to be formulated.
9. Whether vaginal delivery is likely to be possible.

4.2 Normal birth in Presentation, Position and posture of the fetus

These terms enable orientation of the fetus to be accurately described in cases of normal and abnormal birth. They are defined as follows:

Presentation: the relationship between the long axis of the fetus and the long axis of the maternal birth canal. Mostly longitudinal (anterior or posterior) but can occasionally be transverse or vertical.

Position: that surface of the maternal birth canal to which the fetal vertebral column is applied. Mostly dorsal but may be ventral (fetus 'upside down') or lateral (right or left).

Posture: the disposition of the head and limbs of the fetus.

Thus a calf during normal birth would be in anterior longitudinal presentation, dorsal position, and with a posture in which the extended head and neck were resting on the extended forelimbs. A puppy during normal birth would be in anterior longitudinal presentation and dorsal position. It has a posture in which

the head and neck are extended, the forelimbs, with shoulders flexed, are held by the side. The hindlimbs are extended behind. Examples of presentation, position and posture are shown in the following figures.

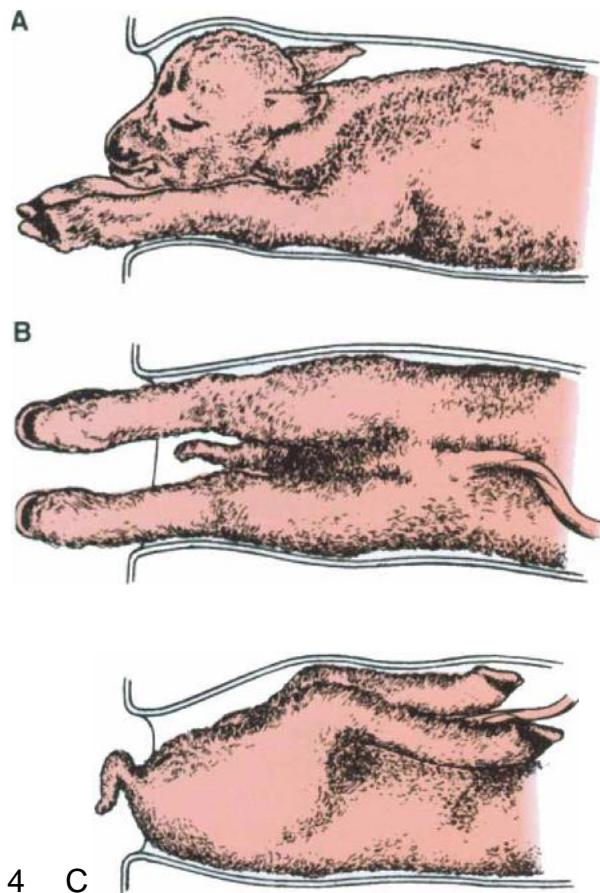


Fig. Examples of presentation, position and posture. (A) Lamb in anterior presentation, dorsal position, head resting on extended forelimbs. (B) Posterior presentation, left lateral position, hindlimbs extended. (C) Posterior presentation, ventral position, bilateral hip flexion (breech presentation).



4.2 Difficulty of giving birth (Dystocia)

The causes of dystocia are divided into maternal or fetal causes, depending on whether the mother or her offspring were 'responsible' for the problem. In many cases both maternal and fetal factors are involved and the classification of causes becomes less exact. Our greater knowledge of the endocrine control of the birth process has shown that although in many species the fetus initiates the process, a cascade of hormone changes follows in the mother.

The maternal components of birth are the provision of expulsive forces and a bony and soft tissue birth canal through which the fetus can pass.

The fetal components of birth include initiation of the birth process; the assumption of correct presentation, position, and posture; and being sufficiently small to pass through the birth canal.

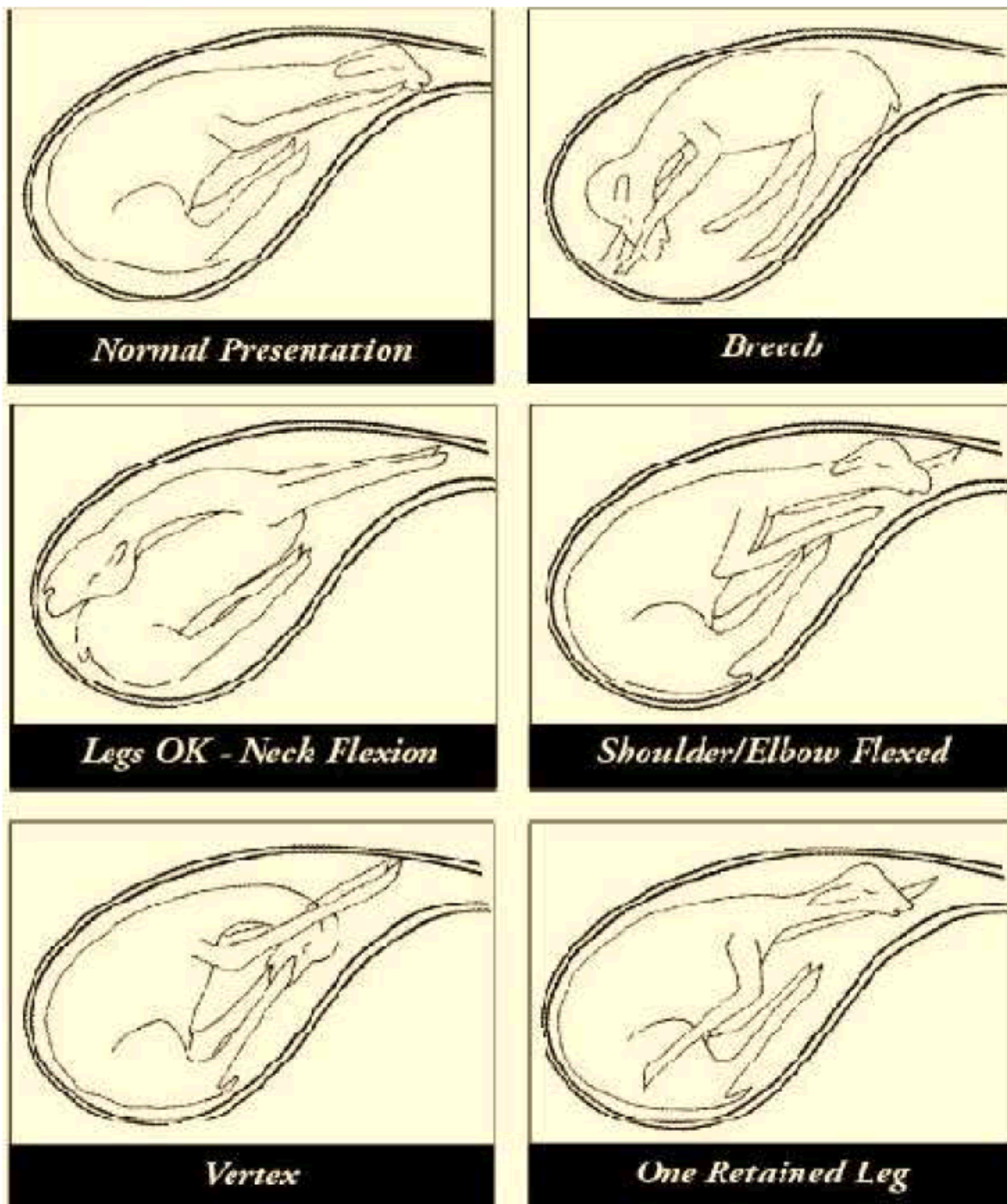
CAUSES OF DYSTOCIA

➤ Maternal causes

- *Failure of expulsive forces*
- *Uterine*
- Primary uterine inertia *Myometrial defects*: overstretching, degeneration (senility, toxic, etc.), uterine infection, systemic illness, small litter size, heredity
 - *Biochemical deficiencies*: estrogen/progesterone ratio, oxytocin, prostaglandin Fla, relaxin, calcium, glucose
 - *Hysteria/environmental disturbance*
 - *Oligoamnion*(deficiency of amniotic fluid)
 - *Premature birth*
- Secondary uterine inertia (the consequence of another cause of dystocia)
- Uterine damage including rupture
- Uterine torsion (may also cause obstruction of birth canal)
- *Abdominal*
- Inability to strain (because of age, pain, debility, diaphragmatic rupture, tracheal/laryngeal damage)
- *Obstruction of the birth canal*



- *Bony pelvis*: fracture, breed, diet, immaturity, neoplasia, disease
- Soft tissue:
- Vulva congenital defect, fibrosis, immaturity
- Vagina congenital defect, fibrosis, prolapse, neoplasia, perivaginal abscess, hymen Cervix congenital defect, fibrosis, failure to dilate
- Uterus torsion, deviation, herniation, adhesion, stenosis
 - **Fetal causes**
 - *Hormone deficiency* ACTH/cortisol: initiation of birth
 - *Fetopelvic disproportion* fetal oversize ± defect fetal monisters



Diagnosis and treatment plan

As a result of the general clinical examination, the detailed obstetric examination, and any useful back-ground information provided by the patient's history, the obstetrician will normally be able to arrive at a diagnosis of the cause of dystocia and formulate a plan for the resolution of the case. Such a plan should initially be tentative because, if the first attempt at treatment is unsuccessful, alternative treatments may have to be employed and must always be kept in mind.



The welfare of the patient must be paramount when planning and carrying out treatment. The wishes of the owner - sometimes quite forcibly expressed - must be carefully considered but the final course of action is decided by the obstetrician. In practice, economic considerations have to be taken into account to ensure that the cost of the proposed treatment can be met and is realistic.

Possible treatments are:

1. *Conservative treatment:* the obstetrician may consider the case to be not quite ready for assistance and decide to allow the patient a finite period of time before taking further action.
2. *Manipulative treatment:* assisted vaginal delivery after correction of any fetal maldisposition.
3. *Drug therapy to increase myometrial activity:* the use of specific ecbolic drugs such as oxytocin. Calcium or glucose therapy may be required in cases where a deficiency is suspected.
4. *Surgical treatment:* at cesarean section the uterus is opened surgically to allow removal of the offspring via laparotomy. On occasion the uterus may be found to be so damaged at surgery that hysterectomy is necessary.
5. Fetotomy (sometimes termed 'embryotomy') is the division - by the obstetrician working per vaginam - of the fetus into small portions that can more easily be delivered through the birth canal.
6. Regrettably, and fortunately very occasionally, the mother may be in such a poor state or its economic value is so low when presented for treatment that euthanasia is necessary.



