



# TRICHOMONIASIS

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## DEFINITION

- ✖ a **contagious venereal** disease of **cattle** characterized primarily by **early fetal death** and **infertility**, resulting in **extended calving intervals**. Panzootic disease.

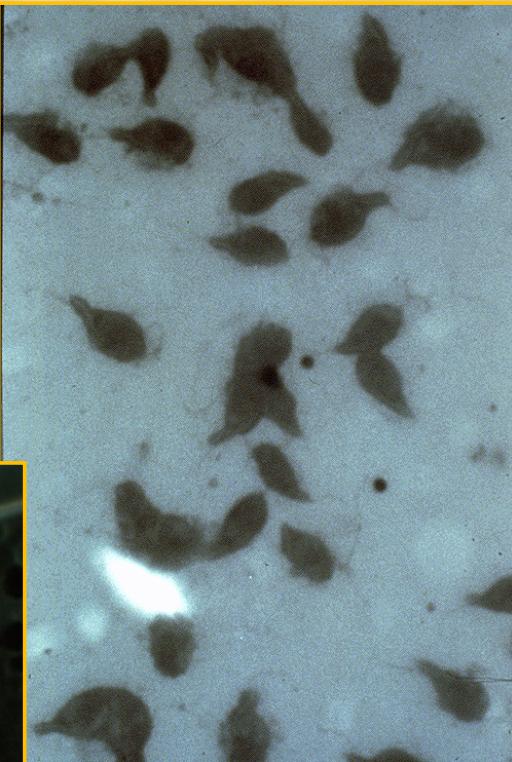
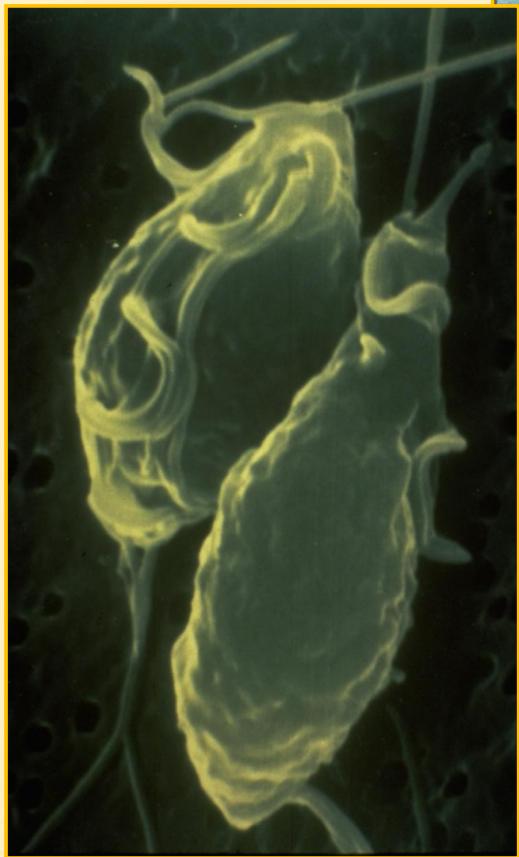
# ETIOLOGY AND EPIDEMIOLOGY:

- ✖ The causative protozoan, *Tritichomonas foetus*, is **pyriform** and ordinarily  $10\text{--}15 \times 5\text{--}10 \mu\text{m}$ . It may become spherical when cultured in artificial media. At its **anterior** end, there are **three flagella** approximately the same length as the body of the parasite. An **undulating membrane** extends the length of the body and is bordered by a marginal filament that continues beyond the membrane as **a posterior flagellum**.

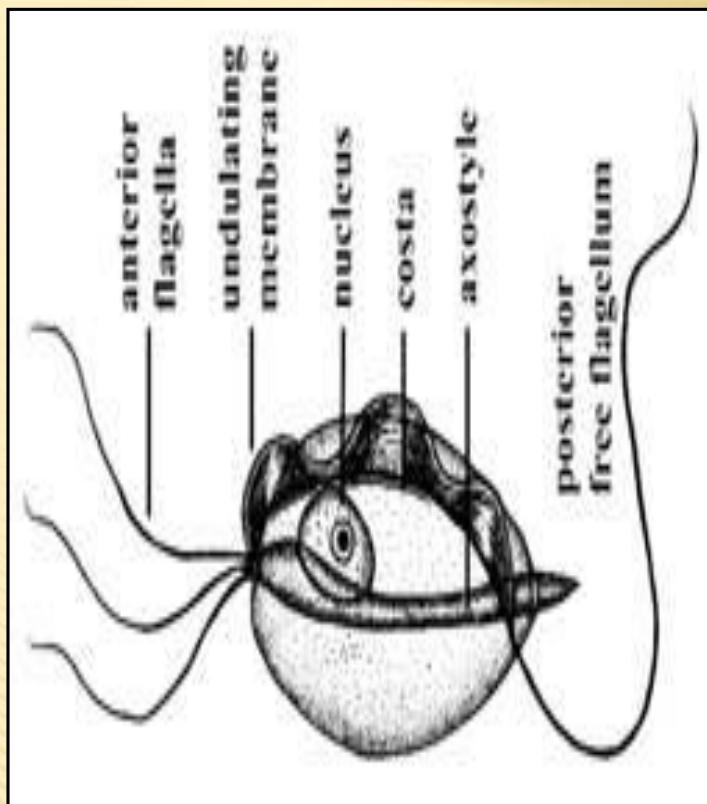
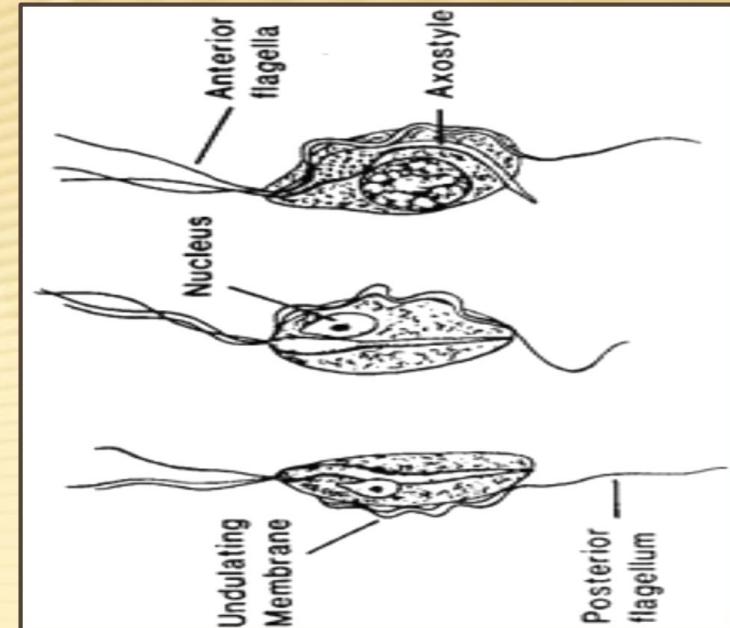
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- ✖ Organism survives in **microscopic folds** of skin that line the **bull's penis** and **internal sheath**
- ✖ It moves with **a jerky, rolling motion**

