



# Artificial Insemination

## Level-I

# Learning Guide #38

**Unit of Competence: Support Pregnancy**

**Diagnosis to Livestock**

**Module Title: Supporting Pregnancy Diagnosis  
to Livestock**

**LG Code: AGR ATI1 M11 0919 LO2-LG-38**

**TTLM Code: AGR ATI1 TTLM 0919 v1**

**LO 2: Carry out pregnancy diagnosis**



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

- ✓ Using Personal Protective Equipment (PPE)
- ✓ Identifying OHS hazards, Assessing risks and Implementing suitable controls
- ✓ carrying Pregnancy diagnoses
- ✓ Identifying the stage of pregnancy
- ✓ Keeping records and Reporting outcomes
- ✓ Disposing Waste

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 –**

- ✓ Use Personal Protective Equipment (PPE)
- ✓ Identify OHS hazards, Assessing risks and Implementing suitable controls
- ✓ carry Pregnancy diagnoses
- ✓ Identify the stage of pregnancy
- ✓ Keep records and Reporting outcomes
- ✓ Dispose Waste

**Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4, Sheet 5 and Sheet 6”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4, Self-check 5 and Self-check 6” **in page -5, 9, 18, 28,33 and 36** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1,” **in page -37.**
6. Do the “LAP test” **in page – 38** (if you are ready)..



## 1. Introduction to Personal Protective Equipment (PPE)

**Personal protective equipment (PPE)** :-Personal protective equipment (PPE) is used by workers in various work settings. Gloves, hard hats, safety glasses, ear plugs, aprons, laboratory coats, safety shoes, respirators, helmets, goggles, or other garment or equipment designed to protect the wearer's body from injury by blunt impacts, electrical hazards, heat, chemicals, and infection, for job-related occupational safety and health purposes. Items such as fire extinguishers, first aid kits are equipment to support the personal protection of the subject.

Appropriate personal protective equipment must be selected and checked before the materials and equipment's can use Based on the activities. When a hazard cannot be removed from the work place PPE must be considered.

**NB.** PPE does not eliminate hazards from the workplace but places a barrier between the worker and the hazard. If the PPE fails or is not used properly, the worker will be exposed.

In order to ensure that workers are provided with correct PPE, and that the PPE is used properly, the Occupational Safety and Health Administration (OSHA) has developed standards for certain types of PPE. The employer must provide to employees certain PPE when a workplace hazard assessment reveals the need for its use. Standards have been developed for hard hats, work shoes, gloves, eyewear, and respirators.

### 1.1. Types Of Personal Protective Equipment

There is a large variety of PPE available. It can range from simple safety glasses to full body suits. The selection and proper use of PPE is vital to health and safety on the job. The following is a current list of PPE recommended



➤ **Duties related to PPE;**

1. Provide handlers with the PPE in pregnancy Diagnosis , and sure it is;
  - Clean and in operating condition
  - Worn and used correctly
  - Inspected before each day of use
  - Repaired or replaced as needed
2. Be sure respirator fit correctly
3. Take steps to avoid heat illness.
4. Provide handlers a Chemicals free area for
  - Storing personal clothing not in use
  - Putting in PPE at start of task
  - Taking off PPE at end of task
5. Do not allow used PPE to be worn home or taking home Care of PPE
  - Store and wash used PPE separately from other clothing and laundry.
  - If PPE will be reused, clean it before each day of re use, according to the instruction from the PPE manufacture unless the pesticides labeling specifies other requirements. If there are no other instructions, wash in detergent and hot water.
  - Dry the clean PPE before storing
  - Store PPE away from other clothing and away from pesticides areas.
  - Replacing respirator purifying elements

Use appropriate Personal Protective Equipment's as of the regulations and rules in the requirements.

- Some of the important personal protective equipment's that are used in Pregnancy diagnosis work are: -

**1. Sun hat: - protect the head sun radiation**

**2. Respirator:**

- ✓ Protect dusts or moldy and any power emitted while working on livestock.
- ✓ Used in silos, manure storage areas,



- ✓ It is used in the storage, preparation and application of chemicals and / or Pesticides in the Workplace or the Farms. There are two types of respirators:

**I. Air-purifying respirators:**

**ii. Combined-filters respirators:** - Used for the use of pest control chemicals.

**3. Goggles:** - protect eye from dust, chaff, and chemicals

**4. Protective gloves:** - should be used for certain jobs when rounding abrasive Mater jobs

- **Rubber gloves** – used around sick animals or w/n assisting at birth
- **Full Hand Sized Gloves-** Used while diagnosing the pregnant animals for checkup.
- **Treatment Glove-** Use during treatment provision for the animals.

**5. Safety boots (steel capped boots/shoes)** – used while working in the dairy farms

## **1.2. Resources required for pregnancy diagnosis**

The examiners must wear proper clothing including coveralls, gum boots and disposable plastic or rubber full arm sleeves. This is essential to protect the examiner from contracting zoonotic disease and spoiling his clothes. Separate trousers and shirts made of dark coloured (green or blue) slightly thick cloth are easier for working compared to a single cover all. Plastic long sized aprons are used by many clinicians in the field. Sufficient lubrication must be used while introducing the hand in the rectum. Non-irritating soap and water or liquid paraffin is a suitable lubricant.



<b>Self-Check 1</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

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

1. What does mean PPE? (3 points)
2. Write the Duties related to PPE (4pts)
3. Mention at least 4 appropriate Personal Protective Equipment's for Pregnancy diagnosis in cattle (2pts)
4. Did you believe that PPE required for different activities are similar? Why?(2pts)
5. Using appropriate PPE can completely eliminate the occurrence of Risk.(True/False) (3pts)

**Note: Satisfactory rating - 11 points and above      Unsatisfactory - below 11 points**

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

**Answer Sheet**

Score = _____
Rating: _____

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Short Answer Questions**

1. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_ 2. \_\_\_\_\_
3. \_\_\_\_\_  
 \_\_\_\_\_
4. \_\_\_\_\_  
 \_\_\_\_\_
5. \_\_\_\_\_



## Information Sheet-2

# Identifying OHS hazards, Assessing risks and Implementing suitable controls

## 2. Supporting work based OHS requirements and workplace information

Occupational health & safety system helps to perform activities in a safe environment and discard unwanted materials to protect from injury infestation. Activities that should be considered in OHS during clearing of animals, debris & waste materials are stored and removed from the working areas. Tools and equipments should be cleaned, maintained at a right time & position and stored according to manufacturer's specification and supervisor instruction.