➤ CESAREAN SECTION IN THE COW

➤ Indications

- *Resolution of existing dystocia*
- Fetopelvic disproportion including cases of misalliance and postmaturity.
- Fetal maldisposition, which cannot be corrected by manipulation.
- Irreducible uterine torsion.
- Incomplete dilation of cervix or other parts of birth canal.
- Fetal monsters that cannot be delivered by other means.
- Uterine rupture or severe uterine hemorrhage.
- Damaged and severe vaginal prolapse where further damage might accompany vaginal delivery.

- *Elective cesarean section*
- Surgical termination of prolonged gestation.
- To avoid existing or suspected fetopelvic disproportion.



Termination of pregnancy in cases of life-threatening disease in the dam: for example, some cases of hydrops allantois antraumatic reticuhtis or pericarditis. Induction of

birth might be used as an alternative in such cases but the time required for the drugs to work may not be compatible with maternal life.

➤ **Prognosis**

➤ *Resolution of existing dystocia*

➤ This should be discussed with the owner before surgery and depends on a number of factors. The prognosis for a successful outcome is proportional to the duration of existing dystocia. The bovine fetus may not survive more than 8 hours of second-stage labor. The mortality rate in the dam rises if surgery is not performed until more than 24 hours after the commencement of dystocia or if the fetus is dead and emphysematous. Prolonged attempts at delivery by traction will also reduce the chances of fetal and maternal survival. The availability of skilled assistance and the ability to maintain reasonable asepsis during surgery are also important factors. A maternal survival rate of 80-90% should be expected. Fetal survival should be good in cases of elective cesarean section but decreases with increasing duration of second-stage labor.

➤ In some cases, fetotomy may be an alternative to cesarean section (see discussion in Chapter 12). Occasionally, if the fetus is dead and the cow is already suffering from toxemia, humane slaughter may be advisable.

➤ *Elective cesarean section*

➤ An elective cesarean section is more easily and safely performed in first-stage labor than during late pregnancy. The risks of an inadequate milk supply or retention of the placenta are smaller at this stage. Ideally, elective cesarean section should be performed when the cow's cervix is fully dilated. At this stage the calf has been subjected to some of the beneficial stresses of labor. As a result of the release of catecholamines that occurs in labor, the calf is better prepared for postnatal respiratory and metabolic adaptation.



The release of adrenaline (epinephrine) by the mildly stressed calf produces more effective removal of lung fluids and better release of surfactant. Better gas exchange is promoted and better energy release helps to maintain body temperature in the neonate.

The location chosen for surgery

➤ There is often little choice on farms, but a clean, well-lit location should be selected. A major sweeping and cleaning up of the location likely to stir up clouds of dust immediately prior to surgery is inadvisable.

➤ Examination of the cow prior to surgery

➤ The obstetrician will normally already have a good knowledge of the condition of both dam and fetus as a result of the examinations made before and during attempts at vaginal delivery. Further examination should determine, if possible, in which uterine horn the fetus is located, because this may influence the laparotomy site selected. The ability of the dam to remain standing if necessary during surgery, and her current state of well-being - including the need for fluid and other supportive therapy before or during surgery - should also be assessed. If the fetus is hyper-active or its residual amniotic fluid is stained green with meconium it may be becoming hypoxic. Surgery should be commenced with all possible speed to ensure delivery of a living calf.

➤ Assistance required

➤ If the operation is to be carried out on the standing cow, one attendant will be required to restrain the patient, but if a recumbent position is chosen at least two experienced assistants are necessary. Although cesarean section can be carried out single handed, skilled surgical assistance in the form of a colleague or veterinary nurse makes the procedure both simpler and safer. An additional assistant to help with removal of the calf and its care after delivery is advisable. If an emergency arises with either the cow or calf during surgery, the presence of skilled help will make resolution of the problem and maintenance of asepsis much easier.

➤ Preparations for surgery

➤ The obstetrician should ensure that everything necessary for surgery is to hand, make sure the patient is well prepared and that facilities are as good as



possible. The obstetrician should also ensure that assistants - skilled or otherwise - are briefed on what to do in emergencies either involving the cow or calf. Once the operation



underway there should be no unnecessary delay - the longer the peritoneal cavity remains open on the farm, the greater the risk of infection.

-
- Equipment should include:
 - Appropriate drugs for sedation, local anesthesia, and analgesia.
 - Electric clippers for removing hair from the surgical site.
 - A portable halogen light if local illumination is poor.
 - Resuscitation facilities, including arrangements to dry and warm the calf. Doxapram hydrochloride (50 mg) can be placed in a syringe with suitable needle prior to surgery in case it is needed urgently when the calf is delivered.
 - Sterilized calving ropes or chains, which may be needed during removal of the calf.
 - Solutions for skin preparation: severe contamination should be removed using soap and water. Skin disinfection prior to surgery can be achieved the aid of a surgical scrub solution of chlorhexidene, povidone-iodine, or 4% chlorhexidene gluconate followed by application of surgical spirit. Application of 10% povidone-iodine alcoholic tincture to the skin will enable a one-stage disinfection to be performed.
 - Sterile drape, e.g. disposable paper type: useful to maintain asepsis but may frighten a nervous standing heifer.
 - Surgical kit: scalpel, rat-toothed forceps, scissors, six hemostats, heavy-duty needle holders, suture scissors, selection of round bodied and cutting suture needles. A Robert's embryotomy knife should be included in case it is necessary to open the uterus deep in the abdomen.
 - Suture material: an absorbable suture for closure of peritoneum, muscles, and subcutis. Monofilament or braided nylon for the skin.
 - Antibiotics: antibiotic cover is given prophylactically, penicillin/streptomycin combination or ampicillin being useful. Treatment is preferably



commenced prior to surgery. If infection of the peritoneum is likely, a water-soluble form of these drugs may be instilled into the peritoneal cavity before wound closure.

- advantages and disadvantages of the various sites are summarized as follows.
- **Flank laparotomy**
- **Advantages** Only local anesthesia is required, the incision may be easily extended if necessary, the risk of postoperative soiling of the wound or herniation is small.
- **Disadvantages** The uterus is often difficult to exteriorize prior to opening, the peritoneum is readily contaminated with uterine contents especially if the calf is dead and emphysematous.
- In left-flank laparotomy the rumen may occasionally make access to the uterus difficult but the risk of the small intestine falling out of the wound is normally small.
- Right-flank laparotomy allows good access to a calf in the right uterine horn but the risk of loops of small intestine tending to slip out of the laparotomy incision is higher.
- Flank laparotomy can be performed on the standing or laterally recumbent cow. Surgery on the standing patient is preferred by most obstetricians if the patient is likely to remain standing and not go down suddenly during surgery. Opening and closure of the peritoneal cavity is often a more straightforward procedure in the standing patient. There is less intra-abdominal pressure but exteriorization of the uterus can be difficult in some cases. If the cow is thought likely to go down during surgery it is probably better to sedate, cast, and restrain her in sternal or lateral recumbency with the upper hindleg pulled back.
- **Ventrolateral or midline laparotomy**
- **Advantages** The uterus (even one containing an emphysematous calf) can more readily be exteriorized with less risk of peritoneal contamination. **Disadvantages** Heavy sedation or general anesthesia is required, the risk of postoperative soiling of the incision or



herniation is higher.





Position of the cow and selection of operation site

- In most cases, a left-flank laparotomy is performed on the standing cow. Alternative sites include a right-flank, a ventrolateral, or a midline laparotomy. The

Left-flank cesarean section in the standing cow

- *Restraint*
- The head should be secured with a halter, which should be fixed to a wall or other solid point but will



- permit the cow to lie down if she wishes. A length of rope should be attached to the patient's right hindleg so that it can be pulled forward - should

the animal decide to lie down during the operation - thus ensuring continued access to the left flank.

- *Sedation*

- This may not be required in a quiet cow but is useful in nervous or aggressive animals. Xylazine is very useful. Dose: 2.5 mg/50 kg body weight by intramuscular injection or 0.05 mg/kg by intravenous injection - the latter is not a licensed route of administration for cattle in some countries. Xylazine may increase the tone of the uterine musculature, making exteriorization of the uterus more difficult during surgery.

- *Myometrial relaxation*

- Clenbuterol (300 µg) given by intramuscular or slow intravenous injection just prior to surgery will help to counteract the myometrial action of xylazine and may facilitate manipulation of the uterus during surgery.