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- ✖ Although *T. foetus* can **survive** the process used for **freezing semen**, it is killed by drying or high temperatures.
- ✖ *T. foetus* is found in the genital tracts of cattle. When cows are bred naturally by an infected bull, 30%–90% become infected, suggesting that strain differences exist.
- ✖ Variation in breed susceptibility to trichomoniasis may also exist.

- ✖ **Bulls of all ages can remain infected indefinitely, but this is less likely in younger males.**
- ✖ By contrast, most **cows** are **free** of infection within **3 mo.** after breeding. However, **immunity is not longlasting** and reinfection does occur.
- ✖ Transmission can also occur when the semen from infected bulls is used for **artificial insemination**.

# SOURCE OF INFESTATION

- ✖ *T. Foetus* is found in the **genital tracts of cattle.**
- ✖ In the bull, in the **fornix and around the glans penis.**
- ✖ Bulls are the main reservoir (**long term carriers**) **samples are preferred.**

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- ✖ **Smegma in crypts (microscopic folds)**
  - + Penis
  - + Internal sheath
  - + **Crypts deepen with age – increases rate of infection**
- ✖ Infected for life
  - + Persistent infection (PI)

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# Bull's Age

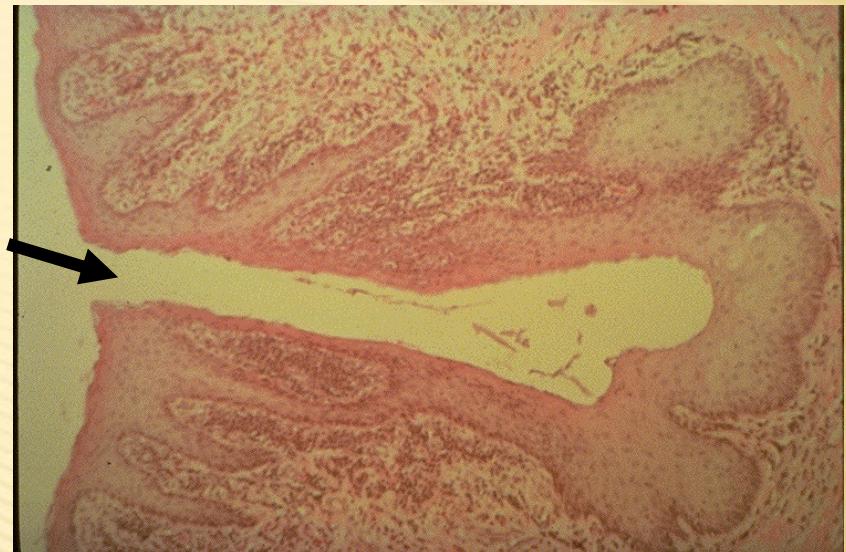
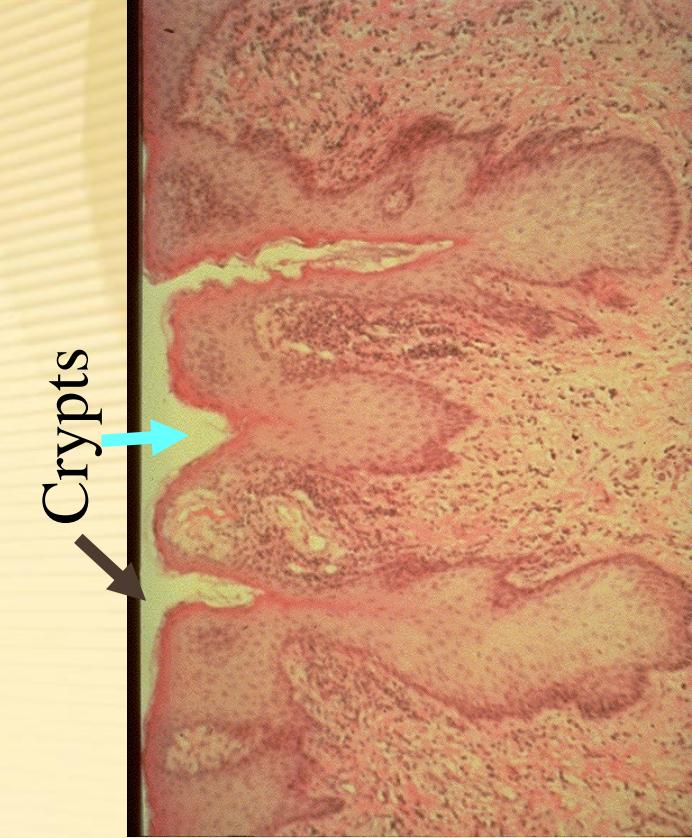
Older >5 yrs.    4 to 5 yrs.    Young < 4 yrs.