### 2.1. Identify and report OHS hazard

#### 2.1.1. Definition of Occupational Health and safety

The definition reads: "Occupational health safety should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job."

When the materials, tools, equipments prepared and used and handled they may cause OHS hazards and they may breakdown themselves. Most of the hazard caused by: Unwise uses, handle, load and unload of materials, tools, equipments and unsafe work environment etc.

Some of the OHS hazards associated with PG works are: *Chemical and hazardous substances, Accidental hazard on the human body by cattle kick and solar radiation,*



*Zoonotic diseases, dust, noise, air and soil born microorganisms, sharp hand tools and equipment, manual handling, holes, physical damage by aggressive animals, mud, slippery and uneven surfaces.*

**The main required tasks of an Occupational Health and Safety Practitioner include:**

- Systematic evaluations of the working environment
- Endorsing preventative measures which eliminate reasons for illnesses in the work place
- Giving information in the subject of employees' health
- Giving information on occupational hygiene, ergonomics and also environmental and safety risks in the work place

**2.2. Apply OHS requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include:**

- using of relevant protective clothing and equipment,
- use of tooling and equipment,
- workplace environment and safety handling of material,
- use of enterprise first aid,
- Hazard control and hazardous materials and substances.
- using gowns, rubber boots of appropriate size, goggles, respirators, cap, and gloves
- following Occupational health and safety procedures designated for the task
- Checking and fulfilling required safety devices before starting operation.

**❖ Apply safe operating procedures and OHS requirements regarding:**

- ☞ Restraints safety,
- ☞ Handling of PG and operation,
- ☞ Handling of PG manual in the work place ,
- ☞ Working in proximity to animals.
- ☞ Apply emergency procedures :
- ☞ emergency shutdown and stopping of equipment

**➔ 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.

### **General occupational hazard safety precautions**

- Understanding of the root causes of the specific occupational hazards such as, chemical hazards, Zoonotic Disease like brucellosis, rabies, bovine tuberculosis, toxoplasmosis ,RVF ,cysticercosis ,hydatidosis and other work place hazards.
- Taking measures for each source of hazards, before or after they are occurring. These safety precautions include work place clothing's like over all, gloves, or nose covering cloth.



<b>Self-Check 2</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Time of started: \_\_\_\_\_ time finished: \_\_\_\_\_

**Directions: Answer all the questions listed below.**

1. List OHS hazards associated with PD work (2 points)
2. Applying safe operating procedures and OHS requirements must be practice regarding to:- (5 points)
  - a) \_\_\_\_\_
  - b) \_\_\_\_\_
  - c) \_\_\_\_\_
  - d) \_\_\_\_\_
  - e) \_\_\_\_\_
  - f) \_\_\_\_\_
3. List the Zoonotic Diseases associated with PD. (5 points)
4. What are the main required tasks of an Occupational Health and Safety Practitioner? (2 points)
5. **OHS** stands for \_\_\_\_\_ (1 points)

**Note: Satisfactory rating - 10 and 12 points      Unsatisfactory - below 10 and 12 points**

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

### Answer Sheet

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Short Answer Questions



<b>Information Sheet 3</b>	<b>Carry out pregnancy diagnosis</b>
----------------------------	--------------------------------------

### **3. Carry out manual pregnancy diagnosis procedures**

A variety of approaches have been evaluated and developed during the past and recent years, some of which have some limitations to their wide scale use. The methods of pregnancy diagnosis have been classified into two (direct and indirect) or three categories:-

- i) Visual methods
- ii) Clinical methods
- iii) Laboratory tests.

#### **1. Visual Methods**

##### **Non return to estrus**

When an animal is mated and it does not return to estrus the owner usually thinks that the animal has become pregnant and hence has not returned to estrus. This happens because during pregnancy, the conceptus inhibits the regression of the corpus luteum and thus, prevents the animal from returning to estrus. However, many a times the animal does not return to estrus because of non-regression of CL due to reasons other than pregnancy. Moreover, in the seasonally breeding species the animal may not return to estrus (when mating is done during the end of the breeding season) because the season was over.

An estrus and the rare occurrence of gestational estrus in cattle can affect the reliability of non-return to estrus as a method of pregnancy diagnosis. Moreover, difficulty in estrus detection and silent estrus render this method of pregnancy diagnosis unsuitable. In dairy cows non-return rates usually over estimate true pregnancy diagnosis and are also affected by the detection procedure used. Moreover, estrus expression appears to be reduced in intensity and duration in the present day dairy cows leading to lower estrus detection efficiency.



Therefore, the probability of misdiagnosis of pregnant females by estrus observation appears to be increased. This may be confounded by a small proportion of pregnant cows expressing estrus and some cows expressing prolonged inter-estrus intervals of around 24 days. Therefore, non-return to estrus is an unreliable procedure for pregnancy diagnosis in most domestic animal species.

### **Other changes**

Besides the non-return to estrus a few of other visual signs of pregnancy appearing in late pregnancy include:-

- ✓ Increase in the size of the abdomen
- ✓ Development of the udder specially in dairy heifers (4 months onwards)
- ✓ Slight vaginal discharge (from 4-5 months onward in dairy cows) and
- ✓ Movements of the fetus visible externally (especially in fed cows on the right side of abdomen 6 months onwards).

However, the accuracy of these visual diagnostic symptoms is always low and a clinician must use them as a supplement to clinical diagnosis.

## **2. Clinical methods of pregnancy diagnosis**

Four clinical methods of pregnancy diagnosis are available for pregnancy diagnosis in the various domestic farm and pet animal species

- i) Rectal palpation
- ii) Abdominal ballotement
- iii) Ultrasonography and
- iv) Radiography

### **2.1. Recto-genital palpation**

Transrectal palpation is the oldest and most widely used method for early pregnancy diagnosis in dairy cattle. In most large domestic animal species like cattle, buffaloes, mares and female camels recto-genital palpation (with some limitations) is the easiest,



cheapest and fastest method of pregnancy diagnosis with little or nil harm to the animal and its fetus when performed carefully.