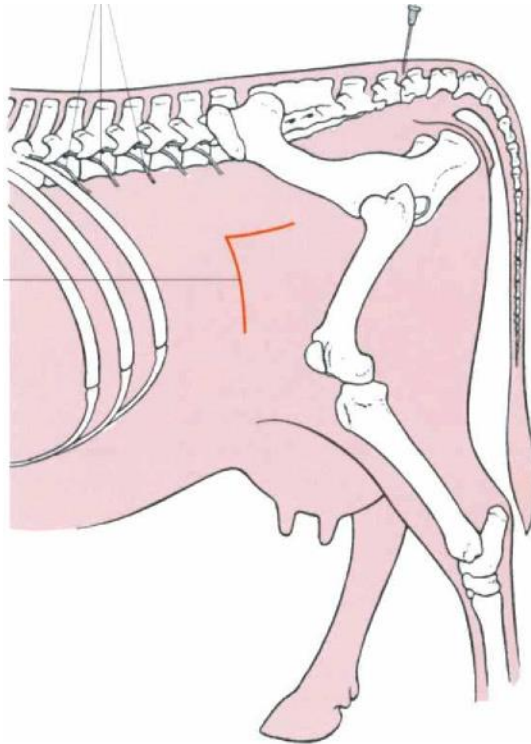


- splitting ('grid iron') approach to the abdomen is used. Approximately 80-100 mL of local anesthetic is needed for local infiltration. Paravertebral anesthesia is achieved by blocking the outflow from spinal nerves T13-L3. The nerves are found just behind the last rib and the first three lumbar vertebrae respectively; 20 mL local anesthetic is injected over each nerve. Figure 11.1 illustrates the sites of local infiltration, epidural, and paravertebral anesthesia. For further detailed discussion of anesthetic techniques, see Hall, Clarke & Trim (2003).
- **Surgical technique**
- *Entry into the peritoneal cavity*
- **Skin incision** A vertical incision is made through the skin 25-30 cm in length commencing approximately 10 cm below the transverse processes of the lumbar vertebrae and halfway between the last rib and the tuber coxae. In fat animals, layers of adipose tissue
- *Preparation of the surgical site*
- Hair is clipped from an area of the left flank extending laterally from the last rib to the tuber coxae and dorsoventrally from the spines of the vertebrae down to the lowest part of the flank. If the patient is soiled the clipped site should be initially washed and scrubbed using liquid soap and water. The skin is then thoroughly scrubbed with a surgical scrub solution. Finally, surgical spirit is applied. (Alternatively, a 10% povidone iodine alcoholic tincture can be used for one-stage disinfection.)
 - If local infiltration anesthesia is used the site should be prepared before the anesthetic is instilled, with a final preparation immediately prior to surgery.
 - *Anesthesia*
 - Epidural anesthesia is not essential but useful to prevent straining and tail movements during surgery; 5-8 mL 2% lidocaine (lignocaine) hydrochloride without adrenaline (epinephrine) is given epidurally into the first or second intercoccygeal space. A larger dose may cause the patient to become recumbent and is contraindicated.



- Local anesthesia maybe local infiltration, an invertedL block, or by paravertebral injection. Local infiltrationanesthesia has the advantage of speed. It may occasionally interfere with wound healing and may be lesseffective than either of the other techniques if a muscle





-
- **Figure 11.1** Bovine cesarean section - sites for anesthesia. (A) Epidural, (B) local infiltration, (C) paravertebral (see text for details).

➤ FETOTOMY

➤ 'Fetotomy' (often termed 'embryotomy') is the term used to describe methods of dividing a fetus, which cannot be delivered, into small pieces that will more readily pass through the birth canal. The technique should be used only when the fetus is known to be dead. Fetotomy is used most commonly in cattle, occasionally in horses, rarely in sheep and goats, and almost never in pigs and small animals. Fetotomy can be complete, when a whole fetus is divided into smaller pieces, or partial, when a small part of the fetus, such as a leg, is removed.

➤ Two techniques of fetotomy are available - percutaneous and subcutaneous:

➤ In *percutaneous fetotomy* a tubular embryotome is used, through which a flexible wire saw is passed. The wire saw is used to cut through the fetus while the embryotome protects the maternal tissues from damage.

➤ In *subcutaneous fetotomy* parts of the fetus are dissected out from within its skin, thus reducing fetal bulk (and allowing delivery of the remainder through the birth canal).

➤ Percutaneous fetotomy is the preferred method unless the fetus is in a very



decomposed state and can readily be broken up by hand.

➤ INDICATIONS

- The relief of dystocia caused by fetal maldisposition that cannot be corrected by manipulative means.
- The relief of dystocia caused by fetopelvic disproportion in which the fetus is dead and cannot be removed by traction. The fetus may be normal but oversized or it may be abnormal as a fetal monster.
- The relief of dystocia caused by the fetus becoming stuck during delivery - for example in the cow when
 - stifle lock (sometimes termed 'hip lock') occurs after the head and part of the fetal thorax have been delivered.
 - During cesarean section when the dead fetus is either too large to remove from the uterus in the normal way, is deformed, or is in a disposition that cannot be corrected.

THE FETOTOMY/CESAREAN SECTION DEBATE

- The obstetrician must decide which of these two techniques to use:
 1. Fetotomy should be considered only when the fetus is known to be dead.
- Cesarean section *must* be used when the fetus is known or believed to be alive.
- The extent of the fetotomy likely to be required is another very important factor, as is the accessibility of the fetus to the obstetrician. If a moderately sized dead fetus has a lateral deviation of the head that cannot be corrected manually and the birth canal is sufficiently dilated for the obstetrician to gain easy access to the base of the fetal neck, then fetotomy is indicated. The fetal neck is sectioned to allow delivery of the deviated head followed by the remainder of the fetus. If the fetus is in the same maldisposition but the cervix is only partially dilated - making access to the fetus extremely difficult - fetotomy may be impossible. In such circumstances cesarean section, even though the fetus is dead, may be the best or even the only solution.
- Other considerations include the experience of the obstetrician and the



availability of equipment. A complete fetotomy in a restricted space can be an extremely demanding and time-consuming procedure for even the experienced obstetrician. The longer and



- more complicated the fetotomy, the greater the risk of maternal damage and infection. It has been suggested that, ideally, a fetotomy should involve no more than six cuts with the embryotome and should not take more than an hour to complete. If it is thought that these limits cannot be observed then cesarean section may provide the best course of action.
- The inexperienced obstetrician may feel happier to embark on the more familiar technique of cesarean section, although the prognosis of this technique is poorer when the fetus is dead. If the obstetrician is unsure of his or her competence to embark on either technique, further professional assistance should be sought. A partial fetotomy is normally quite a simple procedure and having successfully completed a number of such cases the obstetrician may feel happier to take on more complicated cases.
- A good tubular embryotome with all its accessories is essential for successful fetotomy. Although in an emergency fetotomy can be performed without an embryotome, the risk of damage to the mother is much greater.
- In some circumstances there may be no alternative to fetotomy. An example of this - which is probably the most common indication for bovine fetotomy - is when the obstetrician must deliver a bovine fetus stuck in stifle lock. In most cases the calving has been unattended and the dead fetus is found with its head and part of the thorax protruding from the cow's vagina (see Fig. 4.22). It cannot be delivered by traction and it



➤ cannot be repelled into the uterus so that cesarean section could be performed. Fetotomy provides the only answer and, in most examples of this problem, can be completed without difficulty even by the inexperienced but well-equipped obstetrician.

➤ In all cases the condition of the mother is of paramount importance. In both fetotomy and cesarean section the prognosis of a successful outcome is closely related to the duration of the dystocia. The longer an animal suffers from dystocia before treatment is commenced, the poorer the prognosis.

➤ A number of surveys have compared the success of fetotomy and cesarean section, with somewhat conflicting results in terms both of recovery from the procedure and future fertility. The best results are likely to be achieved by a skilled obstetrician who has made an early decision to proceed with either technique in a healthy patient in a clean environment.

5 Still birth (3)

6 Prolapse (uterine or vaginal) (3)

Retained fetal membrane) (3)

7 Bleeding (3)

8 Abortion (3)

9 Extended gestation period (3)

10 Dystocia (3)



**Note: Satisfactory rating –11 points
points**

Unsatisfactory – 11 below 6

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



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

- Monitoring post-birthing health and bonding of dam and newborn and reporting any abnormality to the supervisor
- Providing clean and comfortable area for lactating animals as directed by the supervisor.
- Providing appropriate and sufficient food and clean water for lactating animal
- Carrying out milking in a clean manner following the organizational procedure to minimize contamination and reduce incidence of mastitis.
- Observing the condition and health status of lactating animals and recording and reporting any abnormalities to the supervisor

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 –**

- Post-birthing health and bonding of dam and newborn are monitored and any abnormality reported to the supervisor
- Clean and comfortable area is provided for lactating animals as directed by the supervisor.
- Appropriate and sufficient food and clean water are provided for lactating animal as instructed
- Milking is carried out in a clean manner following the organizational procedure to minimize contamination and reduce incidence of mastitis.
- The condition and health status of lactating animals are observed and any abnormalities are recorded and reported to the supervisor

Learning Instructions:

20. Read the specific objectives of this Learning Guide.

21. Follow the instructions described in number 3 to 20.



22. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask your teacher for assistance if you have hard time understanding them.
23. Accomplish the “Self-check 1” in page -.
24. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
25. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
26. Submit your accomplished Self-check. This will form part of your training portfolio.

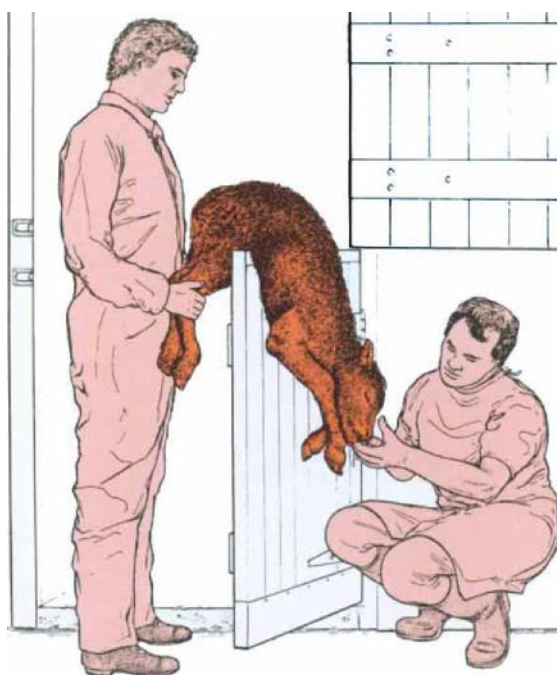
Information Sheet-1	Monitoring post-birthing health and bonding of dam and newborn and reporting any abnormality to the supervisor
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1.1 Monitoring post-birthing health

1.1.2 Bonding of dam and newborn a

1. Resuscitation of calf done by:-

1. *Clearing the airway:* to remove fluid remained in the lungs and mucus that might have been inhaled during birth by encouraging to drain out in the early post parturient phase. The calf can be held up by its back legs and swung backwards and forwards, although this may be difficult with a heavy calf. Alternatively, the calf may be briefly suspended by its legs from a convenient beam or hung over a door







2. *Fetal heart beat*: If there are no vital signs, an attempt to establish a heart beat is unlikely to be successful. However, external cardiac massage or an intracardiac injection of adrenaline (epinephrine) may be tried.