From Older Bull

Crypt

From Younger Bull



# MODE OF TRANSMISSION

- ✖ Primarily by **coitus** direct contact.
- ✖ In direct contact (**mechanical**) insemination instruments, **gynaecological examination** and artificial insemination.
- ✖ The protozoan can **survive** in whole or diluted semen at 5 °c or in **deep-frozen semen**.

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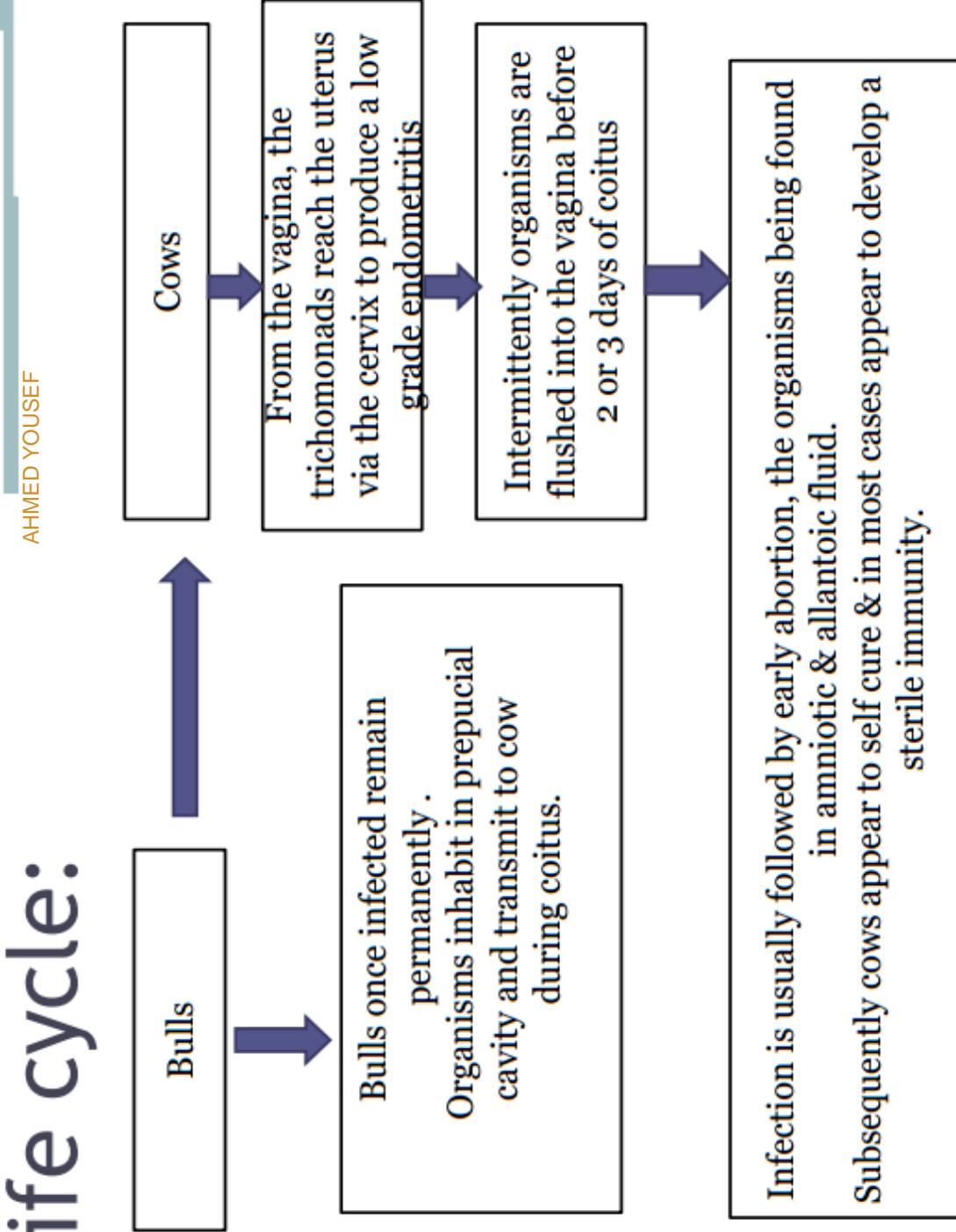
- ✖ **Venereal** – bull to cow – cow to bull
  - + Infected bulls breed clean cows/heifers
  - + Clean bulls breed infected cows (recent aborters)
- ✖ **Not cow to cow**
- ✖ **Not bull to bull**
- ✖ **Not from environment**

