

Repeat Breeding in cattle and buffalo: New concepts in diagnosis and therapy



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- Artificial insemination services are provided in India through 71,341 AI stations clocking 52 million inseminations with overall conception rate of 35% in bovine and buffalo population (Singh and Balhara 2016)

A manifestation by the animal due to multifactorial etiology

Global Problem

Modern day high producing Holstein cows due to intensive selection for high yields have reduced fertility (Dobson et al.,2007)

Incidence : 06 to 35 %

2nd most common reproductive disorder

More common in cows vs buffaloes

ETIOLOGY Failure of Fertilization & EED

Predisposing Factors

Nutrition

Negative energy balance

High Protein changes uterine pH & decrease P4

Micronutrients Deficiency Ca, P, Mg, Cu, Zn, Vit A, E, Se

Endocrine dysfunction(suprabasal P4)

Infection/reproductive tract abnormality

Poor semen quality

Age

Genetic

Immunologic Antisperm antibody

Peri-Parturient disease

Stress Heat most important

Services required per conception is the standard for assessment of the problem

- At conception rates of 70, 60, and 50 percent 2.7, 6.4 and 13.0% of healthy cows require 4 services to conceive.
- Low conception rates could be because of sub-optimal semen quality, faulty AI, poor hygiene and with poor CR the number of services required may further increase hence it remains difficult to define the repeat breeding problem for individual cows however, in herds-----

Diagnostic Methods

- Record Analysis
- Visual
 - Proper estrus detection
 - Proper mating events
 - Colour, consistency of cervico-vaginal mucus

Vaginoscopic examination to exclude growths, adhesions

Uro-vagina uncommon can spoil semen



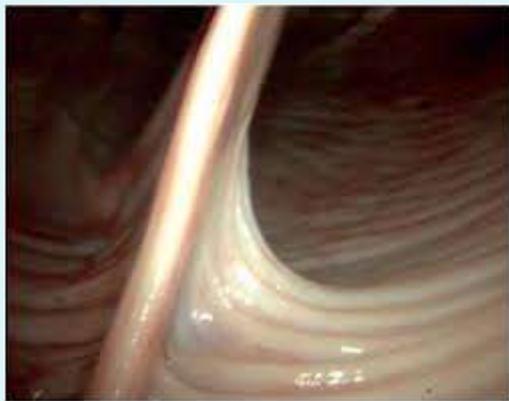
Transrectal palpation

- Uterine tone at AI- subjective
- Follicle at AI
- Ovulation depression
- Early CL day 5 Sub-optimal
- Early Embryonic deaths
Not possible to be detected as most deaths occur before day 20



Vaginoscopy

- Helpful in detecting scars, adhesions, growths and the cervical condition.
- Metricheck helpful in detecting vaginal secretions



Tests to evaluate uterine health

- Uterine pH Catheter electrode inserted into the uterus or pH of CVM
Normal pH 7.3
6.9 and 8.0 suggest
endometritis