3. *Establishment of respiration when the heart is beating*: The calf should normally take its first breath within 30 seconds of delivery. In the healthy calf, further gasping movements are made before shallow respiratory movements are made. *Oxygen therapy* can be supplied by face mask or endotracheal tube. *Inflation of the fetal lungs using an esophageal tube*: in the absence of an endotracheal tube, or if attempts to intubate the calf fail, this technique can be tried. Two people are required to use the technique effectively. A small (foal size) stomach tube is passed into the calf's esophagus. Applying positive pressure through this will dilate the calf's abomasum but not inflate its lungs. The esophagus is obstructed distal to the end of the tube by compressing it between the finger and thumb. The calf's mouth is held tightly closed and its nostrils are covered.

4. *Artificial respiration*: If spontaneous breathing still fails to occur an attempt may be made, if equipment is available, to intubate the calf and provide positive-pressure ventilation. Mouth-to-mouth respiration should be avoided - it is ineffective and carries zoonotic risks.

4. *Breathing difficulties*: hyperpnea or dyspnea may indicate dysmaturity of the fetal lungs or possibly 8. a severe, life-threatening cardiac anomaly.

Signs of fetal acidosis: signs of immediate postpartum acidosis in the calf include:

- i superficial mainly abdominal breathing
- ii low fetal heart rate
- iii prolonged jugular filling time
- iv poor body muscle tone

After delivery of the calf the uterus must always be checked for evidence of another fetus. This process is repeated after each calf until the obstetrician is sure that the uterus is empty. The birth canal is checked for signs of damage and hemorrhage. Uterine involution usually commences immediately after the birth of the calf. If uterine tone feels low (the uterine walls are flabby) 20IU of oxytocin should be given by intramuscular injection. The udder is checked again for signs of mastitis.

2.1.2 Further care of the Cow and Calf

It is important that effective bonding between the calf and its mother develops. This is more likely to happen if the cow and calf are left quietly alone but care must be taken to ensure that the calf is not damaged if the cow or heifer is aggressive towards it.

The calf should be encouraged to suck colostrum within 6 hours of birth. The navel should be dipped in iodine or sprayed with antibiotic aerosol as soon after birth as possible. The navel should be checked at intervals after delivery to ensure that delayed hemorrhage from the umbilical vessels is not occurring. There should be negligible blood loss from the navel of the normal calf. Vessels



from which blood loss is occurring should be ligated. In neglected cases where severe blood loss has occurred, a blood transfusion may be required. The cow should be monitored carefully after calving for evidence of any of the post parturient problems that are discussed in next module.

2.2 Monitoring post-birthing health abnormalities.



2.2.1 Retention of fetal membrane

The fetal membranes are normally expelled during the third stage of labor. The membranes are said to be retained whenever the third stage of labor is prolonged beyond its normal duration. Retention of the membranes occurs in all species. It is particularly common in the dairy cow but the consequences of retention may be most serious in the mare. In the polytocus species such as the sow, bitch, and queen retention of the membranes may be associated with retention of one or more fetuses.

The causes of membrane retention are complex. Three main factors are involved:

1. Insufficient expulsive efforts by the myometrium.
2. Failure of the placenta to separate from the endometrium. This may be caused by inflammatory changes, placental immaturity, hormone imbalances, a neutropenia, a lack of polymorph migration to the sites of attachment, and possibly immune deficiencies.
3. Mechanical obstruction - including partial closure of the cervix.

Clinical signs The membranes are normally visible hanging from the vulva. They become progressively more decomposed, have a fetid odor, and are often contaminated with bedding and feces. Occasionally the membranes are not visible - possibly more frequently after twin calving - and are detected incidentally during a vaginal examination.

The cow usually appears unaffected by fetal membrane retention, although appetite and milk yield may be marginally reduced. If severe uterine infection is superimposed the cow may become dangerously ill.

Subsequent fertility The incidence of endometritis is higher and return to estrus after calving may be delayed after retention of the fetal membranes. Permanent damage is unlikely and once the cow starts to cycle, fertility should be unaffected.

Treatment There is some controversy between those who support and those who oppose manual removal. If left untreated, the membranes will eventually separate and be passed by the cow. The odor of the membranes may lead to milk taint and their appearance in a hygienic milking parlor is unpleasant. Physical removal may lead to some minor uterine damage at the point of caruncular attachment but this is unlikely to affect future breeding. On balance, if the membranes are retained it is advisable to try to remove them.

1.2.1 Manual removal of the retained fetal membranes

This is first attempted 72 hours after calving. The obstetrician should set a time limit for removal - if the membranes cannot be removed within 10 minutes they should be left for a further 48 hours before a further attempt at removal



is made. Strict attention to hygiene is important. A parturition overall and plastic arm-length sleeves should be worn on both arms. Despite the sleeves, the odor of the membranes may gain access to the hands. Two sleeves may be worn on each arm but the sensitivity of the fingers will be reduced. The perineal area of the cow is washed with mild disinfectant. During the procedure the cow frequently strains and passes feces. Any contamination must be removed and the area washed again before proceeding.

The obstetrician grasps any protruding strands of placenta in one hand and twists them into a 'rope' so that the placenta can be more easily managed. The other lubricated hand is introduced into the uterus. Occasionally at this stage it is found that the membranes are not actually attached at all but are perhaps just trapped by a single cotyledon, which is too large to pass the partially closed cervix. In this case the offending cotyledon is eased through the cervix and the remainder of the placenta is removed by gentle traction.

If the placenta is found to be attached, the hand inside the uterus but outside the placenta searches for the nearest attached caruncle and cotyledon. The chorioallantois is squeezed off the caruncle producing a sensation very similar to that felt when two pieces of Velcro are separated. The obstetrician moves methodically from one cotyledon to the next releasing every one that is still attached to its caruncle. It may be difficult to reach those deep in the fundus of the uterus. Gentle traction on the placenta will normally move these into a position in which they can be reached and separated. Once all the attachments have been released the placenta is gently removed by traction.

If the placenta has not been separated within 10 minutes the attempt should cease - to avoid damage. The case is seen again in 48 hours, when a further attempt at removal is made. If the second attempt is still unsuccessful another is made 48-72 hours later.

After removal of the placenta, antibiotic pessaries may be inserted into the uterus, but it must be remembered that these may have milk withdrawal restrictions. If there is much unpleasant debris in the uterus it may be lavaged with warm saline and the contents siphoned out with a stomach tube. If there is evidence of active infection a parenteral course of antibiotic therapy is prescribed and appropriate milk withdrawal advised. Occasionally the obstetrician may be unable to get through the partially closed cervix to release the attached cotyledons. In such cases the placenta is left to separate naturally.



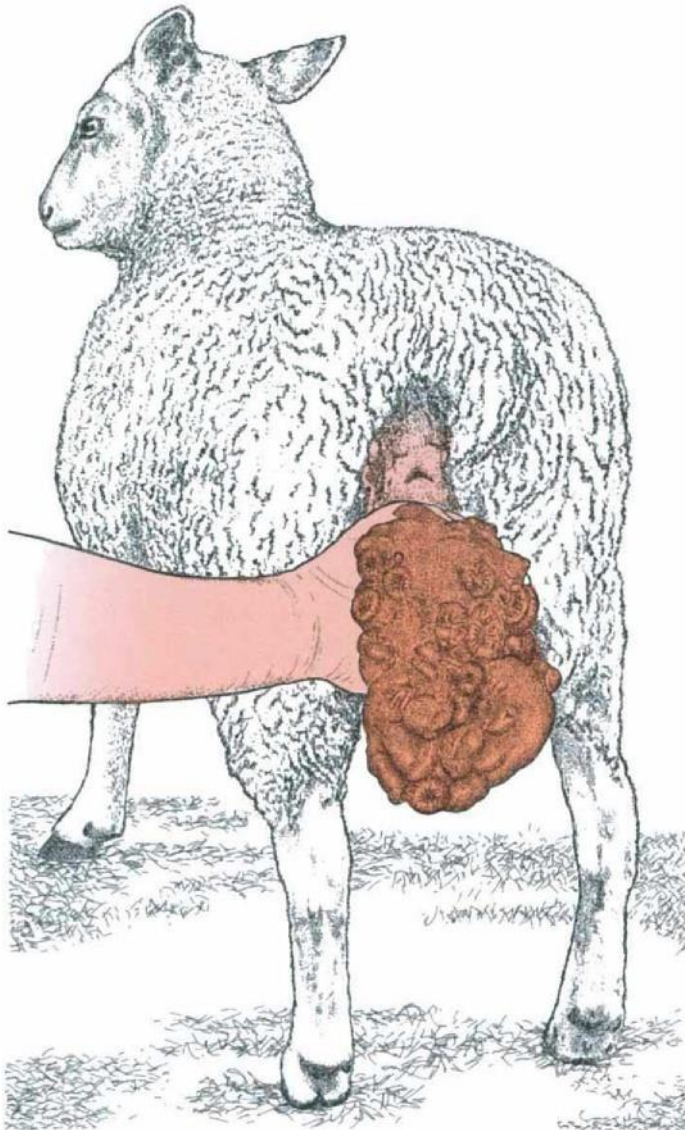


In mares, if the membranes have not been passed within 12 hours of birth

An attempt should be made to remove the membranes manually. If they are still tightly attached they should be left for a further 6-12 hours. A further injection of oxytocin is given and antibiotic cover continued.

2.1.2 Prolapse of Vagina

Incidence Occurs in all species but is more common in the ewe and sow, and less common in the cow and rare in the mare. In sows, vaginal prolapse may be accompanied by rectal prolapse.



2.13 Prolapse of uterus

Incidence Occurs in all the large animal species. It is most common in the cow and ewe, less common in the sow and doe goat, and rare in the mare. Normally the uterus prolapses only after fetal delivery but occasionally in the sow one uterine horn may prolapse while the other - still containing a number of fetuses - remains within the abdomen. In cattle the condition seems to be more common in



fat animals with excessive slackening of the pelvic ligaments and perineal tissues. 'Outbreaks' occur on some farms during one calving season and may be associated with diet, possibly with a high estrogen content.