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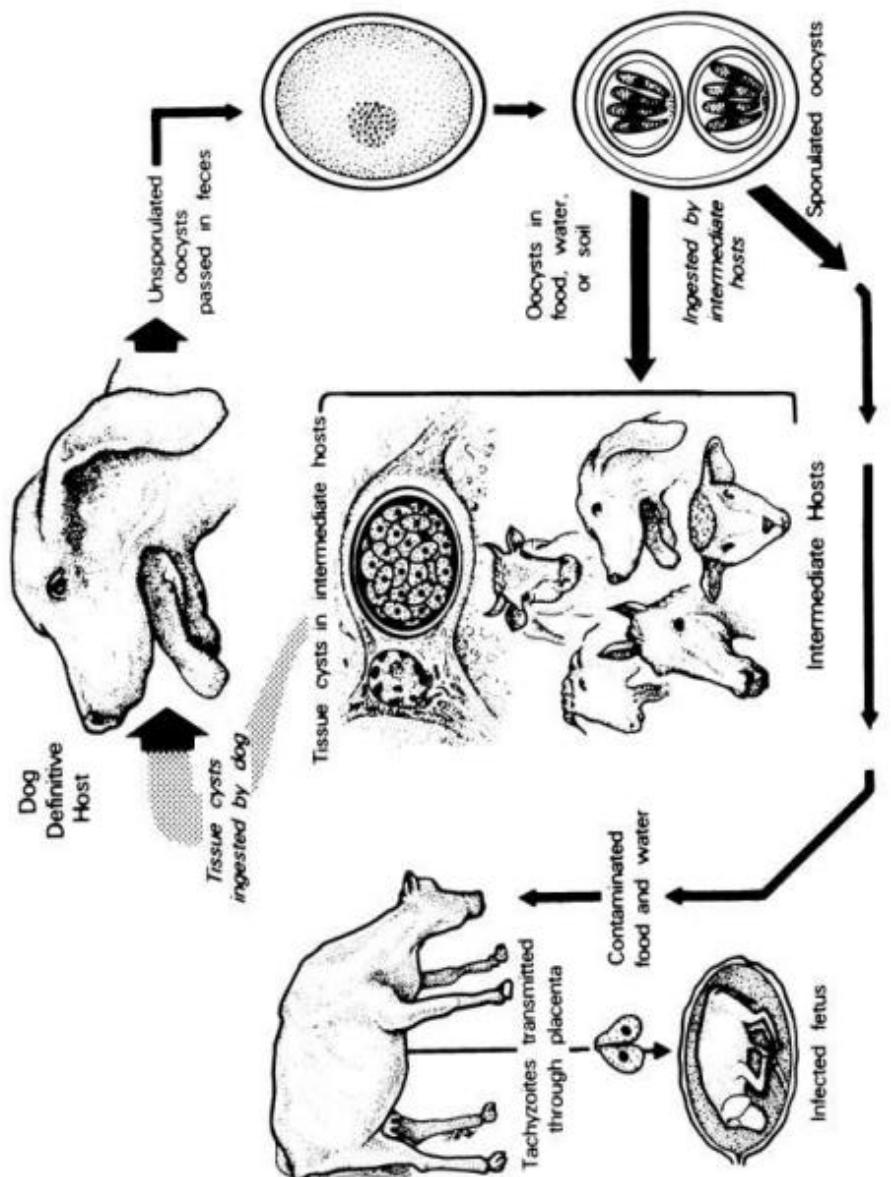
# ECONOMIC LOSSES

- ✖ economically devastating and costly to eradicate from a herd
  - + Increased replacement costs
  - + Increased veterinary costs
  - + Decreased herd income
  - + Early fetal death
- ✖ Infertility
- ✖ low pregnancy rates
- ✖ extended calving season
- ✖ Abortions in pregnant cows and heifers.
- ✖ very costly to eradicate from a herd

## Life cycle:



# Life cycle of trichomonas fetus:



## Pathogenesis:

- The bull transmits the disease through coitus.



- The infection follows early abortion, as the organism reaches uterus via the vagina to produce low grade endometritis.
- The infection follows early abortion, as the organisms will be harbored in the amniotic and allantois fluid.



- The cows are appear to get “self cured” and in most cases develop sterile immunity.  
↓

- Abortion is usually before four month of pregnancy.  
↓
- The is purulent endometritis.

## CLINICAL FINDING

- ✖ The most common sign is **infertility** caused by **early embryonic death**. This results in **repeat breeding**, and attending stock persons often note cows in heat when they should be pregnant. This, along with poor pregnancy test results (eg, **too many “nonpregnant normal” and late-bred cows**) is usually the presenting complaint.
- ✖ Irregular estrous cycle

- ✖ In addition to a **reduced number of cows estimated to calve during the regular calving season**, an increased number of cows with a “**nonpregnant abnormal**” reproductive tract diagnosis is seen. These include cows with **pyometra, endometritis, or a mummified fetus.**

- ✖ **Fetal death and abortions** can also occur but are not as common as losses earlier in gestation.
- ✖ apparently, live calves can be born to infected dams.
- ✖ Pyometra occasionally develops after breeding.

