Artificial Insemination Level-II

Learning Guide

Unit of compétence: Assisting in Performing Pregnancy Diagnosis to Livestock

MODULE TITLE: Assisting in Performing Pregnancy Diagnosis to Livestock

Learning Guide#32

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LGCODE: AGRATI2M090919LO1LG32

TTLM Code: AGR ATI2 TTLM0919v1

LO1- Prepare dairy and equipment for pregnancy diagnosis

Instruction	Learning guide

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

- Prepare dairy and equipment for pregnancy diagnosis
    - Preparing relevant data for pregnancy diagnosis (PD).
    - Prepare and restrain dairy safely in line with enterprise guideline.
    - Assembling the necessary materials and equipment.
- Carry out pregnancy diagnosis
    - Use Personal Protective Equipment (PPE).
    - Identify OHS hazards and implement suitable controls.
    - Carry out pregnancy diagnoses.
    - Identify the stage of pregnancy.
    - Keep and report records.
    - Disposing waste.

Learning Activities

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the "**Information Sheets "1 & 2".**
3. Accomplish the "**Self-check "1**".
4. If you earned a satisfactory evaluation proceed to "Information Sheet **"2".** However, if your rating is unsatisfactory, see your teacher for further instructions. Submit your accomplished Self-check. This will form part of your training portfolio.
5. Read the information written in the "**Information Sheet "2**".
6. Accomplish the "**Self-check "2**".

7. Accomplish all given operation sheet after you get satisfactory point after each self check.

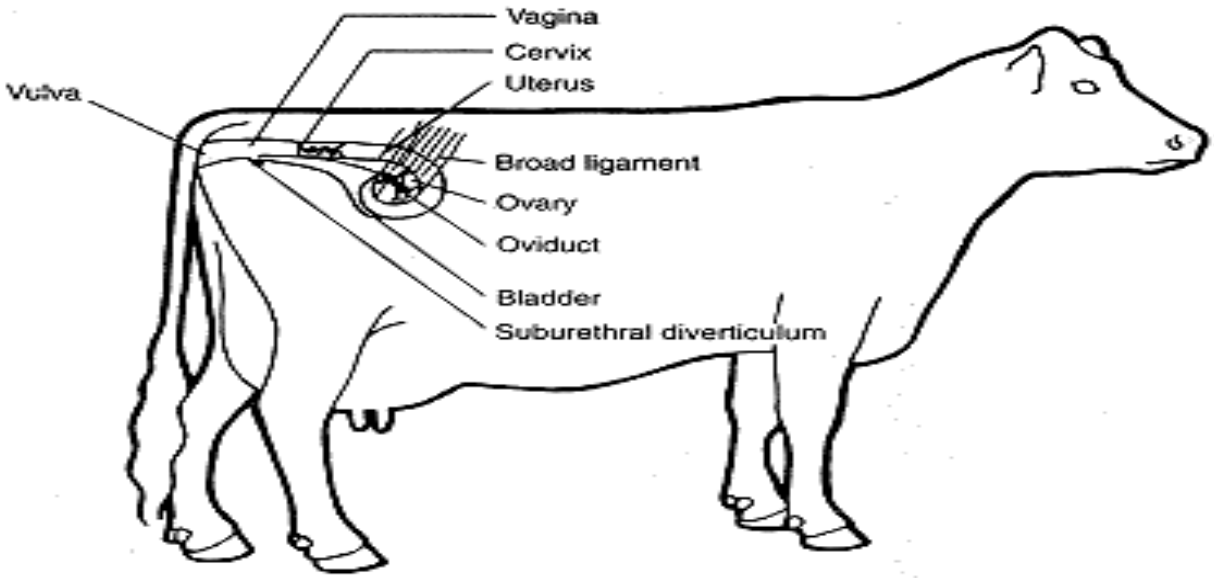
8. Do the “**LAP test**” (if you are ready) and show your output to your teacher. Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory you can proceed to the next Learning Guide.