White side test to detect metritis

Cervical mucus + NaOH Boil

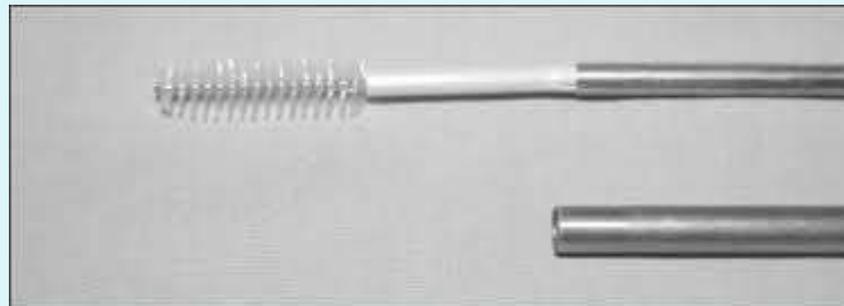
Yellow colour indicates metritis

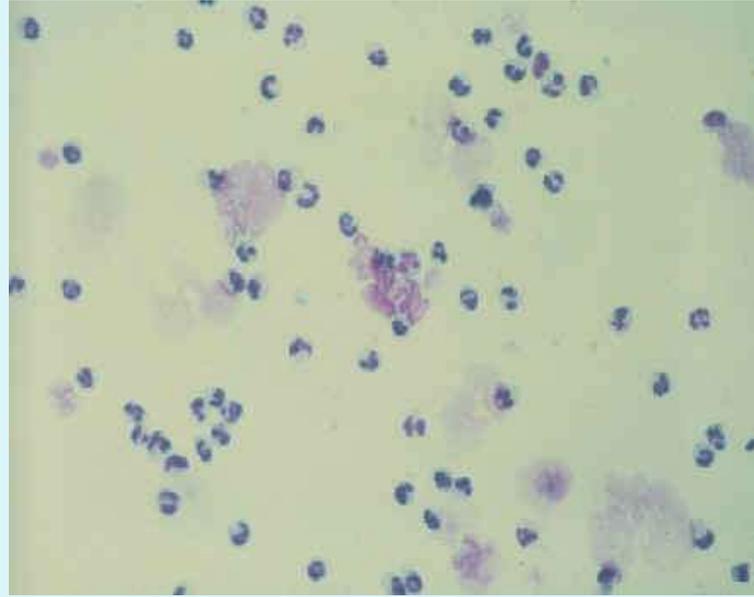
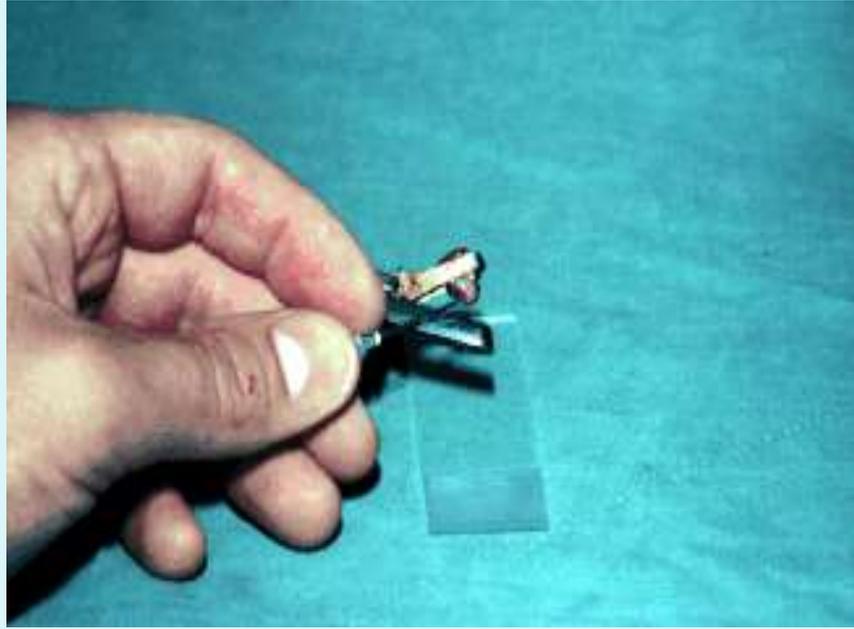
Uterine Microbiology



Uterine biopsy and cytology

- Biopsies must be reserved for growths only
- Uterine cytology performed using cytobrush or low volume flush can be useful for evaluating herd uterine health
- PMNs in cytology samples would depend on the days post partum
- 5% PMNs are considered for repeat breeding cows with sub-clinical endometritis