## A. INFECTED BULLS:

- Young bull (1 to 3 years of age) contacted with *T. foetus* does not develop any clinical signs of infection.
- With primary infection, swelling of prepuce with mucopurulent discharge may occur but does not last beyond 2 weeks.
  - **Prolapse of penis.**
  - Other bulls remain chronically infected

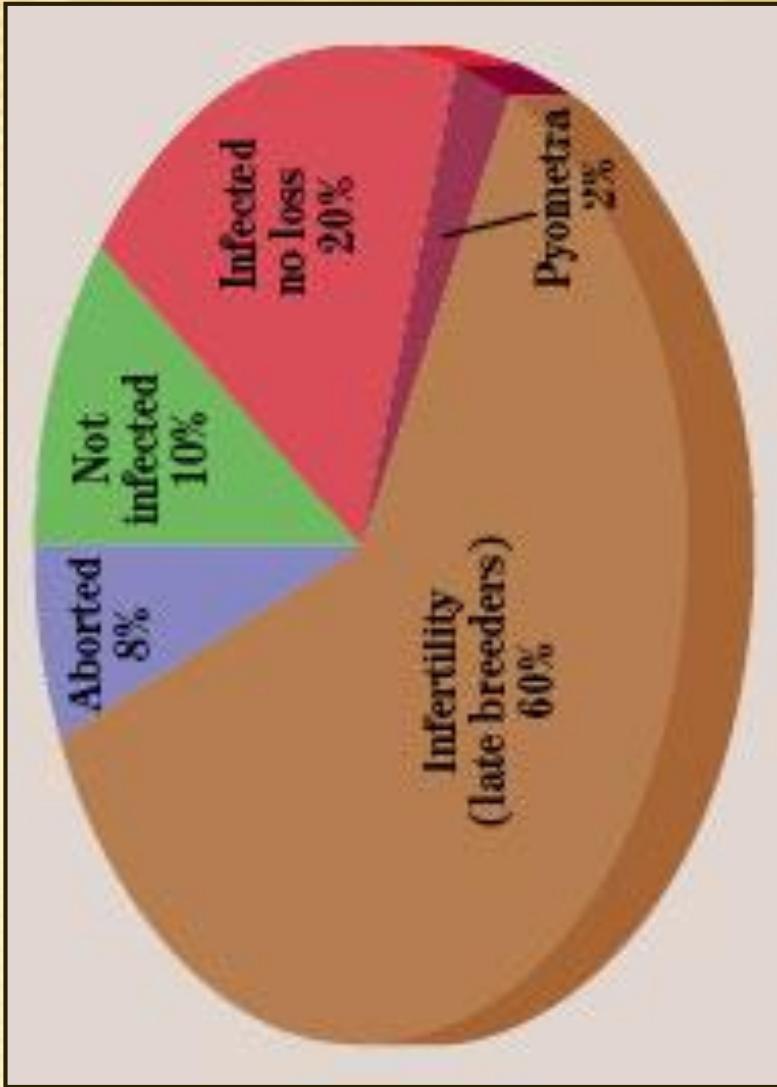
## B. INFECTED COWS:

Infection occurs in vagina at the time of coitus and cause:

- **Vaginitis, cervicitis, endometritis or salpingitis** in primary infection.
- **Endometritis** may cause death of **embryo**.

# DISTRIBUTION OF CASES IN AN INFECTED HERD

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Fig: swelling of vulva



Fig: Prolapse of penis



Fig: swelling of prepuce



Fig: aborted fetus

# DIAGNOSIS

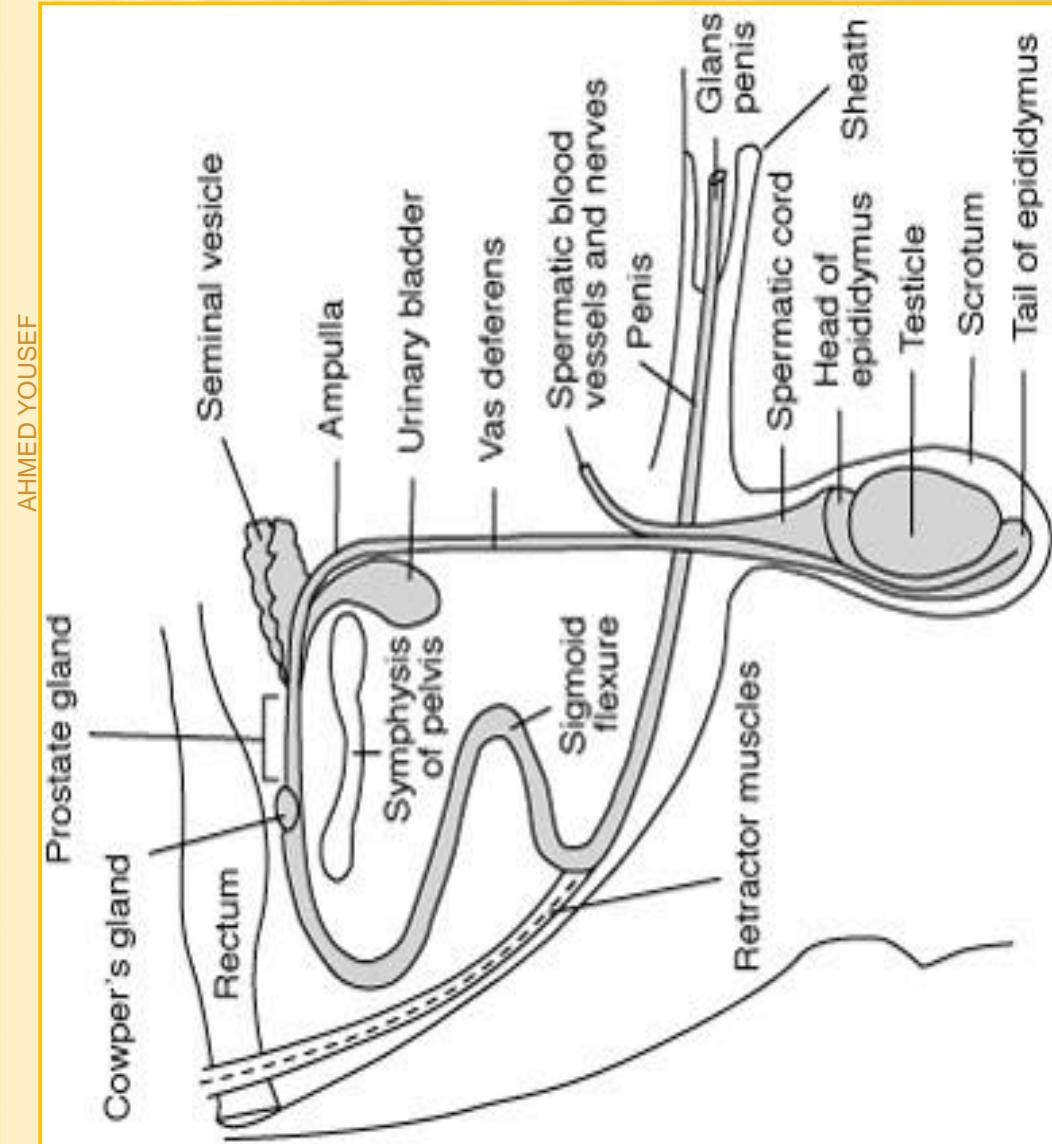
- ✖ A-Field diagnosis
- ✖ History and clinical signs are useful
- ✖ B- Laboratory diagnosis
  - ✖ Demonstration of protozoan in placental fluid, stomach contents of aborted foetus, uterine washings, pyometra discharge, or vaginal mucus.
  - ✖ Preputial and vaginal **washing**
  - ✖ **Preputial scrapings**