Etiology Many factors may be involved in the etiology, including:

- Poor uterine tone: uterine inertia - in cattle hypocalcemia (a cause of primary uterine inertia) may predispose. Lack of tone may allow the uterus to fold in and permit part of the wall to move towards the pelvic inlet. Straining then pushes the flaccid organ through the vagina.
- Increased straining, which may be caused by pain or discomfort after parturition.
- Other causes of increased intra-abdominal pressure, including tympany and recumbency.
- Excessive traction at assisted parturition and the weight of retained fetal membranes have been suggested as other predisposing factors.

Clinical signs The patient is usually found with her uterus already prolapsed. One or both uterine horns may



be visible. The mucosal surface of the uterus - with its cotyledons - is visible and part of the chorioallantois may still be attached. The cow may be standing and apparently unconcerned or she may be shocked and recumbent. The uterus may be grossly contaminated with bedding and feces. It may also be lacerated, engorged, and edematous. If recently prolapsed it is warm to the touch but later becomes cold and discolored. Occasionally the cow is found dead. Death is often due to hemorrhage from the ovarian arteries, which may rupture as a result of the excessive tension placed on them by the prolapse.

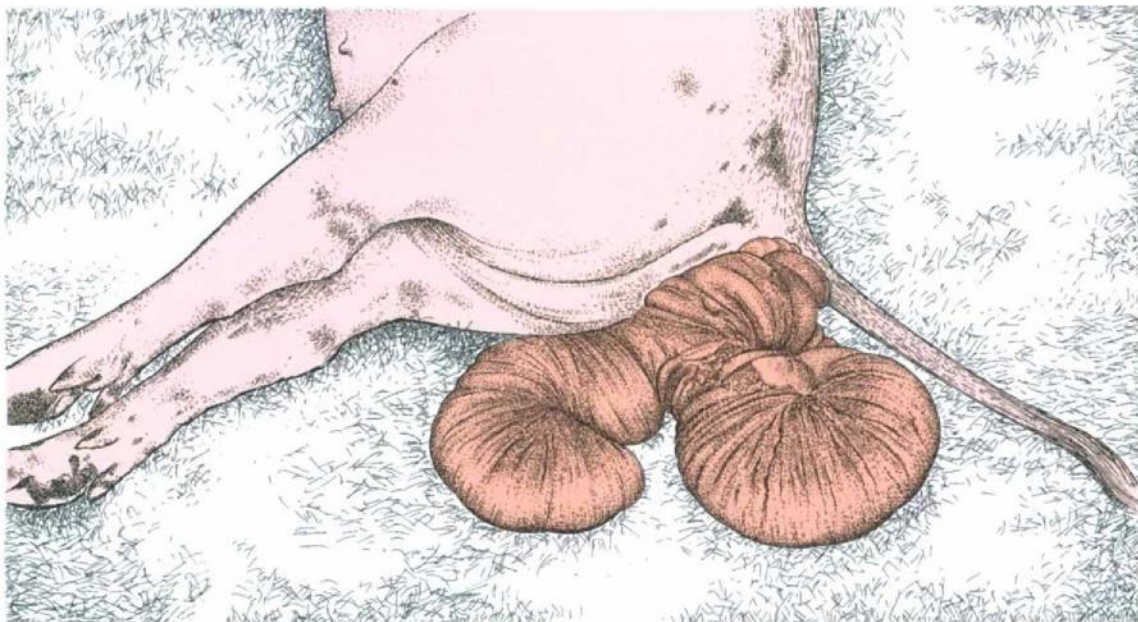
Prognosis This depends on: (1) the duration of the problem; (2) the degree of damage and contamination sustained by the uterus; (3) the degree of shock in the cow; (4) the position and accessibility of the patient.

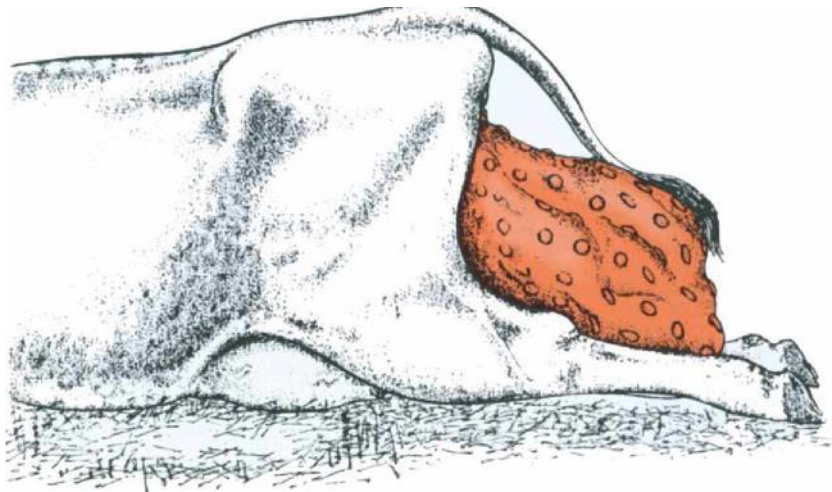
Treatment On receiving a call, the obstetrician should give advice on first aid care. The uterus should be protected from further damage, wrapped in a clean moist sheet, and, if possible, held above the level of the vulva.

On arrival the following treatment sequence should be followed:

1. Assess the cow's general condition: if she is moribund and severely shocked treatment may not be practical or economical. If there is evidence of hypocalcemia this should be treated.

2. Assess the cow's position: she may be in a most unsuitable position for treatment but it may also be impossible to move her. If her hindquarters are pointing downhill it would be advisable to move her so that her head is lower than her hindquarters. Gravity would thus help rather than hinder replacement.
3. Administer an epidural anesthetic.
4. Position the cow: this is best done by the 'New Zealand method'. The cow is placed in sternal recumbency with her hindlegs pulled out behind her. Two or three assistants are required for this. If the cow is standing she must be cast on her side and the uppermost hindlimb pulled out behind her. She is then rolled on to her other side so that the second hindlimb can be secured and extended caudally. An assistant sits astride her facing backwards and lifting the cow's tail out of the way (Fig. 13.3). See below * for an alternative method if sufficient help is not available.
5. Remove gross debris from the prolapsed organ by washing with saline or a very mild antiseptic.
6. Remove the placenta or its remnants from the cotyledons - if it separates easily. If not, leave it attached.





Cow - uterine prolapse, patient positioned for replacement.

*On occasion there may be insufficient assistance on the farm to place the cow in position with her hindlegs extended. In such circumstances the obstetrician must use an alternative method of replacement. The cow is given an epidural anesthetic and the uterus is prepared for replacement as in the New Zealand method. The obstetrician, wearing a parturition overall, kneels behind the cow and takes the prolapsed organ on his or her lap. The body of the uterus is first pushed back into the vagina while an assistant, if available, helps by holding the uterine horns above the level of the vulva. Pressure is now directed onto the horns, which are pushed back into their correct position. Replacement is greatly helped if the cow's hindquarters are higher than her forequarters. If raising her hindquarters or lowering her front end is possible this should be done, but only if there is no risk to the prolapsed organ. Post procedure treatment and care is as before

2.1.4 Post parturient recumbence

This important problem can arise in all species but especially in the large farm animals. The condition may be:

- a continuation of preparturientrecumbency
- recumbency arising from damage sustained during birth
- apostparturientrecumbency.

All cases of postparturientrecumbency must be examined with great care. The causes of the abnormality may be obstetric, medical (and rarely unrelated to parturition), or surgical. Every case must be examined methodically and thoroughly to ensure that no abnormality is overlooked. The importance of this detailed examination cannot be overemphasized. The entire animal must be inspected and examined. This can be physically difficult with a heavy recumbent cow or horse but nonetheless must be done. A fractured limb could be



overlooked in a recumbent animal unless each limb is examined in as much detail as possible. The main causes of postparturient recumbency in the various species are listed below. Their important clinical features and an outline of their management is summarized below. For further information the reader is advised to consult appropriate books on medicine and surgery.

Although the condition occurs in all species, it is more common in the cow than in the other species. Diagnosis, prognosis, management, and treatment may be particularly difficult in this species. For this reason, post-parturient recumbency will be covered in detail in the cow with comparative details in the other species.

The cow

Postparturient recumbency is a major problem in cattle. It may be acute and rapidly responsive to appropriate therapy or more chronic, less responsive and may progress to the downer cow syndrome.

Mineral deficiencies/metabolic problems

Calcium deficiency This is an important cause of recumbency in the periparturient cow. The highest incidence is in dairy cows beyond their second lactation in the first 48 hours after calving. The condition (commonly known as 'milk fever') can also occur

before birth, during birth as a cause of primary uterine inertia, or occasionally later in lactation. Mildly affected cases may appear slightly ataxic and have some difficulty in rising. In severe cases the animal is recumbent, has a low body temperature, dilated pupils with poor light response, reduced rumenal activity, and may lie with its head turned round against its flank. If untreated the condition progresses to coma and death. **Treatment** Four hundred mL calcium borogluconate with added magnesium, phosphorus, and dextrose (CaMgPD) is given by slow intravenous injection with 400 mL 40% calcium borogluconate given subcutaneously. Before treatment it is wise to take and keep a blood sample in heparin to enable plasma assays of Ca^{++} , Mg^{2+} , and PO_4^{2-} to be estimated if the case does not respond to treatment. A plasma calcium concentration of <1.5 mmol/L is indicative of a deficiency.

Magnesium deficiency On some farms, periparturient calcium deficiency is accompanied by a magnesium deficiency - plasma levels of <0.8 mmol/L confirming the problem. Low dietary magnesium intake may also depress calcium intake. Cows affected with the double deficiency may be slightly hyperesthetic and in particular show an exaggerated palpebral reflex.