Transrectal palpation is considered to be an accurate method of pregnancy diagnosis in dairy cattle for a trained veterinarian after day 35 post breeding. The procedure however, does not provide any information about the viability of the embryo/fetus during earlier stages of pregnancy.

Transrectal palpation of the amniotic vesicle as an aid in determining pregnancy status in dairy cattle was described by scientists, whereas others use slipping of the chorioallantoic membranes between the palpator's thumb and forefinger beginning on about day 30 of gestation was described as a method of diagnosis.

#### **2.1.1. Basic principle**

The genital organs lie usually on the pelvic floor during early pregnancy beneath the rectum in most species and in the abdominal cavity during late gestation. The genital organs can thus be palpated indirectly by placing the hand in the rectum evacuated of the feces. The growth of the conceptus in either of the uterine horn leads to sequential increase in the size, tenseness and palpable characteristics of the uterine cornua.

Thus, with experience the palpator can feel these changes in the uterus of a pregnant animal and with fair to good accuracy predict pregnancy depending upon the species, stage of gestation and his experience.

Two bottle necks appear to be significant while performing rectal palpation.

- i) The peristalsis that occurs in the rectal musculature, which produces obstacles in palpation and
- ii) Ballooning of the rectal wall due to entry of air inside.

The palpator must stop making movements of arm during a peristaltic wave (while still keeping his hand inside the rectum) wait for 1-2 minutes and then start palpation again when the peristalsis has subsided.



The ballooning of rectum can be easily appreciated, by the finding that the operator can move his hand up and down in the rectum without resistance when the rectum is ballooned. The operator must catch hold of a pinch of rectal mucosa and move his hand back and forth (known as back racking) without completely taking it out. This will push the air inside, to the exterior and the rectal mucosa will then be closely over the operator's hand.

### **Procedures for rectal palpation**

1. After proper restraint and wearing of proper clothing and also proper lubrication,
2. The operator must make a cone of his hand and push it inside the rectum. The anal sphincter dilates and the hand enters inside the rectum.
3. The feces must be removed without taking out the hand completely. The cervix which is a hard round to oval or sometimes caudally enlarged disfigured structure is the land mark for location of genital structures in cattle.
4. The cervix is followed further to locate the uterine body and the uterine horns. These structures can be pulled caudally when located at the pelvic brim or further, by retracting the broad ligament or hooking the inter-cornual ligament by the index finger.
5. When the pregnancy is beyond 60 days this cannot usually be done and the operator has to move his hand further in the rectum, so as to locate the intra-abdominally placed uterus and palpate other features diagnostic of pregnancy.

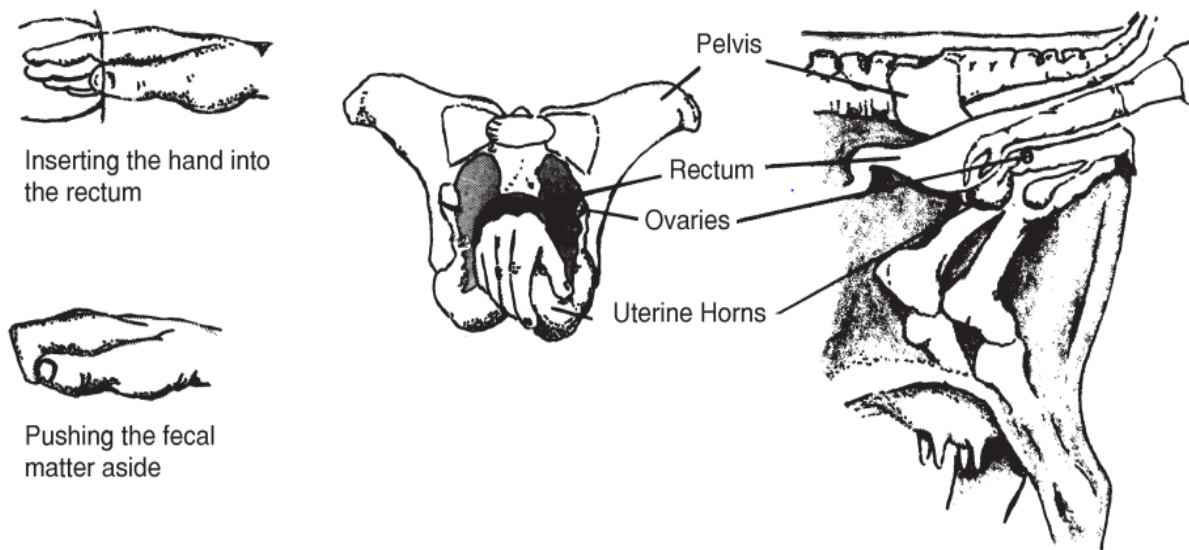
#### **2.1.2. Cares that should be taken during rectal palpation**

When performed gently and carefully rectal palpation is a non-invasive procedure. The following points would be helpful in minimizing damage to the animal and the examiner as well.

1. Ruthless movements of the hand in the rectum should be avoided. Avoid palpations during a peristaltic wave.
2. Examiners must trim their nails and avoid using dirty soiled sleeves.



3. Rectal examination without a sleeve must be avoided specially in mares to avoid contracting diseases and obnoxious odors. Sleeves must be replaced after examination of 2-5 animals, or better after each examination.
4. Rectal palpation of an animal suffering from fever should be extremely gentle or better avoided as the blood vessels are more fragile and bleed easily. Similarly examining an animal with rectal tear or rectal fistula is hazardous. Rectal palpation must be gentle.
5. Clinicians must assure that even if the animal kicks it does not harm them, and so also the palpators must also be cautious that sudden sideways movement of the animal with the operators hand inside can cause fracture of the operators arm and hence due care must be exercised.
6. Un-careful palpation of the uterine horns with undue pressure can cause rupture of the amniotic vesicle and loss of an early pregnancy and hence this must be avoided.



**Figure: -- Position Of the hands in palpation**



### 2.1.3. Consequences of improper palpation

Because pregnancy in cattle can be terminated by manual rupture of the amniotic vesicle many studies have investigated the extent of iatrogenic embryonic mortality induced by transrectal palpation.