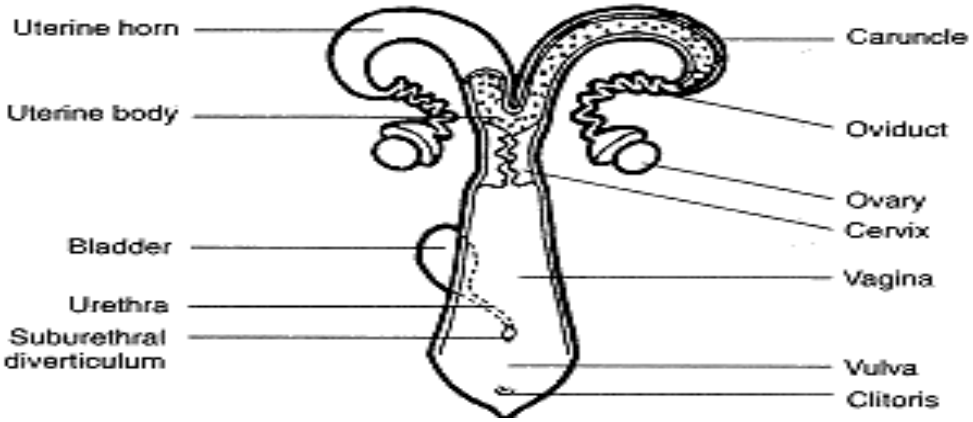
Information sheet 1	Prepare animal and equipment for pregnancy diagnosis

1. introduction

1.1. Female Reproductive system

The female reproductive system, as illustrates for the cow in Figure below, consists of two ovarian and the female duct system. The duct system includes the oviducts, uterus, cervix, vagina, and vulva .The origin of the ovaries is the secondary sex cords of the genital ridge. The genital ridges are first seen in the embryo as a slight thickening near the kidneys. The duct system originates from the *mullerian ducts,* a pair duct which appear during early embryonic development.





Reproductive system and associated parts of the urinary system of the cow as it appears in the natural state (top) and excised (bottom

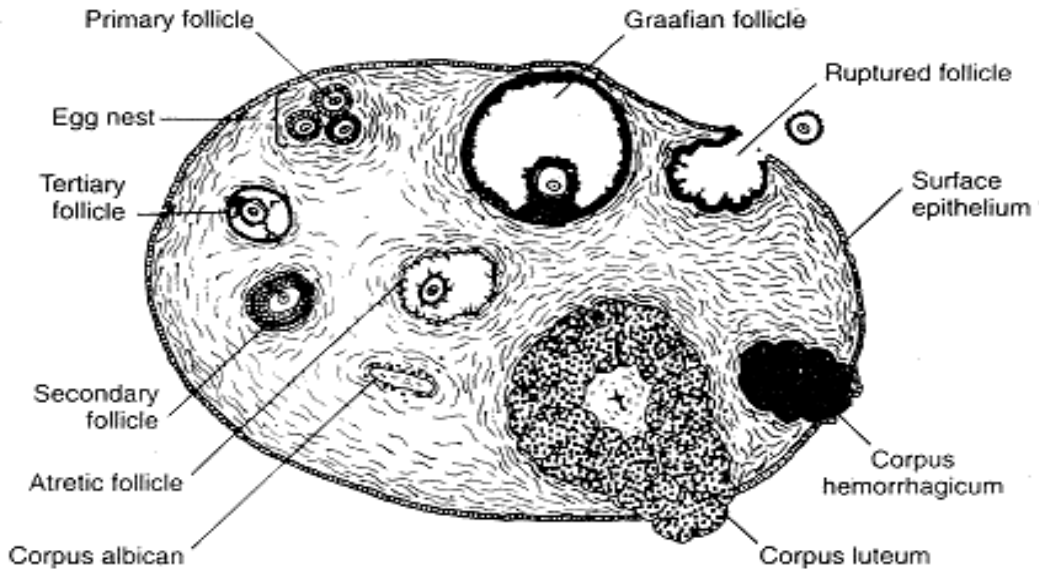
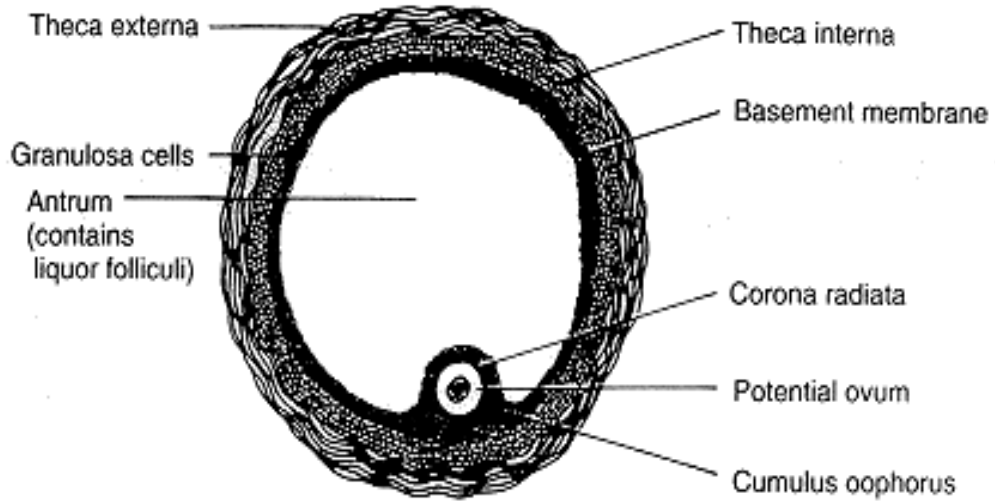


