**Examination of Cervico­ Vaginal Mucus Sample**

Examination of cervico-vaginal mucus sample help in the assessment of physio-pathological condition of female genital organs.

1. Colour
	* Transparent- Normal (in oestrus period).
	* Scanty reddish colour discharge - Metoestrus phase
	* Opaque or transparent with flakes - Mild infection
	* White or yellow colour- Metritis/ pyometra
2. Consistency
	* Thin watery- Early oestrus
	* Viscous and ropy- Mid heat
	* Thick - Late heat
3. Odour - Normally, genital discharge is odourless. However, foul smelling odour generally indicates severe metritis with systemic involvement with possible retention of foetal membrane or some foetal parts in the uterus. It is usually found in case of post- parturient disorder.
4. pH : The pH of genital discharge can be recorded by an ordinary pH indicator paper or using pH meter. The normal pH of genital discharge ranges from 6.5 to 7.4. A higher pH indicates presence of infection.
5. White side test:
	* Take 1ml. cervical mucus in a sterilized test tube.
	* Add 1 ml 5% sodium hydroxide solution to it.
	* Heat the mixture upto its boiling point.

Interpretation :

* + Dark yellow colour - Clinical metritis
	+ Yellow colour - Subclinical metritis
	+ No colour- Normal
1. Microbiological examination :The discharge is sent for isolation and identification of organisms and for antibiotic sensitivity test.

Observations :

• Case No ................... .

• Species .................... .

• Breed .......................

Physical examination :

• Colour .................. .

Date : ..................

• Consistency ........................................... .

* + Nature (serousfmucusfmuco-purulent) ........... .
	+ Presence of blood *Yes/No*

• Odour .................................................. .

• pH ...................................................... .

Microscopic examination

* Fern pattern *Present/Absent*
* RBC *Present/Absent*

*Typical/Atypical*

* + Protozoa *Present/Absent* if present, species ......... White side te t (Colour) ..........................

Bacteriological examination.

Micro organism (s) ................................... .

Most sensitive drug ............................. . Diagnosis

Treatment

Rx

1.

2.

3.

**EXERCISE:**

1. What is the importance of White side test?

*Ans.*

1. pH of vaginal discharge increases during infection. Give reason.

*Ans.*

1. What is metoestrus bleeding?

*Ans.*

1. What is pro-oestrus bleeding ?

*Ans.*

**Technique of Intra-uterine Therapy**

Objective:

To introduce the drugs into the uterus to overcome the infection in various disease conditions.

Materials Required :

Obel's apparatus, catheter, syringe, cotton, saline, pipettes, etc.

Procedure:

1. Clean vulva and perineal region with the dry cotton.
2. Insert the left hand in the rectum and remove the faecal material by back racking.
3. Spread vulva apart and insert the instrument (catheter or Obel's apparatus) up to fornix.
4. Hold the cervix between two fingers through rectal wall and keep thumb on the external os.
5. The catheter is initially inserted pointing upwards at an angle of about 30° to avoid entering into the external urethral opening and is then moved horizontally until it is engaged in the external os of the cervix.
6. Entry into the external os is accompanied by a characteristic +'gritty' sensation.
7. Thereafter, introduce the catheter through convoluted cervical canal by manipulation of the cervix through rectal wall.
8. Place one finger over the internal os of the cervix, so that the tip of the catheter can be palpated when it passes the cervical canal.
9. As soon as, the catheter is passed, the drug should be pushed through syringe into the body of uterus not in uterine horn.
10. In this way, drug is equally distributed between the two uterine horns.
11. The recto-vaginal method of intrauterine medication requires

considerable practice for success.

1. Obstruction in passing catheter by vaginal folds can be minimized by pushing the cervix forward. By doing this, vaginal passage becomes unfolded.
2. After passing catheter in the cervix, no forward pressure sho.uld be exerted on the catheter with the right hand because uterine wall is friable and easily penetrated if the catheter moves suddenly.
3. The most common fault during intra uterine therapy is twisting of cervix in the left hand which occuludes uterine horns.
4. The irritant solutions or antibiotics, such as Lugol's iodine, tetracycline, etc., when given intrauterine, affects the length of oestrous cycle.
5. The irritant intrauterine infusions given during days 3 to 9 of the cycle (oestrus day 0) may significantly shorten the time for the female to return in oestrus.
6. The infusions at oestrus or mid-diestrus does not affect oestrous cycle length.
7. The infusions on days 14 to 17of the cycle (oestrus day 0) prolong the luteal eriod or oestrous c de len th.

Observations :

Date: ....................

* + Case No.
	+ Species
	+ Age of animal
	+ History of animal

• Problems of animal .............................. 00 00 ...............