Although controversy still exists regarding the extent of iatrogenic embryonic mortality induced by transrectal palpation, other factors have a greater influence on calving rates than pregnancy examination by transrectal palpation.

Two things must be kept in mind by clinicians in making positive diagnosis of pregnancy by rectal palpations in cattle.

- The first is, that when the palpator is unable to detect any of the palpable characteristics mentioned here in, he must neither comment positively or negatively as both would be frustrating both to the clinician and the owner on a later date. He must better admit the fact that he is not able to detect out properly and the animal must be re-submitted for examination 15-30 days later preferably after a fasting.
- The second thing that clinicians must keep in mind is the accuracy of the gestation period (this is especially applicable for the 5-8 month period in cattle). An approximation of the gestation period must be conveyed to the owner rather than an accurate period.

When pregnancy examinations are made early (Day 30-45) the possibility of an early embryonic death must be kept in mind and a confirmation of pregnancy must be done only after re-examination at a later period (60-90 days). Owners often consult veterinarians on the fetal viability during mid to late gestation.

It is often difficult to comment positively by a single rectal palpation. Until unless characteristic changes in the uterus and fetus are palpable negative comments must better be avoided. The usual test for fetal viability during this period is the movement of





the fetus in response to a stimuli by the examiners hand (movement of a fetal leg when pressed by hand or suckling movements by the calf when a finger is touched in the mouth) however, this may be sometimes misleading specially when the fetus is depressed.

## **2.2. Abdominal ballottement**

Abdominal palpation and abdominal ballottement of the fetus is possible to some extent in cows during late gestation (7 months onward). In sheep and goats rectal abdominal palpation (by using a glass rod placed in the rectum to lift the uterus which is palpated through abdomen. Similarly bimanual palpation for pregnancy diagnosis (palpation of uterus through fingers in the rectum and lifting the abdomen) has been reported for small. However, both the methods are inaccurate and the first method is often invasive. Palpation of fetuses through the abdomen is possible in sheep and goat only beyond 4 months of pregnancy by lifting the abdomen held between both hands and location of bony fetal structures.

In cattle abdominal ballottement is performed by placing the fist over the lower right abdominal wall and pushing it in an intermittent manner in a dorsal medial direction deeply. The fetus can be felt as a hard solid object floating in fluid. This is usually possible in lean cows after the 7th month of gestation.

## **2.3. Radiography**

To a limited extent radiography has been used for pregnancy diagnosis in the small ruminants (sheep and goat), the companion animals (dog and cat) and rarely in pigs. The technique is known to be good in evaluating fetal numbers in the bitch and cat, but is poor in evaluating fetal viability. Moreover, the high cost and the hazards of exposure to growing fetuses to x rays limit the use of radiography as a routine procedure, and warrants its use in specialized cases. Mostly, a single radiograph taken with the animal in lateral recumbency is sufficient however; sometimes a dorsal or a dorso ventral view may be required. In sheep and goat, fetuses are visible by day 70 of gestation with a high accuracy.



## 2.4. Ultrasonography

Ultrasonography has gained popularity in veterinary medicine and has become the method of choice for diagnostic imaging of the various organs of the body, including reproductive organs. Ultrasound is a high frequency sound wave. Sounds audible to the human ear vary between 20 to 20,000 Hertz (Hz) (Cycles per second) while ultrasound waves are of frequency higher than this, and for most diagnostic applications frequencies of 1-10 MHz are used. Ultrasound cannot be propagated in vacuum and in gas, transmission is poor.

Reflection of ultrasound occurs between substances of different acoustic impedance (defined as the product of the velocity of sound in a substance and the density of the substance). Even the short distance between the transducer (which emits and receives ultrasound signals) and the patient must be bridged by a suitable coupling gel.

### Ultrasound examination



Figure Pregnancy examination using ultrasound and Examples of Ultrasound Images during Pregnancy( From Left to Right)



<b>Self-Check 3</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Time of started: \_\_\_\_\_ time finished: \_\_\_\_\_

*Directions:* Answer all the questions listed below.

1. Explain the methods of Pregnancy diagnosis. ( 3points)
2. Explain the clinical methods of PD. ( 3points)
3. Determine the time the palpator should readmit if he unable to detect properly. (2 points)
4. Determine the time the confirmation for of pregnancy takes places after re-examination. (2 points)
5. Explain the care that should takes place during recta palpation. (5 points)

**Note: Satisfactory rating - 10 and 12 points      Unsatisfactory - below 10 and 12 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

#### Identifying the stage of pregnancy

#### 4. Developmental Stages

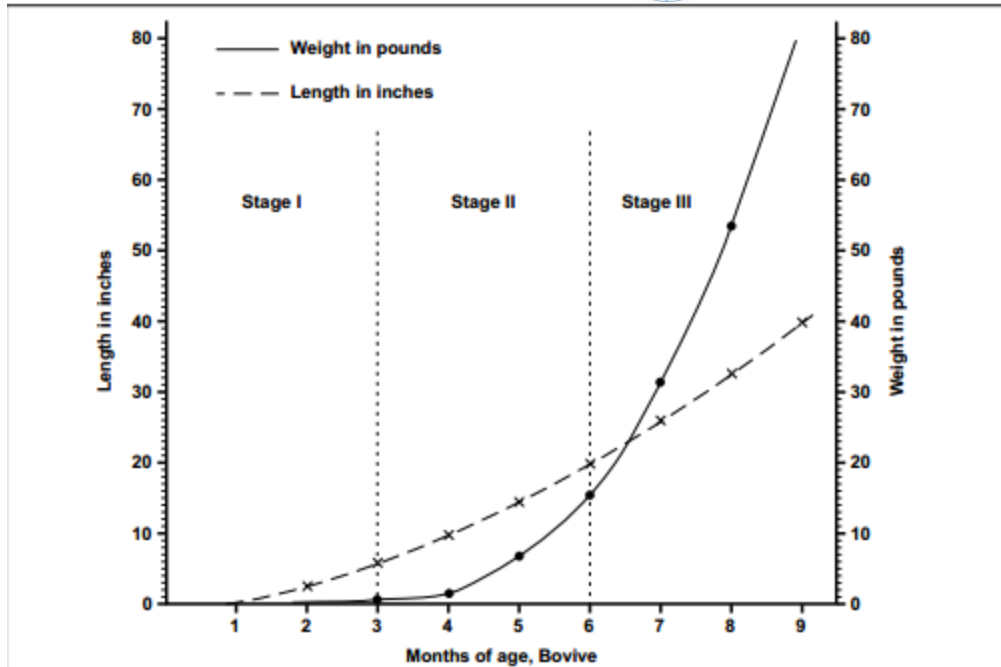
There are three main periods of development in a young calf's life. The period of the ovum is that time from fertilization until the egg has divided enough times to take on a particular form. This occurs on about the thirtieth day, when there is an enfolding of the layers of the developing egg. At this stage, the newly developing animal is called an **embryo**.