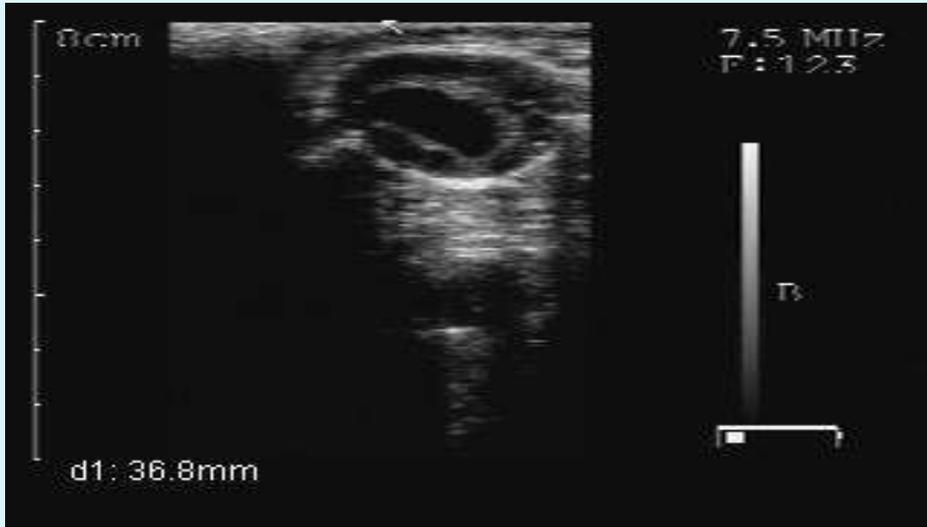




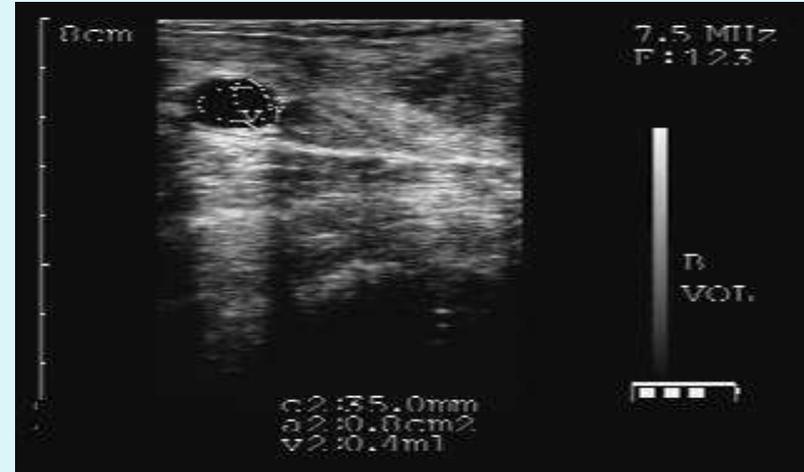
In Vivo imaging techniques



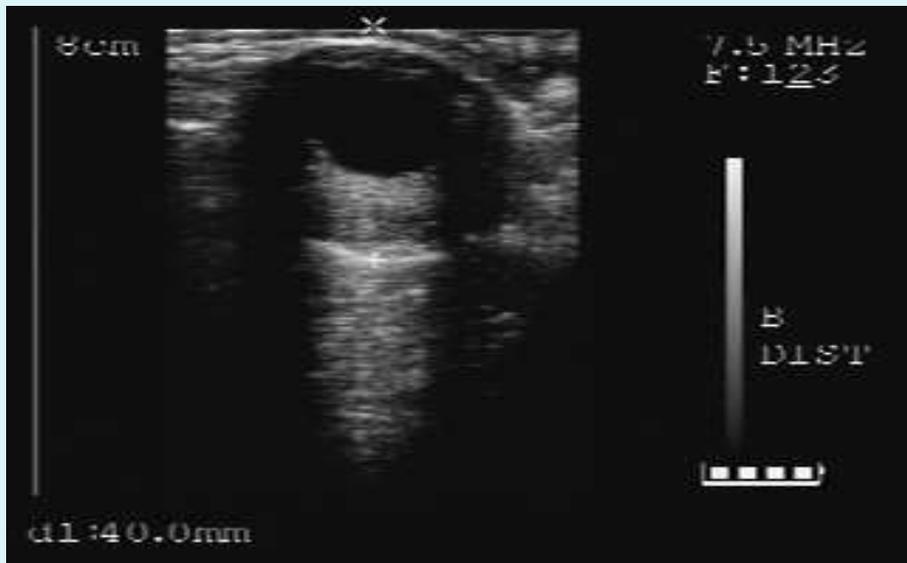
Ultrasonography



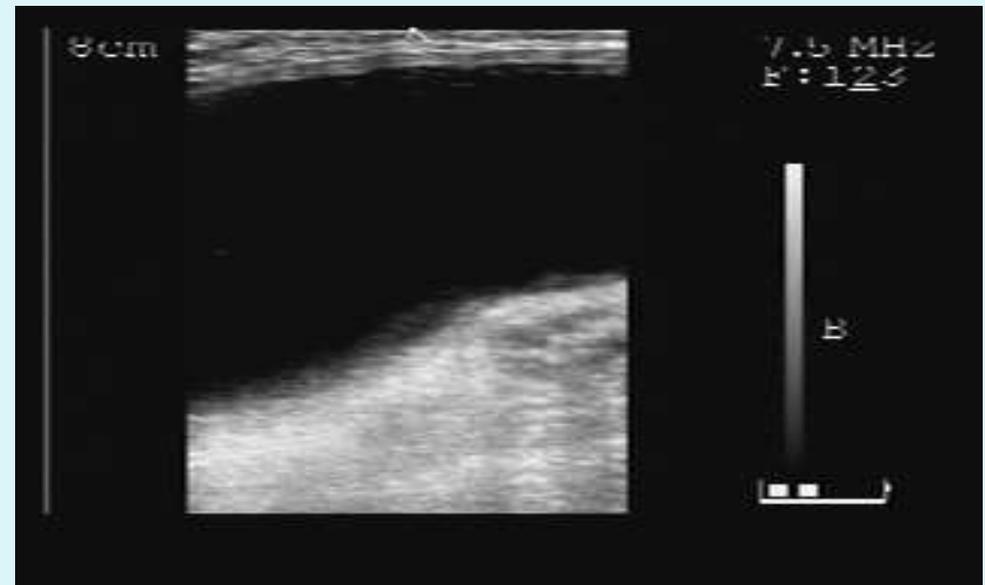
Luteal ovarian cyst



■ Uterine fluid accumulation