Treatment CaMgPD solution given intravenously will usually be beneficial to affected animals. If a serious magnesium deficiency is present, 400 mL of 25% magnesium sulfate injection should be given by sub-cutaneous injection. A blood sample should be taken before treatment for later evaluation of plasma levels of calcium, magnesium, and phosphorus if there is any doubt about the deficiencies involved. The results of sampling may be confusing if the farmer



has already instituted treatment. Severe, sudden, and acute magnesium deficiency in the form of 'staggers' ('grass staggers') seldom occurs at calving time. It may do so, however, in especially harsh weather conditions. Affected animals are severely hyperesthetic and frequently collapse in lateral recumbency. Convulsions, coma, and death may follow unless treatment is given quickly. In addition to the treatment described above, some sedation may be required to control the convulsions until the animal has recovered.

Phosphorus deficiency The role of phosphorus deficiency is not exactly clear. Some authorities consider that a phosphorus deficiency (<1.3mmol/L) may delay response to treatment and recovery from a calcium deficiency. In some areas, phosphorus deficiency is associated with a postparturient hemoglobinuria.



Treatment The organic phosphorus preparation toldimphos (10-25 mL) may be given by intravenous, intramuscular, or subcutaneous injection. Alternatively, half the dose may be given intravenously and half by intramuscular or subcutaneous injection.

Ketosis This is rarely an acute cause of recumbency in the immediate postparturient period. It may occasionally be an ongoing problem from a preparturient pregnancy toxemia, especially when associated with fatty liver disease. The condition is potentially very serious in the immediate postparturient phase, especially if the animal is not eating.

Treatment Is by intravenous glucose therapy, oral propylene glycol, and steroids given by intramuscular injection. For further details of treatment, see Chapter 2.

Septicemia/toxemia

Acute mastitis This condition, especially in the form of environmental mastitis associated with *E. coli* or *Streptococcus uberis* infection, may develop immediately before, during, or after calving. These life-threatening problems may be so acute that the animal is already gravely ill and unable to rise before they are recognized. For this reason, the udder of every calving cow should be actively checked to see if mastitis is present. One or more quarters may be affected and become very hard to the touch. The milk is thin, watery, and may be green or brown instead of having the normal creamy appearance of colostrum. In the very early stages, body temperature may be elevated but as toxemia develops it falls rapidly to normal or below. Diarrhea may be present in severe cases and renal failure may also occur.

Treatment Requires aggressive therapy with intravenous antibiotics, non-steroidal anti-inflammatory drugs, and fluids. Frequent stripping of the affected quarter is also beneficial.

Acute septic metritis (see above) May cause recumbency but does not normally develop until 2-3 days after calving. Other septicemias, such as black-quarter, may occur in the postparturient cow and their presence should be detected during the careful and methodical clinical examination required for such cases.

Peritonitis This may develop as a result of uterine rupture (see above) and is likely to reach its greatest severity 72 hours after parturition rather than in the immediate postparturient period.

Nerves, muscles, bones, and occasionally other tissues may be involved.

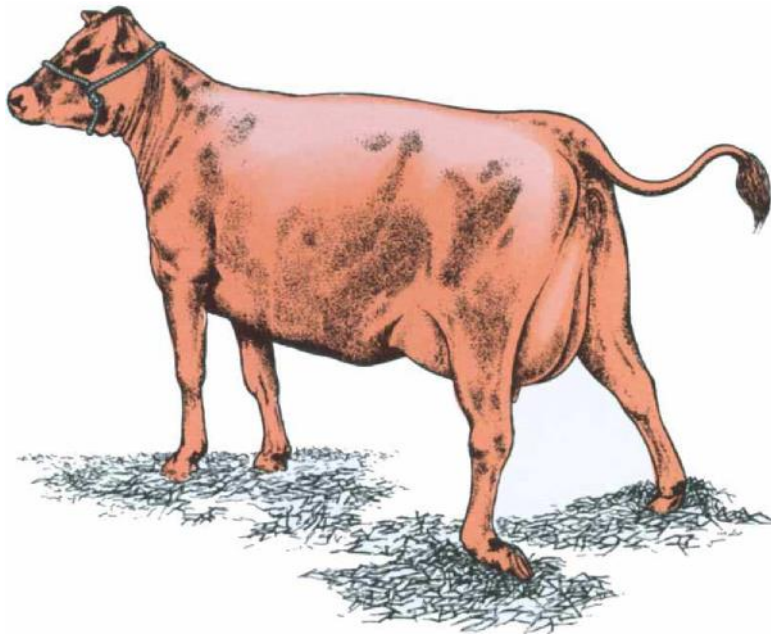
Obturator paralysis Caused by fetal pressure on the obturator nerves as they pass from the lumbosacral plexus along the medial surface of the ilia and through the obturator foramen on the pelvic floor. There is often a history of dystocia and in particular of the fetus becoming lodged for a period of time within the pelvis as, for example, in stifle lock. The affected cow is unable to



adduct her hindlimbs and in severe cases may be unable to rise (Fig. 13.8). Walking is difficult and if the surface is slippery the legs may splay out laterally and the adductor muscles may become stretched and damaged. If the cow is unable to stand she may be found in sternal recumbency with her limbs held in a very abnormal lateral position.

Treatment Is non-specific. Good nursing care is essential. The cow should be placed on a non-slip surface, which will aid her attempts to rise. The hindlimbs may be tied together just above the fetlocks with soft rope allowing approximately 20 cm space between them. This will prevent them splaying laterally in an uncontrolled manner.

Peroneal paralysis Paralysis may develop in cases where the cow has been in prolonged lateral recumbency during calving or dystocia and has sustained pressure damage to one, or occasionally both, peroneal nerves. The cow is usually able to rise and stand but is unable to extend her fetlock on the affected side. The fetlock joint knuckles over in a fully flexed position and the anterior surface of the distal limb may become



Postparturient cow showing signs of obturator and peroneal paralysis.



excoriated (Fig. 13.8). Response to nursing care is usually good and the affected leg returns to normal within a few days to 2 weeks, although a degree of weakness may persist for longer in some animals. Bandaging of the distal limb will reduce damage due to excoriation during the recovery period. Less commonly, the whole of the sciatic nerve (of which the peroneal nerve is a branch) may be affected and the cow's legs are held rigidly forward. This posture may also be adopted if there has been spinal damage involving upper motor neurons.

Etiology Most of the causes of recumbency mentioned above can become chronic and the patient suffering from them becomes a downer cow. The chronic nature of the recumbency means that - as a result of damage through compression of muscles and nerves - the condition may become self-perpetuating and often worsen with time.

History A full evaluation and re-evaluation of the history should always be undertaken. Answers to the following questions should be sought (if the obstetrician attended the original calving case or the recumbency

at an earlier stage many of the answers will already be known):

- How long has the cow been recumbent? The longer the recumbency, the poorer the prognosis.
- Has she been up at all since calving and if so for how long? Could she have fallen and suffered more severe injury during an attempt to rise? If she has been up the prognosis is better than if she has never risen after calving.
- Was she assisted at calving and if so what was the nature of this assistance?
- At treatment has the farmer given already? What drugs and what dose or volume was used? Was the treatment appropriate or could further damage have been done? Was the cause of the original recumbency known or diagnosed? If the cow was known to be hypocalcemic and was treated with a correct dose of calcium borogluconate then the persistent recumbency may not be associated with persistent hypocalcemia.
- Has there been any response to treatment so far? Did the animal improve and then deteriorate. Has the cow been milked and how much milk was taken? Excessive milking after milk fever may pre-dispose to a relapse.
- Has the cow attempted to rise? If so can the farmer describe *exactly* what she did? For example, was she able to use one or both limbs, etc.?
- Did she have any problems during pregnancy and if so what were they?
- How was she fed and managed during pregnancy, and especially during the last few weeks? Have any other animals in the group been affected?



- Is the surface on which she is lying suitable for her to stand on if she attempts to rise?
- How much nursing care is and will be available? How valuable is the patient and is the owner prepared to pay for blood tests and other investigations?

Clinical examination This must be thorough and comprehensive. As in the case of recent recumbency, the list of possible causes (see above) is very large and the clinical examination must therefore cover the whole body and all its systems. Signs of the secondary consequences of recumbency, such as myositis and bed sores, should be carefully sought.

Prognosis The obstetrician is often under great pressure to give a firm prognosis about the likelihood of recovery. The cow may be very valuable; her future economic performance may be very important; economic



considerations and welfare issues must also be borne in mind. The farmer may be happy to pay for continuing treatment if the prognosis is thought to be good. If the prognosis is poor, prolonged and expensive treatment cannot be justified. In some cases the prognosis is very clear. An oblique mid-shaft femoral fracture in an elderly, heavy cow has a poorer prognosis than the cow that has very mild peroneal paralysis in one limb.

The following observations may be, with the case history, of important prognostic and diagnostic value:

- *The nature of the recumbency:* if the cow is flat on her side she may be terminally ill from almost any major disease. If she is on her side despite adequate CaMgPD therapy the prognosis is generally poor. If she is in unsupported sternal recumbency the prognosis is better. The position of the limbs (discussed above) may indicate specific nerve damage.

- *State of alertness:* hyporesponsiveness may indicate a persistent hypocalcemia. Hyperresponsiveness may indicate a persistent hypomagnesemia. In both cases biochemical analysis may confirm whether either element is really deficient. Chronic hyper-responsiveness may suggest the possibility of BSE, which should be considered in the UK.

- *Attempts to rise:* if the cow is almost able to get to her feet and tries to stand frequently the prognosis is better than if she lies passively and makes no attempt to stand even if encouraged to do so. Spontaneous movement around the box or field is also a good sign.

- *Appetite:* an interest in food, a good appetite, and cudding are all good prognostic signs.

- *Biochemical evaluation:* the muscle enzymes creatine kinase (CK) and aspartate aminotransferase (AST) rise rapidly in recumbent animals and to some extent indicate the degree of primary or secondary muscle damage sustained. Serial evaluation of these enzymes, although costly, can be of major prognostic value. Levels of CK and AST that continue to rise rapidly despite good nursing care over a period of 3 days suggest continuing muscle damage caused by pressure. A very poor prognosis is indicated, as it is with rising levels of blood urea.

- *The progress of the case:* the case that shows a daily improvement, albeit a slight one, has a more favorable prognosis than the case whose condition remains unchanged or deteriorates. In many cases it is clear within a few days whether the patient is improving.