Diagram of structures that can be identified in a cross section of an ovary of a reproductively active female, Different maturation stages for follicles and the corpus luteum can be observed. (Adapted from Patten. 1964



Self check 1	Written test

1. Indicate the reproductive system of female cow using picture (10pt).
2. Write the function of reproductive system (5pt.)

Note you are satisfactory if you score 15 point.

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 7 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	**Relevant data for pregnancy diagnosis**

The documentation prepare for pregnancy testing may include:

- Identification of the estimated stage of pregnancy
- Assembly of relevant breeding records
- Understanding of the composition of the images and an awareness of the possible artifacts which can occur and lead to misdiagnosis
- Key indicators of pregnancy

    - "bounce" (indicating foetal fluid) in one or both uterine horns
    - the presence of cotyledons - size/number/shape (indicating the state of pregnancy)
    - femoral arteries - providing an indication of the stage of foetal development from "pulsing" or "buzzing" and their relative diameter
    - Presence of a developed foetus.

1.2. Preparing and restraining animal

The animal to be examined should be properly restrained.. At many situations when this is not available the hind legs of cows are tied with a rope to avoid kicking and the head is held securely. The tail is held to one side by an assistant. Pressing on the back relaxes the pelvic structures and reduces peristalsis.

1.3. Assembling materials and equipments

The most important materials that used for pregnancy diagnosis include:

- ✓ Stethoscope
- ✓ Thermometer
- ✓ Ultrasonography (optional)
- ✓ Vaginal speculum (optional)
- ✓ Progesterone assay kits

- ✓ Gloves of different size
- ✓ Disinfectants

Self check 2	*Written test*

1. List materials used in pregnancy diagnosis (5pt)
2. Describe indicators of pregnancy (5pt)

   Note you are satisfactory if you score 10pt.