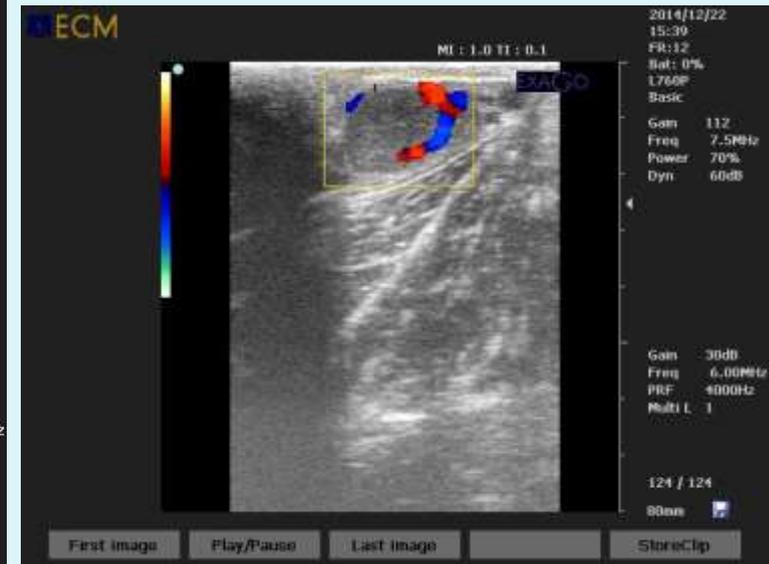
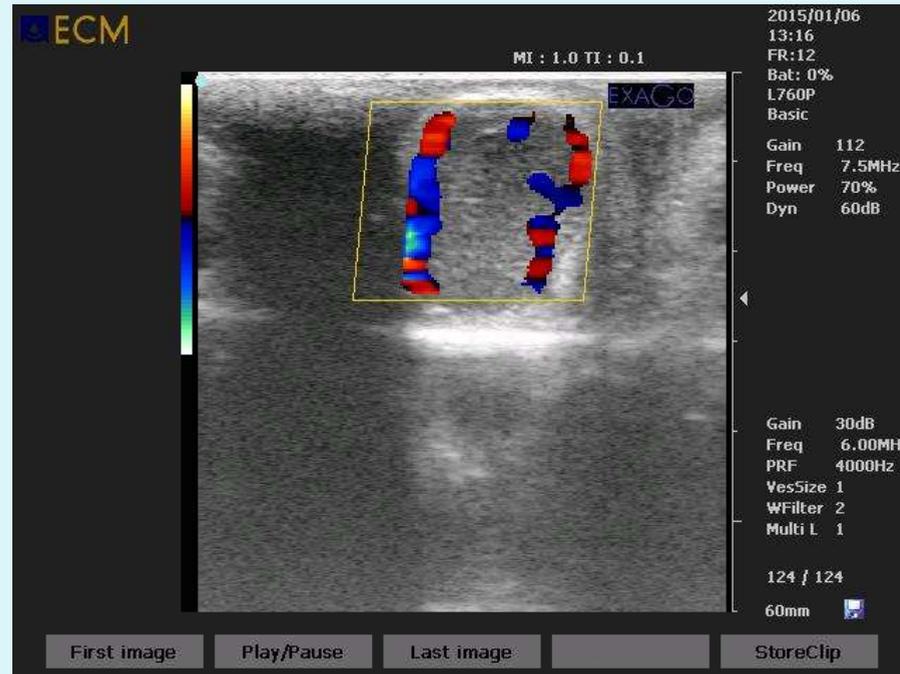
■ Follicular ovarian cyst



• Mucometra

Colour doppler

- Determines echogenecity and blood flow and hence can determine physiological status of follicles/ CL etc.