- *Help available on the farm:* proper nursing of the recumbent cow (see below) is demanding in terms



of time and physical effort. On many farms, nursing is sustainable for perhaps 1 or 2 days but after that, unless obvious and substantial improvement is made, it becomes less feasible. A sole attendant may be quite unable to roll the cow from one side to the other as is required in nursing care.

Treatment Involves specific treatment for any diagnosed abnormality and non-specific nursing care:

1. If there is doubt concerning the cow's mineral status, more should be given, especially if indicated by reduced blood levels.
2. Specific diseases such as acute mastitis and fatty liver disease should receive a normal, specific course of treatment for that disease.
3. Nursing care should include the following measures:
 - a. Provision of appetising food and water within reach. Placing food just beyond the cow's reach may sometimes encourage her to move (if she is able to do so).
 - b. The cow should be kept in sternal recumbency but lying on one hindquarter or the other. She should be rolled onto the other quarter four times daily. Pressure points and dependent areas like the ventral abdominal wall must be regularly checked for evidence of impending problems like pressure ulcers, urine scalding, orblowfly strike. At-risk areas should be washed in clean soapy water, rinsed and dried before petroleum jelly (VaselineTM) is applied.
 - c. Care of the udder is most important. If the udder is producing milk it should have some milk removed at intervals to prevent an uncomfortable build-up. The udder must be monitored carefully for evidence of mastitis.
 - d. The floor surface must not be slippery. A deeply bedded box or a grass field (if the weather is good) may be used. If the animal is able to stand but is unable to adduct her legs it may help to tie them together with soft rope leaving a space of about 20 cm between them.
 - e. Lifting the cow is helpful to establish whether she can take her own weight if raised to the standing position. It also enables a detailed examination to be carried out on her legs and the dependent parts of her body. The legs can also be massaged to encourage good circulation. A number of lifting devices are available. The Bagshawe hoist is fixed onto the

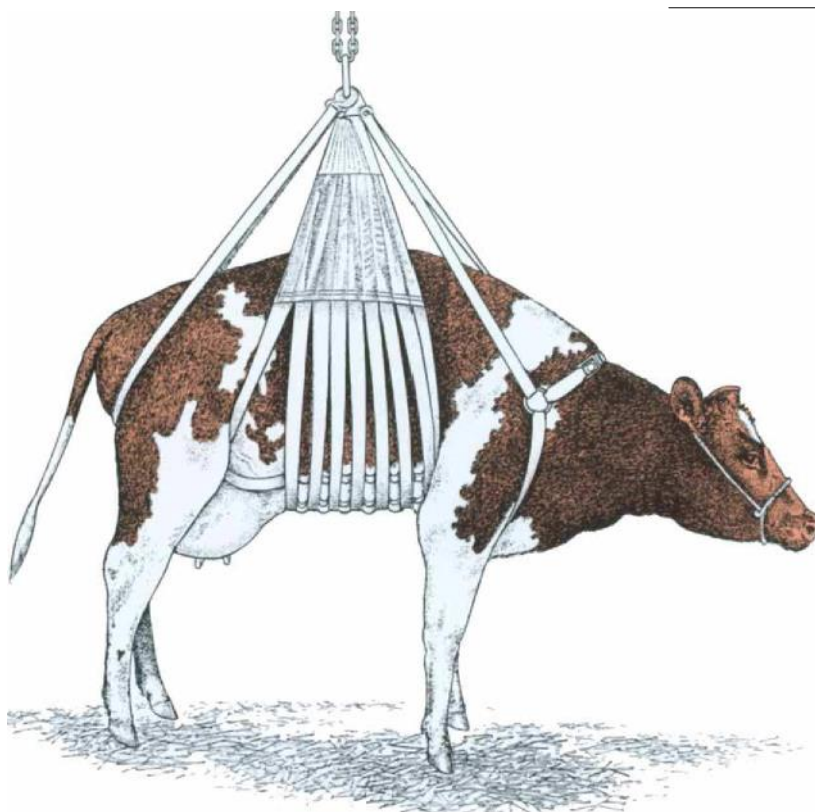
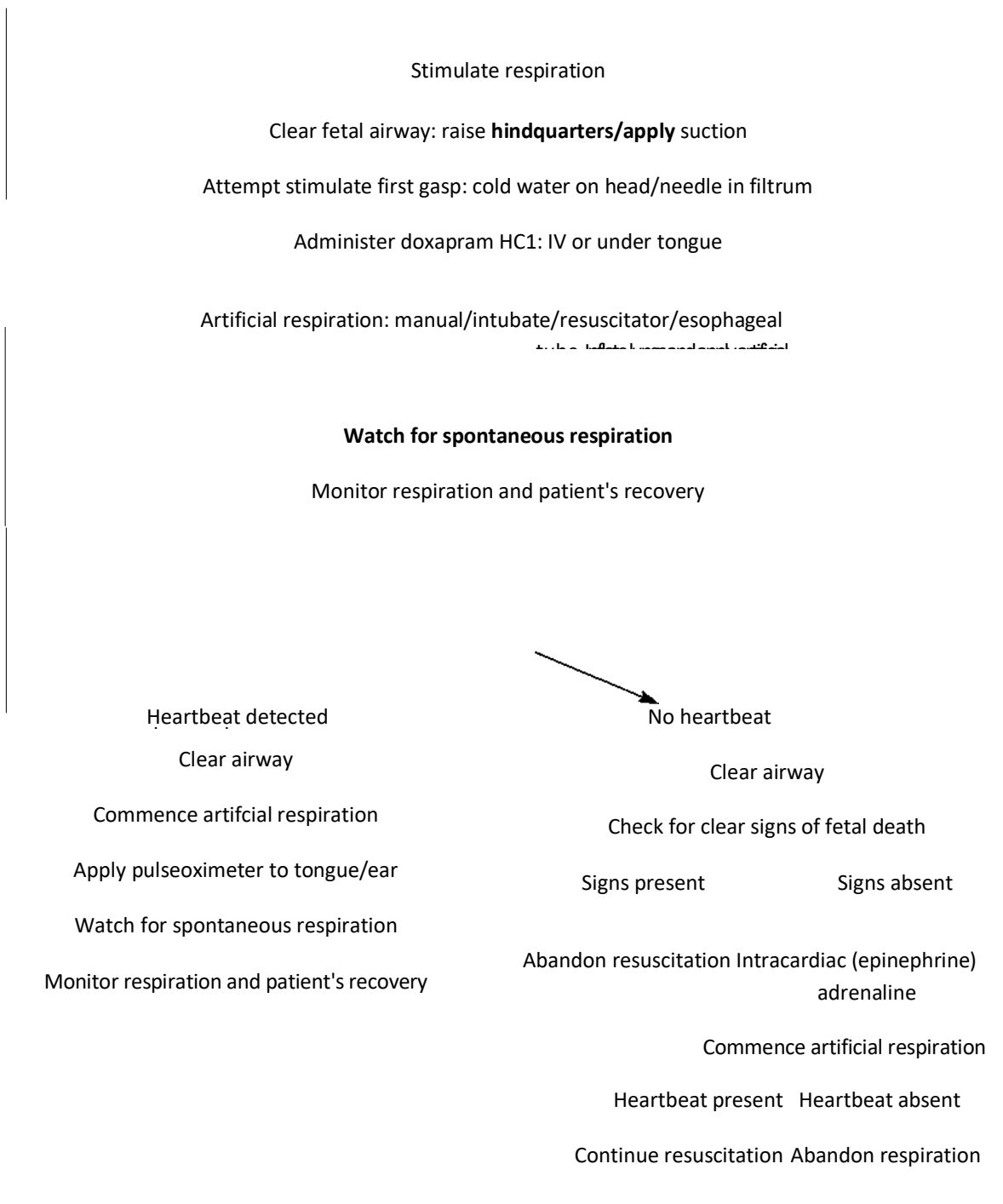


Figure Harness for lifting a recumbent cow (Downkow harness; A. Murray Ltd, Chilworthy, UK).



- **POSTNATAL CHECK OF THE COW**





Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

3. What are post-operative health problems of animals (6 points)

4. Discuss methods of resuscitating calf(7points)

5. What are causes of post-operative recumbence (7points)

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

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

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information sheet-2	Providing clean and comfortable area for lactating animals as directed by the supervisor.
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As discussed for pregnant animal, lactation animal also should get clean and comfortable area. There should be separate pen for dam and calves, as discussed for pregnant animal.



Information sheet-3	Providing appropriate and sufficient food and clean water for lactating animal
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Metabolic diseases are diseases caused by deficiency of nutrition during pregnancy and lactation. Including deficiency of calcium (hypocalcaemia), magnesium (Hypomagnesaemia), glucose (hypoglycemia which further cause Ketosis), etc.

5.1 Pregnancy toxemia

This is a condition that is directly related to pregnancy and may threaten the continuation of pregnancy and the life of the animal and its offspring. The condition and its management are very important to the obstetrician and will be considered in summary form here. For full discussion of the biochemical pathways involved in its etiology and a more detailed consideration of its medical treatment appropriate textbooks should be consulted. Hyperlipidemia in ponies and donkeys is also frequently related to pregnancy and early lactation and is discussed below. **Pregnancy toxemia in cattle is discussed below**

- **Incidence** The condition is quite uncommon but may affect both beef and dairy cattle. It is seen in beef heifers, especially those carrying twins, and may follow a sudden deterioration in the quality of their diet in late pregnancy. Bad weather may also predispose to the disease. It is also occasionally seen in the form of an out-break in dairy cows, which develop fatty liver disease in late gestation. The condition has also been seen in overweight beef cows.
- **Etiology** An energy deficit: the energy demands of the mother and offspring are not being met by the dietary energy intake. A sudden deterioration in the quality or quantity of the food in late gestation can predispose to the disease. In dairy cows, attempts to reduce the incidence of milk fever by drastically reducing their diet in late pregnancy may actually predispose to pregnancy toxemia. This is likely to occur if the cows are overweight and prone to fatty liver disease. In beef heifers the presence of a second fetus doubles the fetal energy demand.
- **Clinical signs** The condition is seen in the last 2 months of pregnancy and especially in the last few weeks. The animal is often dull, anorexic, and loses weight quite rapidly. The feces are scant and covered in mucus but later on in untreated cases a severe diarrhea may be seen. Rumenal activity is reduced or absent and an acetone-like odor is detected on the breath. If the condition is unrecognized the animal may attempt to calve at term. She may be too weak to do so and may die during or after calving. When a case of pregnancy toxemia is seen the unborn calf should be examined to check (as far as possible) its health by rectal examination and by ultrasonography if necessary.
- **Clinical pathology** The patient is hypoglycemia, hyperketonemic, and ketonic. Blood 13-hydroxybutyrate and volatile fatty acid levels are elevated. In some cases fatty liver disease is present and liver enzyme assays, bile salt



assays, and liver function tests may suggest dysfunction of that organ. A liver biopsy can be taken to confirm the diagnosis.