The period of the embryo lasts until the fetal membranes begin to attach to the lining of the uterus, approximately 38 days. During the embryonic stage, various organs and systems are laid down. These include:-

- The respiratory system
- Nervous system
- Digestive system
- Circulatory system and
- Reproductive system.

The embryo, as it develops, floats freely in the uterine cavity, bathed by a secretion called uterine milk.

When the embryo is about 38 days old, the fetus period begins. This term is used until the newborn is expelled at parturition (birth). During the fetus stage, continued attachment takes place at the numerous caruncles lining the uterus. These attachments provide transfer of nutrients and waste materials for the developing fetus. Birth occurs about 280 days after fertilization.



**Figure**\_\_\_ Growth of fetus, Parturition occurs approximately 280 days after fertilization.

### **Determining Stages of pregnancy**

#### **Stage I: 30- to 35-day pregnancy**

Embryos at this early stage are delicate, and beginning palpators should not try to feel them. But an experienced palpator, with skill and practice, can detect pregnancy as early as 30 days after breeding. Palpation at this early stage should be accompanied by good breeding herd records. These records let the palpator know the approximate breeding date of the animal.

In the early stage of pregnancy, the uterus, filled with a small amount of fluid, will feel slightly thin-walled. One horn is enlarged a little more than the other. At this stage you can determine the presence of the embryonic vesicle by carefully running the horn between your fingers in a milking action; you can feel the vesicle slide through your fingers.

At this stage, the embryo is only about ½ inch long. The vesicle surrounding it is about ¾ inch in diameter and filled with fluid, like a balloon filled tightly with water. However, the borders of this vesicle are indistinct, and what you actually feel is something slightly smaller than a marble as it slides through your fingers.



The uterus, in much the same location as a nonpregnant uterus, has not been displaced because of size or weight at this time. The outer embryonic vesicle, which occupies both horns, is rather thin with little fluid, and may be 18 to 24 inches long. By pinching the horn of the uterus carefully, you can feel the membranes of this vesicle as they slip between your fingers.

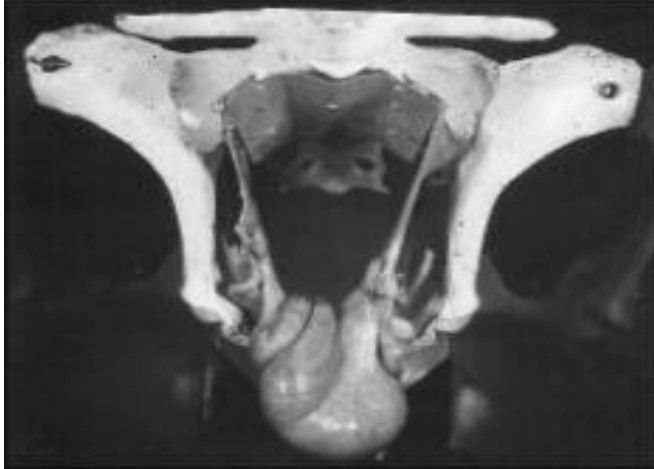
### **Stage I: 45-day pregnancy**

Most palpators prefer that bulls be separated from cows at least 45 days before pregnancy determination. At 45 days, the horn of the uterus containing the fetus is somewhat enlarged and thinner-walled compared to the other. The fetus at this stage is about 1 inch long. The vesicle around it is egg-shaped and measures about 1 to 1 1/2 inches long.

You can feel the outer membrane, which contains fluid, through the uterine wall. The attachment of the membranes to the uterus has just taken place at about 38 to 40 days. Therefore, avoid moving the fetus about in the uterus. The caruncles on the uterus join the cotyledons on the fetal membranes for nutrient exchange. Slipping of the fetal membranes is a valuable aid to early pregnancy determination. Although the membranes can be slipped at any stage of gestation, it is easiest to perform and of the most value between 40 to 90 days of pregnancy. The procedure involves picking up and gently pinching together the walls of either uterine horn and feeling the fetal membranes as they slip between the thumb and fingers. Palpators should be gentle when using this technique since the embryo and membranes are rather delicate in pregnancies under 45 days.

### **Stage I: 60-day pregnancy**

The uterus has enlarged until one horn is about 2 1/2 to 3 1/2 inches in diameter, measuring 8 to 10 inches long. The weight of the contents may pull the uterus into the body cavity just over the pelvic brim (Figure 10). The fetus has grown rapidly, and, at this stage, is about 2 1/2 inches long. The embryonic vesicles are still prominent and, at this stage, may be felt without feeling the fetus.



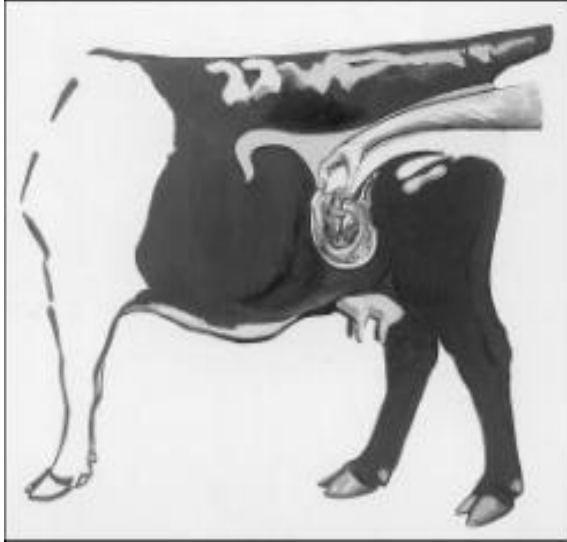
**Figure \_\_\_ 60-day pregnancy. Uterus may hang over pelvic brim**

The uterine walls have thinned considerably. The best method of feeling the fetus is to bobble it with your hand so that, if you gently tap the uterus, the fetus swings like a pendulum and hits against the wall of the uterus and vesicle. The cervix remains on top of the pelvic cradle with the uterine horns moving toward, and possibly beyond, the brim.