Magnetic Resonance Imaging Prototypes for Transrectal imaging under development



Magnetic resonance imaging is based upon relaxation of hydrogen protons in a large magnetic field after a radio-frequency pulse (RF) has deflected the proton spin transversely.



- Three dimensional images can predict ability of follicles to produce steroid and ovulate and hence can predict the exact physiology

CT Scan (Computer assisted tomography)

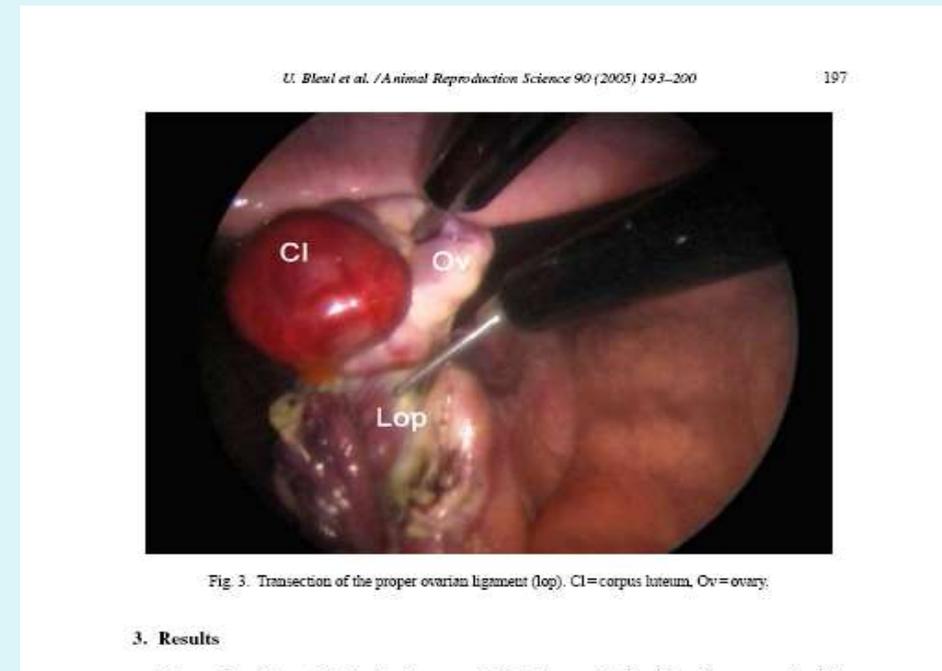
- Uses X-Rays for diagnostic purposes

Only in the developmental stage in veterinary medicine



Hysteroscopy / Laparoscopy

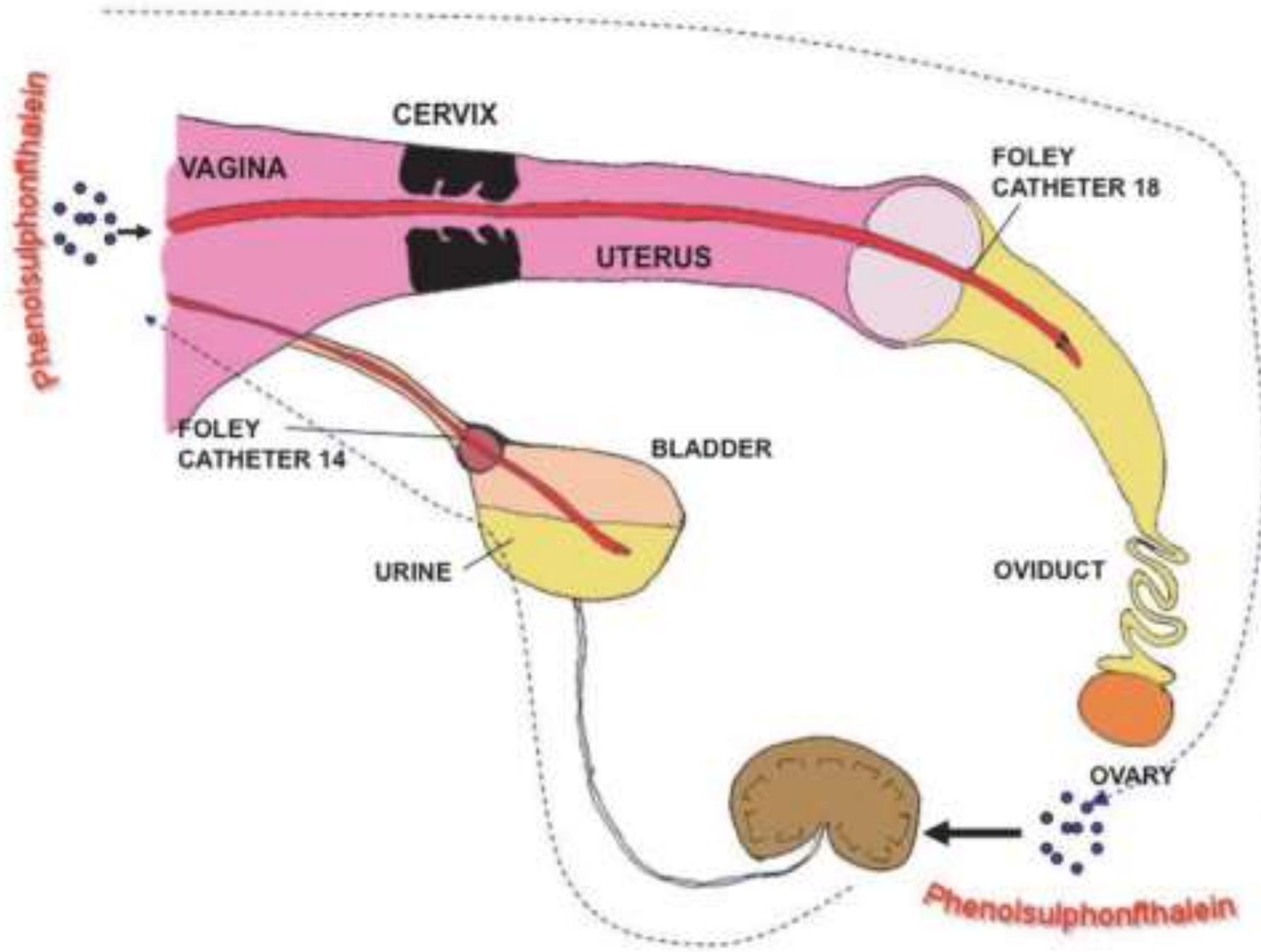
- Evaluates morphology of live tissues
- Received little attention in bovine because of the cervix
- Flexible hysteroscopes more common





Tubal Patency testing

- phenol-sulphon-phthalein (PSP) test Urine color changes within 30-45 min of infusion of dye in the uterine horn by a catheter
- A recent study found 44 of the 50 cows evaluated to have some degree of oviductal obstruction
- Contrast Sonography



Hormone Assays

- RIA
- ELISA
- ECLIA



Immunosorbent assay

Progesterone assay

LH



Diagnosis of herd problem can be attempted but the diagnosis of cause of repeat breeding in an individual animal is extremely difficult

Therapy

Evaluate semen

Evaluate cows for anatomic defects

Evaluate for nutrition and management and advice appropriate measures of correction

Evaluate reproductive hygiene and insemination procedures and adopt corrective measures



- **Herd**

- Correct deficiencies

- Treat Bulls for minor problems

- Change Bulls or evaluate semen

- Vaccinate for infectious disease

Individual animal

- Combating Uterine Infection

- Monitoring for Ovulation/Cysts

- Therapy of luteal insufficiency

- Improving AI techniques

- Improving management



Specific corrective measures

- Genital tract infection

Intrauterine/parental antibiotics

Prostaglandins

Immunomodulators

Oyster glycogen 500 mg in 50 mL PBS I/Ut.

LPS 100 µg in 30 mL PBS I/Ut

Intrauterine infusion of autologous or heterologous serum

Agents to alter Uterine environment

Antioxidants: 4mM Taurine + 50 mM fructose in
PBS before AI

Vitamin C Inj Ascovet 20 mL before AI

Enzymes: Trypsin, Chymotrypsin, papain I/Ut.