Note: **Satisfactory rating - 7 points** **Unsatisfactory - below 7 points**
You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Artificial Insemination Level-II

Learning Guide#33

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MODULE TITLE: Assisting in Performing Pregnancy Diagnosis to Livestock

LGCOD:AGR ATI2 M09 0919LO2LG33

TTLM Code: AGR ATI2 TTLM 0919v1

LO2: -Carry out pregnancy diagnosis

Information sheet -1-	Carry out pregnancy diagnosis

2.1. **Using Personal protective equipment**

The examiners must wear proper clothing including *boots, hats/hard hat, overalls, gloves,* protective eyewear, hearing protections, respirator or face mask, sun protection (sun hat, sun *screen), and specialised gloves* for conducting large animal examinations. This is essential to protect the examiner from contracting *zoonotic* disease and *spoiling* his clothes. Separate trousers and shirts made of dark colored (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.

2.2. **Occupational health & safety hazards**

What actions could be taken to eliminate or minimise the occupational health and safety risk? All working routines for animals must be carried out in line with the provisions of the Workplace Health and Safety Acts and relevant animal Codes of Welfare. Actions to eliminate or minimise OHS risk should include:

- relevant occupational health and safety hazards identification, risk assessment and risk control measures
- safe operating procedures
- safe manual handling systems and procedures
- safe systems and procedures for outdoor work, including protection from solar radiation
- Selection, use and maintenance of relevant personal protective equipment.

2.3. Carrying out Pregnancy diagnoses

More reliable methods for detecting early pregnancy in cattle are:

- Rectal palpation
- Hormone measurements
- Early Pregnancy-associated Protein
- Ultrasound examination

Non return to oestrus

If oestrus signs are not observed around 3 weeks after service or insemination, the cow is generally assumed to be pregnant. However, even if oestrus detection is good, not all of these cows will be pregnant. On the other hand, up to 7% of pregnant cows will show some signs of oestrus during pregnancy. Insemination of these animals may result in embryonic or foetal death.

Rectal palpation

Advantage: immediate result enabling early treatment of non-pregnant cattle.

Accuracy: depends on the experience of the practitioner and can reach 95%.

Rectal examination is usually carried done between 35 and 65 days post AI.

Early pregnancy diagnosis

(1-3months)

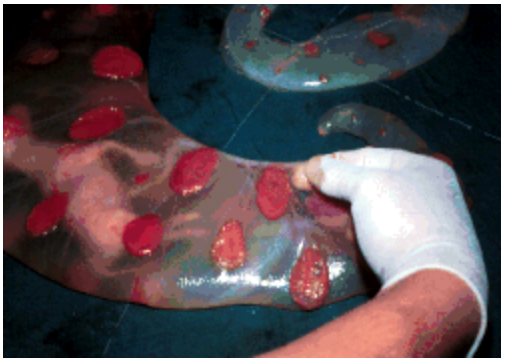
Based on a combination of the following:

- asymmetry of the uterine horns
- decrease in the tone of the pregnant horn
- fluctuant contents in the pregnant horn (later both horns)

- a palpable corpus luteum on the ovary on the same side as the pregnant horn
- membrane slip
- Appreciation of an amniotic vesicle.

Diagnosis in later pregnancy (>3 months)

- cervix is located anterior to the pelvic rim and the uterus cannot be retracted
- uterus is flaccid
- placentomes, and sometimes the foetus, are palpable
- The median uterine artery increases in diameter and fremitus can be detected.



Technique of pregnancy diagnosis by rectal palpation of a retractable uterus

Common reasons for errors in rectal palpation

- failure to retract the uterus
- abnormal uterine contents (pyometra or mucometra)
- incorrect service dates

Safety

Rectal palpation is widely used and considered a safe method for pregnancy diagnosis in cattle. Nonetheless early or inappropriate palpation of the amniotic vesicle may damage the embryo and cause embryonic mortality.

Hormone measurement

Progesterone assay

The progesterone secreted by a functional corpus luteum between 18 and 24 days after service or insemination is an early indication of pregnancy. It can be assayed in milk or plasma. Optimal assay time is 24 days after service or AI; this eliminates the possibility of long oestrus intervals which might result in false positives.