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## DEMONSTRATION OF *T. FOETUS*

- ✖ Collection, examination and culturing of **smegma** from **prepuce** and **glans penis**.
- ✖ Suction is applied to a pipette while it is used to **vigorously scrape** the epithelium in the **preputial fornix**. Alternatively, **douching** with **saline** or **lactated Ringer's solution** (without preservatives) can be used. Aspirates or douches, concentrated by centrifugation, are examined using **darkfield contrast microscopy**.

# COLLECTION APPARATUS



# PREPUCE SAMPLING

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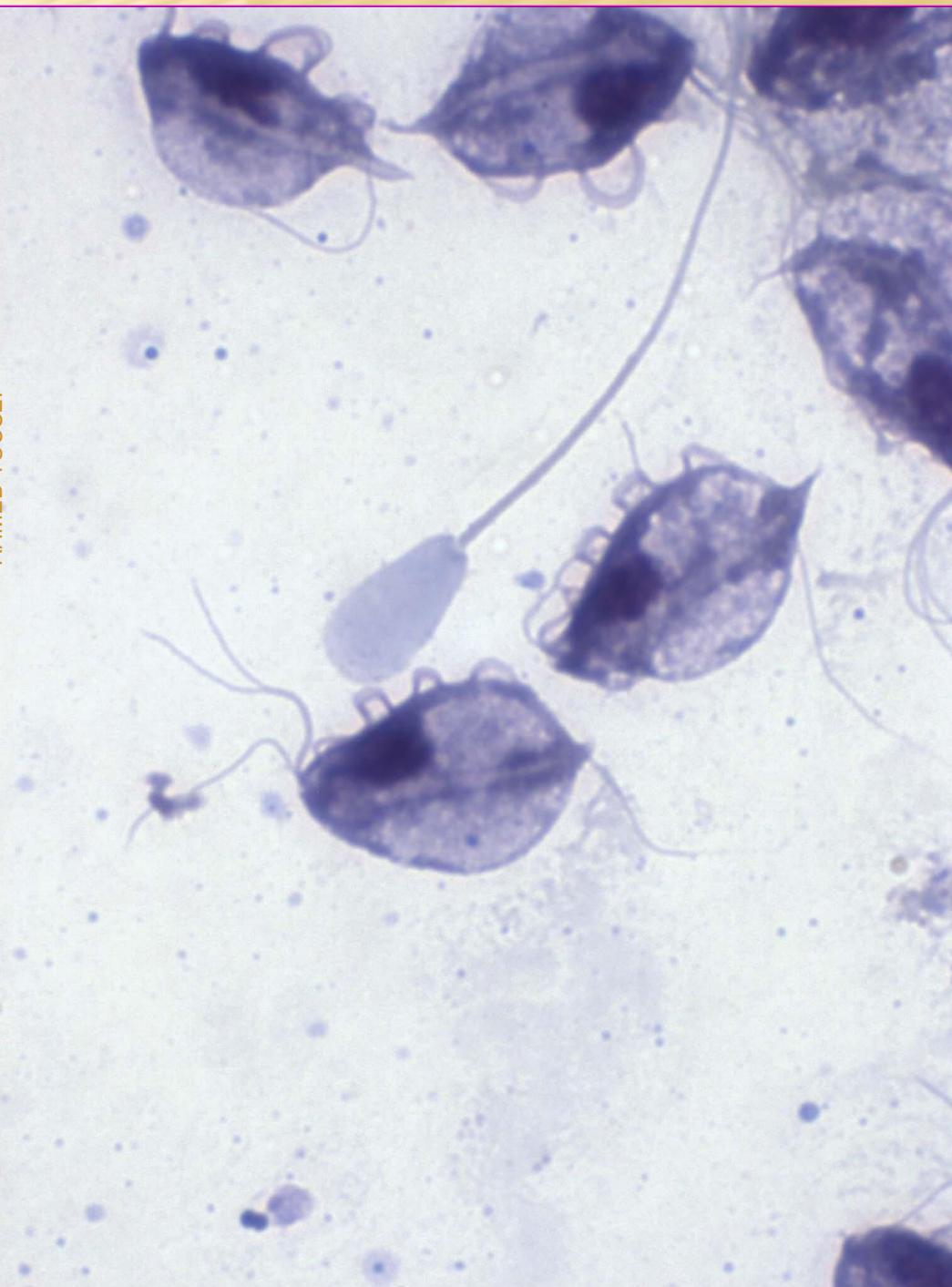