Acetylcysteine 600 mg in 50 ml of distilled water intra-uterine

Uterine motility stimulants

Mifepristone, clitoral massage

Hormonal therapy

- Correction of Ovarian dysfunction

Delayed ovulation

hCG Injection Pubergen/Chorulon 1500-3000 IU at AI

GnRH 100 µg IM at AI

PG at AI

Antiprolactin Bromocryptine 10 mg orally 12 h before and at AI

Dextrose 500mL IV at AI plus Bovine insulin 0.2 IU/Kg IV

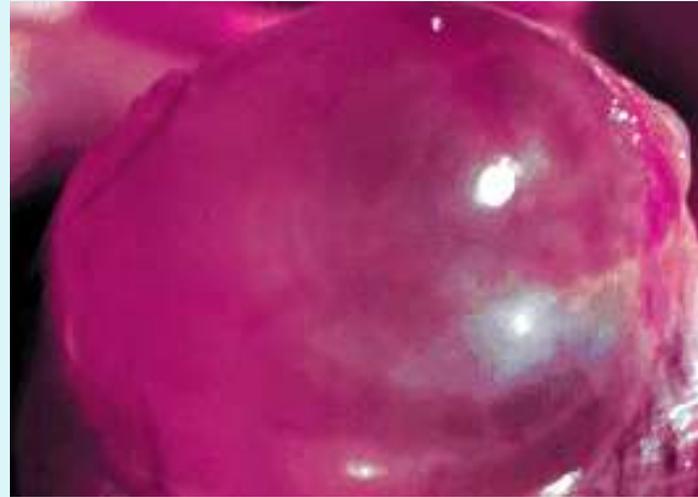
Clomiphene 300 mg orally

Metformin 2000-4000 mg orally



Ovarian Cysts

Single IM injection of Progesterone
Vaginal progesterone implants
100 U_g GnRH
Ovsynch protocol
PG + GnRH (day 0) + PG (day 14)
Transvaginal US guided aspiration



Mucometra

Pott iodide 10-15 gm daily with feed for 5-7 days
Ifer-H 2 mL SC



Luteal Insufficiency

hCG injection at 4-5 days of AI

Progesterone injection 500 mg at 5 days of AI

Progesterone vaginal implants.

Recombinant Bovine Somatotropin 500 mg SC at AI

Antiestrogens Tamoxifen citrate ??

GnRH at AI and at day 14-16

Bovine insulin on day 8,9 and 10 of estrus

Letrozole administered IM (1mg/kg in oil) on Day 3 of ovulation

Feeding of fish oil/Linseed oil

Nutritional Management

- Management of dry cows important
- Advice not to feed more than 10% of rumen degradable proteins
- Dry cows should be fed low energy high fiber diet with more of chopped straw
- Feeding of anionic salts with Ca and P
- Injections of vitamin A, E and C important



Timing of AI/ Semen deposition

- Multiple AI in long estrus periods
- Training of AI Personnel
- Deep Intrauterine AI