• Drug chosen for IU ............... ..... 00 ....00 .......00 ...00 ......

EXERCISE :

1. Write the commonly used intrauterine drugs, their indications

and doses?*Ans.*

2.Intrauterine therapy is contraindicated in case of acute puerperal metritis. Give reason.

*Ans.*

3.Why the DIS (dilute iodine solution) does not affect the oestrous cycle length when given intrauterine during oestrus and mid­ diestrus?

*Ans.*

4.How does the DIS shorten the length of oestrous cycle when given intrauterine during days 3 to 9 of the cycle?

Ans.

5.How does the DIS lengthen the length of oestrous cycle when it is given intrauterine during days 14 to 17 of the cycle?

*Ans.*

**Oestrus Detection In Cattle And Buffalo**

 **Objective**:

To know different methods used for detection of oestrus which is essential for artificial insemination at proper time for optimum conception rate.

**Materials Required** :

Teaser, trained dogs, glass slide, a pair scissors, arm-sleeves, gumboots, soap, towel etc.

**Different Methods** :

By behavioural signs:

* + Restlessness
	+ Bellowing frequently
	+ Spontaneous sinking of the loin
	+ Reduced appetite
	+ Fall in milk yield
	+ Frequent micturition (few drops of urine every 3-5 minutes)
	+ Mounting on the other animals (early heat)
	+ Accept mounting by other animals (mid heat)
	+ Mucus discharge flows as a string from vulva to the floor and breaks (early heat)
	+ Mucus discharge hangs from the vulva to hock and then breaks off (mid heat)
	+ The mucus string hangs only 25 to 30 em long (late heat)
	+ Loin reflex or Tolerance reflex: When the skin of lumbar and sacral vertebral region is held, all the animals will sink their back, but the animal in oestrus raises its tail to one

side of the vulvar lips in addition to sinking its back. This is called loin reflex. If the animal is not in heat, it raises the tail above vulvar lips, not one side of the vulvar lips .

* + In buffaloes, the skin is kneaded from lumbar region to the base of the tail repeatedly without lapse of time between kneadings and if she is in heat, raises the tail to one side of the vulvar lips. This is called "Tail Reflex".
	+ Clitoris massage reflex: When ventral vulvar lips are massaged gently, the animal in heat bends and raises its back repeatedly simultaneously contracts the abdomen with raising the tail to one side of the vulval lips.

**Note: Most of the buffaloes get excited on this test. Hence this test should not be performed for the detection of oestrus in buffaloes.**

**important point**

The external signs of oestrus which are mentioned above, not necessarily each and every cow show all signs simultaneously. Hence, for confirmation, more or less apparent external signs necessitate to check the genital system by rectal examination and vaginal examination.

Early oestrus - Clear, thin and copious, flows stringy from vulva to the ground

Mid oestrus - Clear, less copious and stringy, hangs upto hocks Late oestrus - Clear, thick, scanty and non sticky

After ovulation- Yellowish white

Metoestrus------Sanguinous because of presence of blood

* By per-rectal examination :

Following changes are found in the oestrus cow/buffalo

Cervix -Relaxed so that the tip of thumb can be inserted into os

* -Tonicity of uterus -- Tonic & turgid
* Tubularity of uterine horn------- Round or flat
* Consistency of uterine horn---- Meaty
* Mature Graafian follicle-----Bulged & Firm - Early heat Moderately flat and soft­

Mid heat

Soft - late heat

* + No evidence of mature corpus luteum
* By vaginal examination :
* Vulval oedema and disappearance of wrinkles.
* Entire part of vulval lips light pink Early heat
* Entire vulval lips dark pink Mid heat
* Entire vulval lips cyanotic Late heat
* By laboratory diagnosis :

Laboratory diagnosis of oestrus requires expensive equipments, the procedure is time consuming and it does not give a clear-cut result in every case. Therefore such methods are unsuitable for routine use. The only laboratory method suitable for use in cattle practice is measurement of the electrical resistance of vaginal mucus. Values less than 40 ohms are characteristics of oestrus.

* By a teaser **bull:**
	+ In a large farm, use of teaser bull for detection of heat is the most reliable and successful method.
	+ Parading the teaser bull twice daily in the herd.
* By a trained dog :

Some pheromones are used to communicate information concerned with reproduction called sex pheromones. The external genitalia and urine contain these pheromones. When a dog is trained with cow's vaginal fluid, then the dog can detect oestrus cow (87% accuracy). This inter-species detection of pheromones helps in identifying oestrus in a herd where artificial insemination is to be used.

Detection Of Split Oestrus :

In split oestrus, the animal show behavioural oestrus twice within a period of 3 to 6 days. The first oestrus is generally non-ovulatory while the second oestrus is ovulatory. It is common in winter.