**Stage I: 90-day pregnancy**

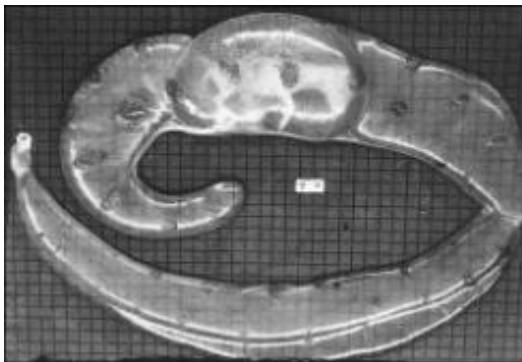
The uterus will have enlarged considerably by this time, filled with fluid and increased growth of the fetus (Figure below). The fetus now is about 6 1/2 inches long and may have displaced itself into the abdominal cavity, indicating that the uterus has stretched. The cervix may be pulled over the pelvic brim, but the cervix, body, and horns of the uterus are within reach. In larger animals, this is a difficult stage for pregnancy determination because of displacement and the distance from the anus to the developing fetus.

You may have to consider factors other than the presence of the fetus itself at this stage. Displacement of the uterus, a possible indication of pregnancy, should be considered. Another indication of pregnancy is enlargement of the uterine arteries with their characteristic pulsation. These arteries (one for each uterine horn) are located in the forward fold of the broad ligament (Figure 13) which supports the uterus.



**Figure \_\_\_ Position of 90-day fetus. The fetus is now about 6 1/2 inches long and has displaced itself over the pelvic brim and down into the abdominal cavity.**

In a 3-month pregnancy, the artery supplying blood to the pregnant uterine horn is about 1/8 to 3/16 inch in diameter. The artery feeding the non-pregnant horn is only half that size. When you grasp the artery, you can easily feel the pulse of the heartbeat as blood is carried into the uterus to nourish the developing fetus. Do not confuse the uterine artery with the femoral artery lying on the inside of the thigh which supplies the hind legs. The femoral artery is located in the muscle but may be palpated. Remember that the uterine artery is in the broad ligament and can be moved 4 to 6 inches, while the femoral cannot.



**Figure \_\_\_ 79-day fetus, with surrounding membranes filled tightly with fluid. Grid scale 1/2 inch.**





The best indication of pregnancy, if you cannot reach the fetus, is the presence of buttons. In a 3-month pregnancy the buttons are flattened and egg-shaped and measure 3/4 to 1 inch across. Although rather soft to the touch, they are firmer than the thin-walled uterus. The membranes still are filled tightly with fluid.

### Stage II: 120-day pregnancy

At this stage, the fetus is displaced similarly to the 90-day fetus. However, it has grown to approximately 10 to 12 inches long. The head is about the size of a lemon. Often, the palpator can detect the head of the developing fetus before any other body part.

The enlarged fetus fills a greater portion of the abdominal cavity and is easier to feel than the 3-month fetus (Figure 13). All other characteristics have changed some. The buttons are more noticeable, since they have developed to about 1 1/2 inches in length and have a much firmer feel. The pulsating uterine artery may be palpated, and the displacement of the entire reproductive tract.

### Stage III: Over-5-month pregnancy

Because of their weight and size, these pregnancies will fall deep into the body cavity (Figure 14). Remember to reach deep into the cavity and toward the stomach floor



Figure \_\_\_ Yellow 4-month pregnancy. Tra abdominal cavity. Palpation of uterine arte

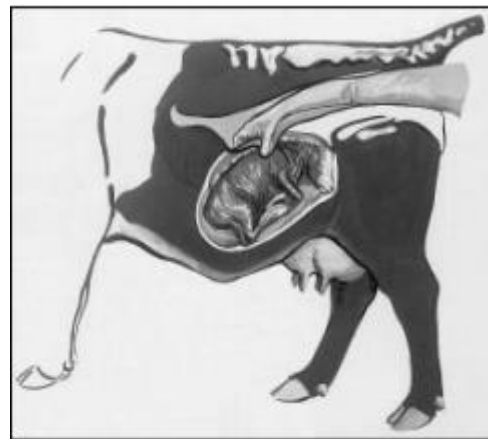
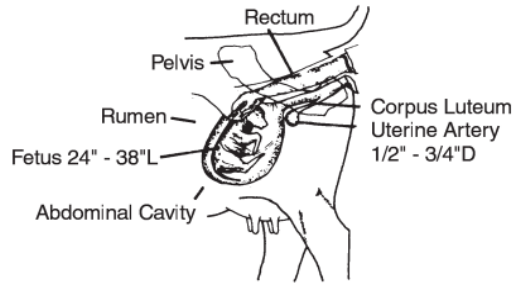


Figure \_\_\_ 5- to 6-month pregnancy. Enlarged calf now fills abdominal cavity.