Avoiding Periparturient disorders

Metabolic diseases Ketosis/milk fever

Parturient problems

Immuno-infertility

More anecdotal

Give vitamin C, E and dexamethosne

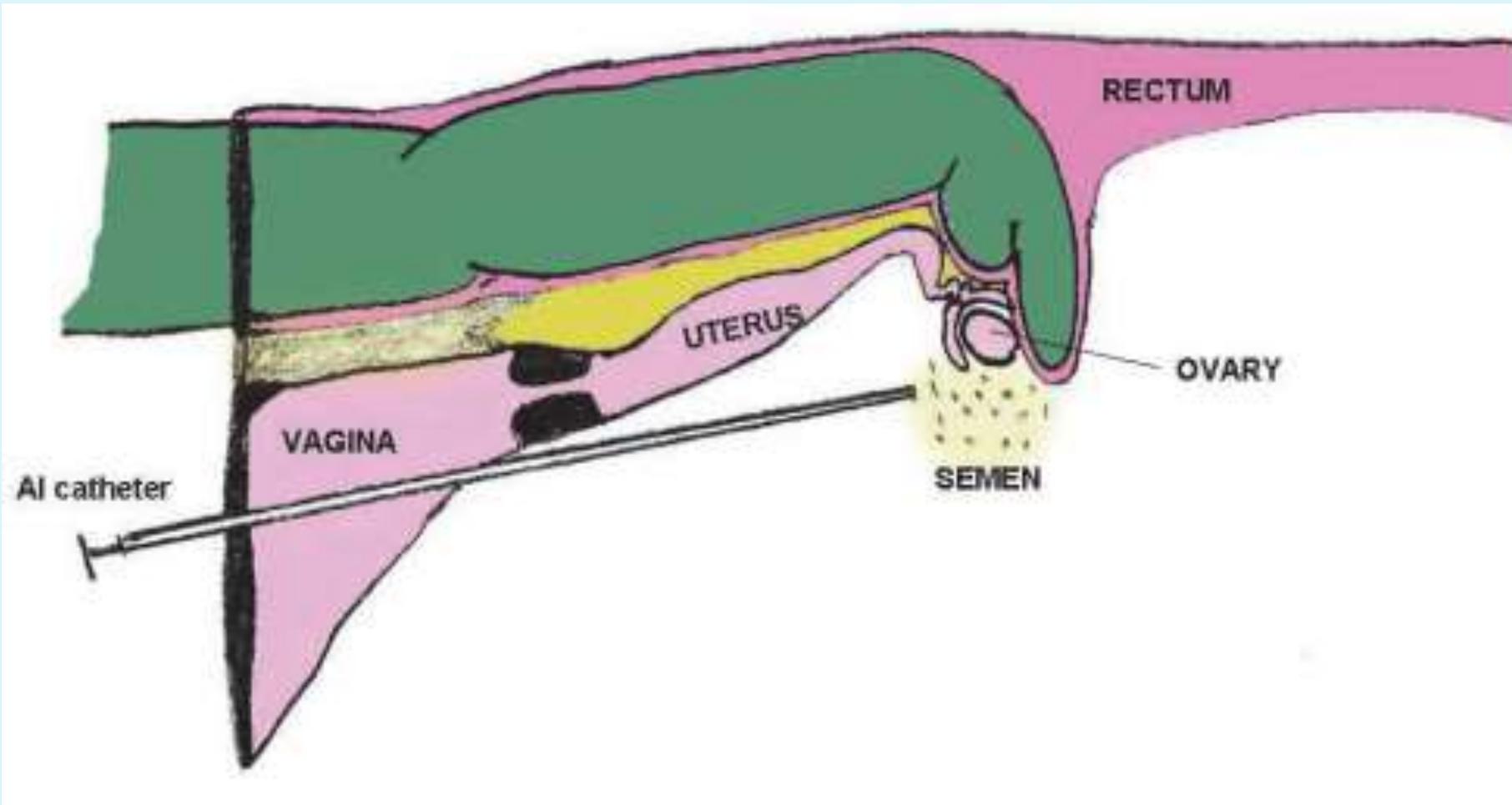
Change the bull or semen

Other therapies

Acupuncture and Intraperitoneal AI or embryo transfer.

- Repeated inseminations
- Mineral vitamin supplements
- Cooling of heat stressed cows/ buffaloes
- Adequate hygiene at parturition & at AI
- Regular and frequent check of semen
- Addition of sperm motility enhancers when liquid semen is used eg. caffeine
- Prevention of natural mating with scrub bulls

DIPI



Repeat breeder cow/buffalo

Exclude effects of season

Herd

Individual

Female

Male

AI

Natural mating

Investigate and advise

1. Nutrition (preparturient)
2. Collect samples for investigation of infectious disease
3. Reduce stress
4. Metabolic profiles

1. Evaluate semen and AI techniques

1. Infectious disease
 - (i) Trichomonas
 - (ii) Campylobacter
2. Semen evaluation
3. Age of bull

1. Investigate for abnormalities of genital organs like ovaro-bursal adhesions, cystic ovaries, tumours, stenosis, etc.
2. Investigate for subclinical endometritis. When no tests possible, treat onf presumptions if there is a history of periparturient disease.
3. Monitor ovulations/oestrus cycle length
 - (i) Provide ovulation induction treatments at AI
 - (ii) Repeat AI/consider I/U AI
4. If animals do not settle, treat for luteal insufficiency.
5. Supplement with vitamins A, E and C and Ca, P and Se.
6. PSP dye test – if both fallopian tubes occluded. Exclude such animals.
7. Cytogenetic-karyotyping

Thank You