Detection Of Mid-Cycle Oestrus :

Animals having large follicle and regressed CL on either ovary are considered standing oestrus while those having fully developed CL co-existing with palpable ovarian follicle (10 mm. in diameter) and showing heat symptoms are considered or diagnosed as mid-cycle oestrus.

Temporary Engorgement of Teat (TET) :

TET has relationship with occurrence of oestrus in buffaloes. It is a peculiar phenomenon exhibited by majority of the buffaloes prior to the onset of real heat. The proestrus behaviour is used by most animal owners as an important tool for detection of incoming oestrous. Duration of TET phenomenon is of 3 days.

* By fern pattern of cervical mucus :

Principle :Sodium and potassium ions / colloids in the mucus when dried, take the shape of fern leaf at high oestrogen levels.

Procedue:

* + Take a 18" long glass tube attached to a syringe or use AI gun and disposal sheath.
	+ Pass it in the cervix and aspirate the mucus and collect in a test tube (or cut a piece of hanging cervical mucus from the vulva with a pair of scissors.)
	+ Take a drop of cervical mucus on a glass slide and spread it

evenly.

* Dry it in air or gently warm over the flame.
* Examine the slide under low power (10 X) microscope and note the crystallization pattern.
* Characteristic fern-like patterns (crystallization pattern) are visible under the microscope. Different fern patterns are exhibited at different stages of oestrus.
* These patterns are absent in the mucus drawn during luteal phase and from pregnant animals.
* However, pregnant animals which exhibit symptoms of oestrus,

show crystallization pattern in cervical mucus.

* The fern pattern can be classified into three types
	+ Typical - Clear fern leaf-like appearance. The branches are well marked and have bright and thick boundaries ..
	+ Atypical - Mixed type appearance. Fern branches remain

discontinous and are not well cut out into further branching.

* + Nil type - No fern like appearance.

Interpretation :

* + Early heat : Fern patterns are scattered and are small in

size. Branching is thin and fine.

* + *Mid* heat :Arborization or crystallization is visible through out the smear. The branches are well marked and have bright and thick boundaries. Tertiary to quaternary or quinquinial branching is observed. This type of pattern is generally referred as "typical".
	+ Late heat :Crystallization is not typical. Fern branches are discontinuous and not well cut out into further branchings. There is an increased infiltration of lymphocytes in the smear also.
* In some animals cervical secretion shows fern like pattern even from few days before the actual oestrus to some days after its end. Animals with weaker oestrogenic activity may have thin, scattered and irregular types of crystallization pattern in their cervical mucus.
* There is no vulvar wrinkle in buffaloes as in cow.
* During oestrus in buffaloes, discharge is thin and not copious as

in cow.

* Pregnant animals can expel mucus discharge, but it will be more thick, may be moderately cloudy and its tip will be like a 'club'.

**Clinical Correlation**

* Interval between two heats is 7-8 days -Acute

endometritis

* Interval between two heats is 10-11 days - Mid cycle heat
* Interval between two heats is 13-17 days - Endometritis
	+ Interval between two heats is 23 to 37 - 45 days - Embryonic

death

* + Interval between two heats is 42-45 days - Missed heat or

silent heat

* Interval between two heats is 2-3 days - Split heat
	+ Interval between two heats is 4 to 8 days - Follicular cyst

s continuous!

In non-pregnant large domestic animals, inflammation of the endometrium due to bacterial infection can result in significant synthesis and release of PGF2u leading to premature luteolysis and shortening of the oestrous cycle. Thus short oestrous cycle in large domestic animals are pathognomonic sign for uterine infection.

Observations :

* Case No.
* Age of animal

Date ....................

• Signs of heat ..............., ..............., ................, ............... .

• Loin reflex (present/ absent) ............................................ .

* + Clitoris massage reflex (present/ absent) ............................. ..
	+ Tail reflex *present/absent*

• Nature of vaginal discharge ................................... .

• Length of vaginal discharge ................................... .

• Fern pattern ..................................................... .

* + Colour of vaginal mucus membrane .......................
	+ Finding of per-rectal examination.

Cervix ...................... .

Uterus ...................... .

Ovary ...................... .

* Diagnosis

Exercise:

1. What do you understand by 'loin reflex', 'tail reflex' and 'clitoris massage reflex' ?

Ans.

1. How can a trained dog detect heat in cows ?

*Ans.*

1. How will you diagnose 'mid-cycle heat' by per-rectal examination?

*Ans.*

1. What do you understand by TET?

*Ans.*

1. Why cervical mucus of oestrus cow get crystallized ?

*Ans.*

1. What are the differences between 'typical' and 'atypical' fern pattern?

*Ans.*

1. What are the different methods of preparation of teaser bull ?

*Ans.*