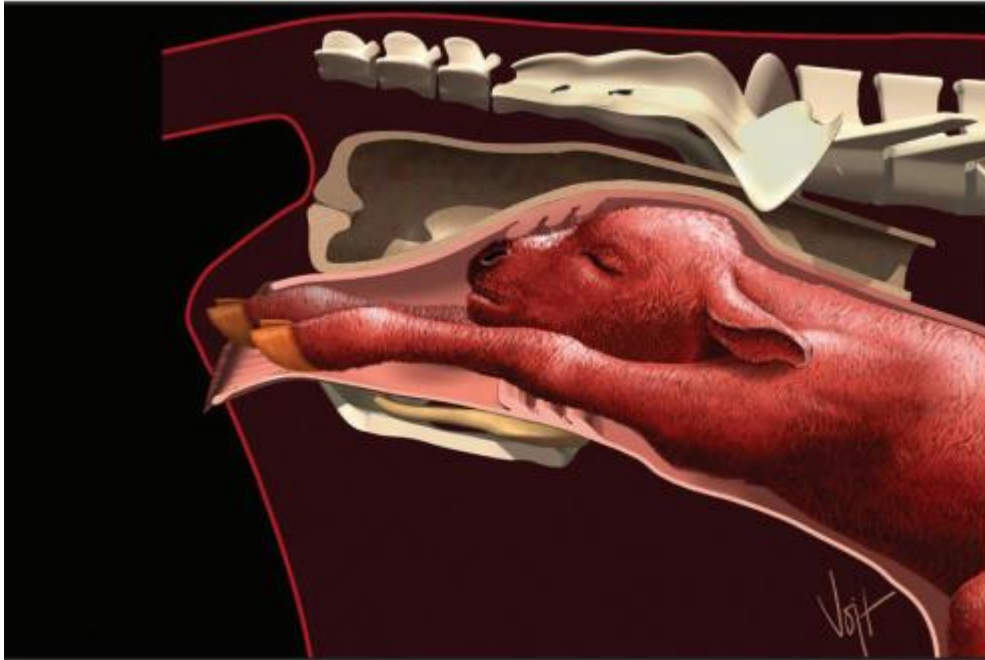


**210-DAY PREGNANCY**  
(Fetus May Be Felt)





Occasionally, these fetuses will be completely out of reach. To help confirm pregnancy, look for the presence of well-developed buttons or weight on the displaced cervix, or check the uterine arteries. The main change until parturition will be in size, as the fetus grows rapidly, using more of the abdominal cavity. Table 5 summarizes outstanding identifying characteristics.



End Result



**Table 5. Fetal Size and Characteristics Used in Determining Pregnancy.**

Stage	Days of Gestation	Fetal Size		Identifying Characteristics
		Weight	Length inches	
I	30	1/100 oz.	2/5	One uterine horn slightly enlarged and thin; embryonic vesicle size of small marble. Uterus in approximate position of nonpregnant uterus. Fetal membranes may be slipped between fingers from 30 to 90 days.
	45	1/8-1/4 oz.	1-1 1/4	Uterine horn somewhat enlarged, thinner walled and prominent. Embryonic vesicle size of small egg.
	60	1/4-1/2 oz.	2 1/2	Uterine horn 2 1/2 to 3 1/2" in diameter; fluid filled. Fetus size of mouse.
	90	3-6 oz.	5-6	Both uterine horns swollen (4 to 5" in diameter). Fetus is size of rat. Uterine artery 1/8 to 3/16" in diameter. Cotyledons 3/4 to 1" across, but very soft.
II	120	1-2 lb.	10-12	Similar to 90-day but fetus more easily palpated. Fetus is size of small cat with head the size of a lemon. Uterine artery 1/4" in diameter. Cotyledons more noticeable and 1 1/2 inches in length. Horns are 5 to 7" in diameter.
	150	4-6 lb.	12-16	Difficult to palpate fetus. Uterine horns are deep in body cavity with fetus size of large cat - horns 6 to 8" in diameter. Uterine artery 1/4 to 3/8" in diameter. Cotyledons 2 to 2 1/2" in diameter.
III	180	10-16 lb.	20-24	Horns with fetus still out of reach. Fetus size of small dog. Uterine artery 3/8 to 1/2" in diameter. Cotyledons more enlarged. From sixth month until calving a movement of fetus may be elicited by grasping the feet, legs or nose.
	210	20-30 lb.	24-32	From 7 months until parturition fetus may be felt. Age is largely determined by increase in fetal size. The uterine artery continues to increase in size—210 days, 1/2" in diameter; 240 days, 1/2 to 5/8" in diameter; 270 days, 1/2 to 3/4" in diameter.
	240	40-60 lb.	28-36	
270	60-100 lb.	28-38		



<b>Self-Check 4</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Time of started: \_\_\_\_\_ time finished: \_\_\_\_\_

*Directions:* Answer all the questions listed below.

1. Explain the organs formed during the embryonic stages of cattle. (4 points)
2. Explain the stages of pregnancy in cattle detail (5 points)

**Note: Satisfactory rating - 7 and 8 points**

**Unsatisfactory - below 7 and 8 points**

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

**Answer Sheet**

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Short Answer Questions**



<b>Information Sheet 5</b>	<b>Keeping records and Reporting outcomes</b>
----------------------------	---

### **5. Keeping records and Reporting outcomes**

To improve any practice on the dairy farm records are of paramount importance. The breeding or reproductive area can only be altered and improved if a producer is willing to put time and effort into starting and faithfully maintaining a record-keeping program. The record-keeping program can be as complicated or as simple as one wants. A producer can buy breeding wheels or other devices that can make reproductive record keeping easy. There is, however, a very simple system that can be set up by any producer.

There are many types of records that should be recorded in the dairy farm. Among that four records are essential dates a producer must record on an individual cow to improve reproductive performance:

1. Calving Date
2. Heat dates
3. Breeding dates
4. Conception date or date heifer confirmed pregnant.

#### **Calving Date**

The calving date is the most important because it starts the next reproductive cycle. You should start to record heat dates immediately after calving. Recording heat dates on cows even before they are ready to breed is important because it lets you know if the cow is cycling properly and gives you an idea of the cow's individual reproductive cycle. If you don't see a cow in heat within 50 days after calving, a veterinarian should examine her to be sure she is cycling properly and does not have an infection or other reproductive disorder. In fact, it is an excellent practice to routinely have a veterinarian check each cow soon after freshening to be certain that all of the reproductive organs are functioning properly, and to treat any abnormal cows.



## **Heat Dates**

All heat dates should be reported so that the cycle length can be estimated. A good practice is to record the days elapsed between observed heats so that you can check if the cow is cycling and if you are observing heat properly. If heats are not noticed it can be due to either reproductive failure or poor heat detection practices.

## **Breeding Dates**

Accurate recording of breeding dates is essential for successful pregnancy checks by a veterinarian. Every cow should be checked for pregnancy at 40-50 days after breeding. If it is assumed that the cow is bred just because she has not been observed in heat after breeding, it could seriously jeopardize the reproductive program. One may have several cows he thinks are bred that are open. Such cows, when dried off, will be culling candidates. This can be eliminated by having all cows that are bred and not observed in heat for 40-50 days checked for pregnancy by a veterinarian. The veterinarian is an integral part of the reproductive program. Every producer should be on a routine herd health program.