- **Diagnosis** Although rare, the condition must not be forgotten in animals showing signs of dullness and anorexia in late gestation. Ketosis can also readily occur in animals that are anorexic for other reasons and hence a full clinical examination and evaluation of the patient is always necessary.

- **Prognosis** This must always be guarded as the out-look for both cow and calf may be uncertain. Untreated cases may die within 7-14 days. The prognosis is especially poor in those animals that are not eating at all. If the animal is eating, even a little, the prognosis is still guarded but more favorable.

- **Treatment** Early diagnosis and aggressive treatment are required if the patient's life and that of her calf (or calves) are to be saved: 400 mL of a 40% glucose solution is given by intravenous injection; 200 mL propylene glycol is given as an oral drench. Treatment

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- with the latter may be required for up to 5 days if the patient is not eating.

Steroid therapy can be used but it should be remembered that it may induce birth, although this may in fact be desirable.

- Induction of birth is required if the patient does not show a rapid response to medical treatment: 20-30 mg of betamethasone and 500 µg of cloprostenol are given by intramuscular injection. Birth of the calf should follow 24-30 hours later. Assistance at birth may be required and the possibility of twins must be remembered. (For further details on induction of birth and alternative treatment regimens, see Chapter 15). If the patient is gravely ill and inappetent it may be necessary to remove the calf (or calves) by an elective cesarean section. The calf should survive even if the delivery is up to 2 weeks before the prospective calving date.
- Treatment of the ketosis and its underlying cause must continue after natural, induced or surgical delivery of the calf. Nursing care must be of the highest standard and the animal must be tempted with very good quality food.



Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are metabolic diseases (6 points)
2. What are causes of hypocalcaemia(7points)
3. How can you treat hypocalcaemia (7points)

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

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

Name: _____

Date: _____



Information sheet-4	Carrying out milking in a clean manner following the organizational procedure to minimize contamination and reduce incidence of mastitis.
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3.1 Carrying out milking in a clean manner

Standard milking procedures

Important to

- Produced quality milk
- Finish milk from the udder in required amount

Important equipment's are

- ✓ Milk strainer
- ✓ Pair of towel
- ✓ Waste basket
- ✓ Dipping cup glove
- ✓ Milking can
- ✓ Strip bowel
- ✓ Weighing

Important **Material** are:-

- ✓ Rope
- ✓ Disinfectant
- ✓ Milker sitting
- ✓ PPE
- ✓ Feed

Procedures of milking

1. Put on PPE
2. Assemble all the necessary clean and sanitized milking equipment's like
 - ✓ Milk strainer



- ✓ Pair of towel
- ✓ Waste basket
- ✓ Dipping cup glove
- ✓ Milking can
- ✓ Strip bowl
- ✓ Weighing

Material are

- ✓ Rope
 - ✓ Disinfectant
3. Restrain (move in to the parlor and restrain leg by rope
Avoid shouting and new things
 4. Supply feed to the animal
 5. Teat pre dip (dip the teat to remove microorganism)
 6. Wash the udder ,teats especially teats ends should be thoroughly washed with warm (110 °F) sanitizer solution
 7. Massage the udder thoroughly and dried with an individual towel
 8. Use strip cup and identify milk before direct milking
 - ✓ This is to check whether the milk is normal or not
 - ✓ If the milk read cow may be suspected of mastitis disease and lastly discarded it
 9. Place the chair and have milking bucket under the cow's udder
 10. Start milking and complete it at least with 5 or 6 minute
 - Complete milking and increasing milking frequency is important
 11. Record the milk and disinfect the teat
 12. Take away leg restrain from animal and release
 13. Continue this step to animals

Milk quality testing methods

There are four methods of testing milk quality

1. Alcohol testing
2. Clot on boiling test
3. Oreganoloptic testing
4. Lactometer test

4.2 Mastitis

Mastitis is an inflammation of the mammary gland (or glands), usually caused by bacteria. Mastitis occurs when white blood cells (leucocytes), released into the mammary gland, in response to an invasion bacteria..Milk-secreting tissue, and various ducts throughout the mammary gland are damaged due to toxins by the bacteria. Mastitis can also occur as a result of chemical, mechanical, or thermal injury. The mammary gland does not produce any milk. The udder sac is hard, tight, and firm.



Sources of mastitis infection - Although it is not known for sure how heifers contract mastitis, sources may include:

- Bacteria that are on udder skin and have the opportunity to enter the teat orifice.
- Bacteria harbored in the oral cavities of calves, which suckle other calves.
- Bacteria present in the heifers' environment, such as those found in soil, manure, and bedding material. Dirty hind feet and legs can also contaminate teat ends when heifers are lying down.
- Mastitis-causing bacteria on biting flies can be spread among heifers when flies congregate on teat ends. Research has shown that heifers in herds with fly control programs have lower prevalence of mastitis than in herds without fly control.

3.2 Abnormalities of Milk Supply

A good accessible milk supply is essential to all young animals. The first signs of a failing milk supply observed on young include becoming dull, weak, dehydrated, and disinterested. They easily fall victim to neonatal disease. As the young become weaker they fail to stimulate let-down of what milk there is and the situation becomes progressively worse. If failure started at or soon after the time of birth the neonatal animals may be colostrum-deprived. The lack of antibody protection renders them especially susceptible to infection. Colostral intake is essential in the immediate postnatal period and a good milk supply later for growth and development. Whenever neonates are ill they must be examined and treated as a matter of urgency. The health and milk supply of their mother must also always be investigated. Apparent sucking can be deceptive. The neonate may appear to be sucking well but is not actually obtaining any milk. It must be watched carefully to ensure that it is swallowing, that milk is found in its mouth after sucking. In some species it may be possible to see an increase in weight after feeding. The udder should be inspected for signs of abnormality or disease.



Aplasia of the mammary glands: total absence of mammary tissue is occasionally seen in goats. Inverted nipples in gilts should be detected when they are selected for breeding. If a number of inverted nipples are present in an animal that has farrowed, some of the litter may be deprived of nourishment. Supplementation with artificial milk may be required.

1. Failure of milk let-down: failure of this important reflex can result from a number of causes:

a. Nervous inhibition: the mother who has usually given birth for the first time is too anxious to settle down and feed her young. Providing a quiet environment will help but sedation and an injection of oxytocin may be required.

b. Inhibition *through* pain: especially common in sows if the piglets' teeth have not been clipped. Also seen in nervous mares with sensitive udders who resent the foal seeking the teat. Teeth in piglets should be clipped. Patient management is usually successful in the mare. Milk let-down can be encouraged by administration of oxytocin.

C. *Lack of stimulation of the teats by the offspring:* hypothermia, disease, hypoglycemia, and starvation may weaken the litter, who provide insufficient stimulus to cause milk let-down. This problem emphasizes the need to consider both mother and offspring in neonatal problems. Treatment of any disease in the neonates should be undertaken and milk let-down encouraged if necessary and appropriate by administration of oxytocin.

4. Illness in the dam: who is so debilitated that she is unable to produce milk. This may happen in any severe illness, including septic metritis, especially when the animal is pyrexia and toxemic.

5. *Injury to the udder:* may damage the gland to such an extent that milk production is prevented. Let-down may also be affected through pain.



Diseases of the mammary glands: Mastitis is particularly important in the immediate neonatal period in cattle. Acute environmental mastitis caused chiefly by *E. coli* and *Streptococcus uberis* may be present and life threatening at the time of birth or immediately afterwards. Full details of treatment are beyond the scope of this book. In summary, aggressive parenteral and local antibiotic therapy is required. Inflammatory changes and toxemia may be helped by non-steroidal anti-inflammatory drugs such as flunixin. Intravenous or oral fluid therapy are also very important. Mastitis in the other species mostly occurs a little later after parturition. In the ewe, acute mastitis may be caused by infection with *Staphylococcus aureus* or *Manheimia haemolytica*. Treatment is basically as in the cow. In pigs, severe mastitis caused by *Klebsiella* infection may develop soon after farrowing. Other organisms such as *E. coli* and *S. aureus* may be responsible for similar symptoms. The udder is extremely hard and signs of toxemia develop rapidly, with dark red blotches appearing on the skin of the jawl and caudal aspects of the hind legs. Treatment is by parenteral administration of antibiotics - the choice being aided, where possible, by sensitivity tests. Intramammary therapy is not possible in sows, although in desperate cases an injection can be made into the affected mammary tissues. Immediate

Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Discuss milking procedure (6 points)

2. What are causes mastitis(7points)

3. What are factors affecting milk letdown(7points)

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

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

Name: _____ Date: _____

supplies of artificial mills are mandatory for the piglets.



Operation Sheet-1	Identify presence of milk letdown
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Methods

9. Take history of delivered animal both dam and calf
10. General examination of animals by inspection
11. Restrain the cow
12. Wear PPE
13. Specific examination of mammary gland by palpation
14. Check all quarters of teat by milking
15. Identify presence of mastitis problem
16. Provide advice for clients or owner
17. Remove gloves safely
18. Clean and disinfect your hand again



LAP Test	Practical Demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2 hours.

Task-1: Do general examination of lactating animal

Task-2: Do milking procedure

Task-3: Do mastitis test



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