Accuracy

The sensitivity (i.e. accuracy in detecting pregnancy) of the cow-side milk progesterone (EIA) test was 93.1% in a study by Pieterse et al. (1989). However, specificity (i.e. accuracy in detecting non-pregnancy) was only 39.3%. A large number of non pregnant may thus be diagnosed as pregnant.

Common reasons for errors in hormone measurements

- pyometra/persistent corpus luteum
- short oestrus intervals
- cystic ovarian disease (luteal cysts)
- incorrect handling of the samples and test kit

Early pregnancy associated protein

Recently available tests detect so called early conception factor (ECF) or pregnancy-associated glycoprotein in blood samples. They are reported to detect the pregnancy-associated glycoprotein within 48 hours of conception.

Because of the high incidence of embryonic mortality this test should be treated solely as an indication of conception. Pregnancy should be confirmed later by rectal or ultrasound examination.

Ultrasound examination

 Pregnancy examination using ultrasound

 Examples of ultrasound images during pregnancy

Early identification of non-pregnant cows post breeding improves reproductive efficiency and pregnancy rate in cattle by decreasing the interval between AI services and increasing AI service rate.

Real time (B-mode) ultrasound is a reliable and relatively simple method of diagnosing pregnancy as early as day 26.

Accuracy

An accuracy of over 99% can be achieved, enabling fertility problems to be identified rapidly.

Two factors affect the speed at which ultrasound examinations can be conducted on a dairy farm:

1. Operator proficiency and availability
2. Restraint of animals

When both factors are optimised, the speed of ultrasonography can approach that of rectal palpation, while exceeding palpation in the amount of information gathered from each animal. The main advantage of scanning is that it can give an accurate diagnosis earlier than rectal palpation.

2.4. Identifying stage of pregnancy

You may need to stage pregnancy if records are not kept or a bull runs with the herd. You may need to confirm AI dates, or an AI date may not match what you feel. You may be asked to estimate parturition dates for beef herds.

Estimation of stage of pregnancy by rectal palpation

Technique:

Fluid is barely palpable at 28 days, although this is not a positive sign of pregnancy.

Amniotic Vesicle (this is not recommend for student palpation)

The AV can be palpated as long as 2 weeks after is crushed. This would be a case where you find a positive sign of pregnancy, but the cow is not pregnant.

Cotyledons (actually the place tome, which is the cotyledon/caruncle unit), you must rule out that you a re palpating an ovary by feeling at least 3. At 75 days it reach pea size.

2.5. Keeping and reporting records

The most important information might be recorded and reported includes: Dates, times and periods of observations, chemicals and other substances used, including quantities and methods, and readings from temperature gauges.

Disposing waste

Waste may include but not limited to: Packing materials, plastic materials (gloves, sheath, and syringe) and chemicals and or reagents used. All these and others must dispose buried and incinerate in a given area.

Self check 3	*Written test*

1. List pregnancy diagnosis methods (6pt)
2. How can you detect pregnancy by means of ultrasound examination(5pt)
3. Write methods that enables you to estimate stage of pregnancy(4pt)

You are satisfactory if you score 15pt.

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 7 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	***Pregnancy diagnosis by rectal palpation***

Procedures

1. Put on PPE
2. Assemble necessary materials
3. Present the animal to be examined
4. Restrain the animal
5. Wear gloves
6. Remove manure from the rectum
7. Retract the uterine and cervix
8. Try to palpate the foetus in the uterus based on key indicators of pregnancy
9. Keep and report record

operation sheet 2	***Pregnancy diagnosis by ultrasound***

Procedures

1. Put on PPE
2. Assemble materials used for examination
3. Restrain the animal
4. Insert the probe in the rectum of cow/heifers
5. strategically position it above the uterus

Reference

Functionally important features of a Graafian follicle, (Redrawn from Hafez.1974. *Reproduction in Farm Animals*.(3rd ed.) Lea and Febiger.)