# TRANSFERRING CONTENT TO TUBE (PHOSPHATE BUFFER SALINE)

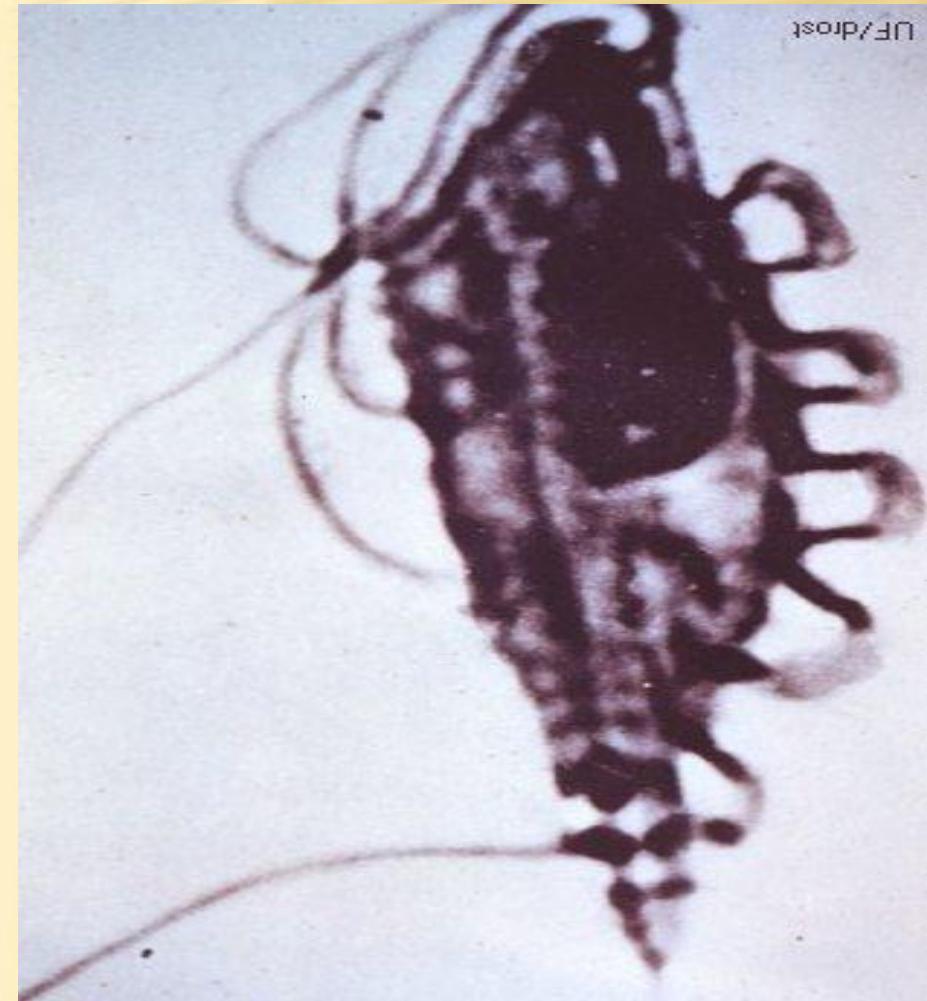
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- ✖ This material is also transferred immediately to the **surface of a liquid culture medium** such as **Diamond medium**. Better success culturing the organism has been reported when using commercially available media-filled pouches. In addition, incubating the media beyond the standard 48 hr may also enhance the accuracy of the diagnosis.

- ✖ Sampling every 48 hr for 10 days from the bottom of the tube and examining at 100–400× may reveal the **rolling jerky movements** of *T foetus*.

# PREPUTIAL SCRAPPING IN TRANSPORT MEDIA

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## FIELD CULTURE TEST (IN POUCH™ TF)



# SEROLOGICAL TEST

- ✖ Mucous agglutination test
- ✖ Mucous collected from cervix and an antigen made from cultured protozoan

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# ALLERGIC TEST (TRICIN TEST)

- ✖ An intradermal test used for diagnosis of bovine trichomoniasis.
- ✖ Middle site of the neck
- ✖ Tricin antigen: trichloracetic acid precipitate of *T. Foetus*
  - ✖ 0.1 ml intradermally (30-60 min)
  - ✖ Shallow plaque > 2mm thickness

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# PCR

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- ✖ A sample prepared (pbs) can be effectively examined for both trichomoniasis and campylobacteriosis by using a specific PCR application.

# IMMUNOHISTOCHEMISTRY ON TISSUES

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- ✖ Monoclonal antibody
- ✖ Tissue invasive *T. Foetus* in formalin-fixed paraffin embedded sections of placenta and fetal lungs.