## **Conception Date**

Recording conception dates is important so that the cows are dried off at the right time (60 days before freshening). Recorded conception dates also help in assigning housing for dry cows, establishing feed requirements for fresh cows, and estimating income during the year from the sale of milk.



## Reproduction and production History Register

No.	Service		Calving			Lactation						Service Period	Calving Interval
	Date	Method	Date	Calf Sex	Weight of Dam at Calving	Length	Production	Date Dried	Days Dry	Peak Yield	Date of Peak Yield	Days	Days

### Calving registrar

Animal No.	Date of Calving	Method of Insemination	Calf No.	Calf Sex	Birth Weight	Remarks

### Breeding Register

Cow No.	Date of calving	First Service			Second Service			Third Service			1 <sup>st</sup> PD	2 <sup>st</sup> PD	Expected date of calving	Origin of Dama	Weight of Calf	Sex of Calf	Number of Calf	Remarks	
		Date	Time	Method	Date	Time	Method	Date	Time	Method									

### Calf Register

Calf number	Date of Birth	Date of Numbering	Sire/Dam	Sex of Calf	Birth Weight	Disposal		Remarks
						How	Date	

### Feeding register

Months \_\_\_\_\_





Date	No. of Animals	Silage/Green Fodder (Kg)			Concentrate (Kg)			Any other Feed Ingredient		
		Received	Issued	Balance	Received	Issued	Balance	Received	Issued	Balance



<b>Self-Check 5</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Time of started: \_\_\_\_\_ time finished: \_\_\_\_\_

*Directions:* Answer all the questions listed below.

1. Explain the organs formed during the embryonic stages of cattle. (4 points)
  
2. Explain the stages of pregnancy in cattle detail (5 points)

**Note: Satisfactory rating - 7 and 8 points**

**Unsatisfactory - below 7 and 8 points**

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

**Answer Sheet**

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Short Answer Questions**



## 5. Waste handling & disposal

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter storm water runoff. The discharge of pollutants to storm water from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on and runoff.

### ***Pollution Prevention***

- ✓ Accomplish reduction in the amount of waste generated using the following source controls:
  - Production planning and sequencing
  - Process or equipment modification
  - Raw material substitution or elimination
  - Loss prevention and housekeeping
  - Waste segregation and separation
  - Close loop recycling
  
- ✓ Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
  
- ✓ Recycle materials whenever possible.
- ✓ Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- ✓ Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- ✓ Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.



- ✓ Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Does not discharge wash water to the street or storm drain.
- ✓ Transfer waste from damaged containers into safe containers.
- ✓ Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.

### ***Waste Collection and management mechanism***

- ✓ Keep waste collection areas clean.
- ✓ Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- ✓ Secure solid waste containers; containers must be closed tightly when not in use.
- ✓ Do not fill waste containers with washout water or any other liquid.
- ✓ Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/hazardous waste collection section below).



<b>Self-Check 5</b>	<b>Written Test</b>
---------------------	---------------------

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Time of started: \_\_\_\_\_ time finished: \_\_\_\_\_

*Directions:* Answer all the questions listed below.

1. Explain the waste reduction mechanism. (4 points)
  
2. Explain Waste Collection and management mechanism (5 points)

**Note: Satisfactory rating - 7 and 8 points**

**Unsatisfactory - below 7 and 8 points**

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

**Answer Sheet**

Score = _____
Rating: _____

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Short Answer Questions**

<i>Operation sheet 1</i>	LO1. Prepare for pregnancy diagnosis procedures
--------------------------	---



<b>Operation Title</b>	Prepare for pregnancy diagnosis procedures.
<b>Purpose</b>	<ul style="list-style-type: none"> <li>▪ To acquaint the trainees with Prepare for pregnancy diagnosis procedures.</li> </ul>
<b>Equipment, tools and materials</b>	This may include boots, hats/hard hat, overalls, gloves, specialized gloves for conducting large animal examinations, relevant breeding records.
<b>Conditions or situation for the operation</b>	<ul style="list-style-type: none"> <li>▪ All the tools and equipment should be ready on time.</li> </ul>
<b>Procedure</b>	<ul style="list-style-type: none"> <li>❖ Wear personal protective equipment while you are Preparing for pregnancy diagnosis procedures</li> <li>❖ Completing preparation for pregnancy diagnosis and Documentation</li> <li>❖ Mustering, Yard and safe restraining of animals</li> <li>❖ Drafting dairy animals to be tested</li> <li>❖ Assembling physical and human resources for pregnancy testing</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>▪ Care should be taken not to be kicked</li> </ul>
<b>Quality criteria</b>	<ul style="list-style-type: none"> <li>▪ Did personal protective equipment worn while Preparing for pregnancy</li> <li>✓ Did materials, tools and equipment used for pregnancy testing are identified ?</li> </ul>



<b>LAP Test</b>	<b>Practical Demonstration</b>
-----------------	--------------------------------

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Time started: \_\_\_\_\_ Time finished: \_\_\_\_\_

**Instructions:** Given necessary templates, tools and materials you are required to perform the following tasks within --- hour.

**Task 1.** Perform pregnancy diagnosis procedure under the supervision of the supervisor.

**Task 2.** Report to supervisor any faulty procedures



## References

- Anatomy and Physiology of Farm Animals . Rowen D. Frandson,W. Lee Wilke  
Anna Dee Falls
- Ashdown, R.R., S.H. Done, and S.W. Barnett. *Color Atlas of Veterinary Anatomy. Vol. 1. The Ruminants.* London/Boston, Mosby-Wolfe, 1996.
- Baumel, J., ed. *Handbook of Avian Anatomy: Nomina Anatomica Avium.* 2nd ed. Cambridge, MA, Nuttall Ornithological Club, 1993.
- Berne, R.M., and M.N. Levy. *Principles of Physiology.* 3rd ed. St. Louis, Mosby, 2000.
- Bertone, J. and C.M. Brown. *The 5-Minute Veterinary Consult—Equine.* Baltimore, Lippincott, Williams & Wilkins, 2001.
- Boron, W.F. and E.L. Boulpaep. *Medical Physiology.* 2nd ed. Philadelphia, W.B. Saunders, 2009.