# TREATMENT

- ✖ Various **imidazoles** have been used to treat bulls, but none is both safe and effective.
- ✖ **Ipronidazole** is probably most effective but, due to its low pH, frequently causes **sterile abscesses** at injection sites.
- ✖ In addition, bulls are probably susceptible to reinfection after successful treatment.

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- ✖ Resistance to ipronidazole may also be a concern. The biggest problem, however, is that the success of treatment is measured by repeated sampling, which may mean the individual bull can never be definitively called negative. Therefore, an unqualified recommendation for the bull's use cannot be given.

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## CONTROL AND PREVENTION

- ✖ Eliminating the infection from the bull battery by culling all bulls and replacing them with virgin bulls or by testing and culling positive bulls.
- ✖ Repeated testing in older bulls may be unsatisfactory, and it may be prudent to **cull them all.**
- ✖ Reinfestation is prevented by exposing only the uninfected (clean) bulls to uninfected (clean) cows.

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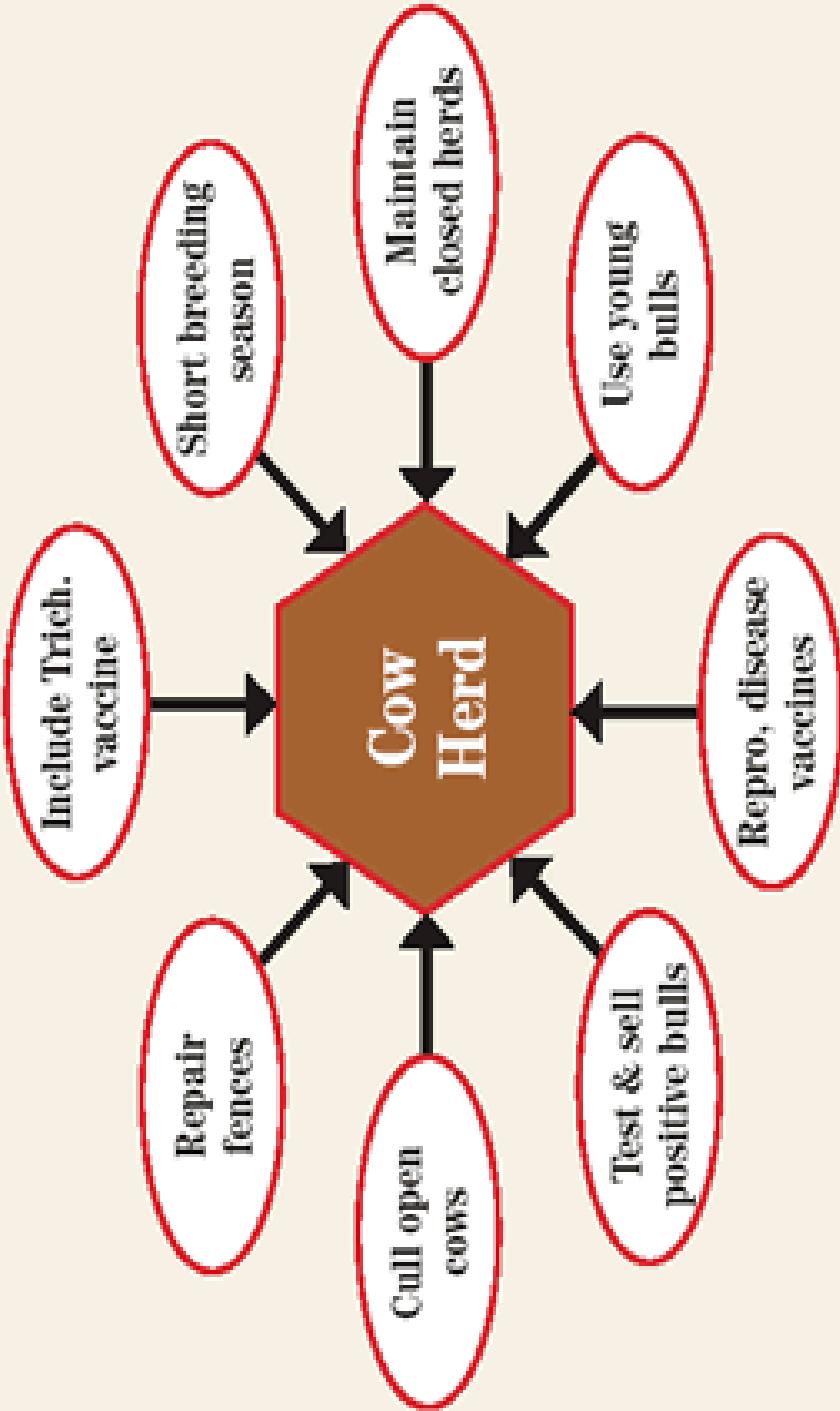
- ✖ Clean cows are assumed to be those with calves at foot (even though some infected cows may produce a live calf) and virgin heifers.
- ✖ In situations in which several herds are commingled on the same range, caution must be exercised to ensure that cows and heifers are not exposed to potentially infected bulls at the home ranch before they are turned out on the common grazing pasture.

- ✖ *T foetus* can be safely eliminated from semen with **dimetridazole**.

- ✖ Vaccines developed some time ago for use in cows and evaluated in the field were not highly effective, especially in the absence of other control measures. However, the efficacy of whole-cell *T foetus* vaccines has recently been critically reviewed.

## Trichomoniasis preventative measures

A number of management processes need to take place concurrently to keep trichomoniasis out of cow herds.



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