

# Campylobacteriosis

## Bovine genital campylobacteriosis

AHMED YOUSEF

### Synonyms

- **Vibriosis**, Abortion, Epizootic abortion.

AHMED YOUSEF

# Defention

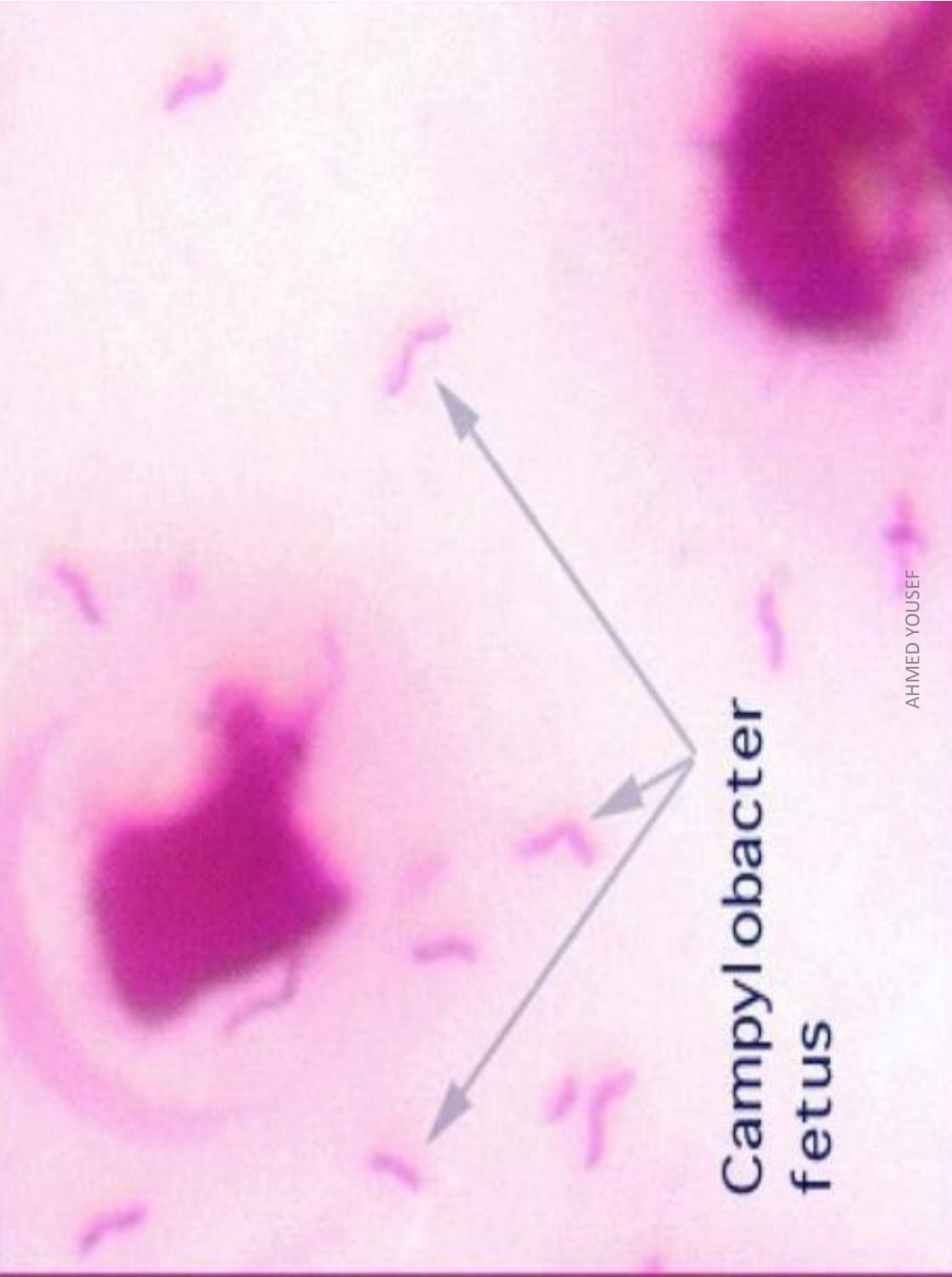
- a **contagious Venereal disease** of cattle characterized by infertility with repeat breeding.
- Early abortion are common and **late abortions** from **4 months of gestation to full term** are occasionally observed.

AHMED YOUSEF

## Etiology

- **Background of Campylobacter**  
**1-Gram negative curved rods**  
2-Campylobacter species are found in the intestinal and genital tract of domestic animals and are widely distributed geographically  
3-the principal disease conditions associated with infection are either diarrhea or genital causing infertility or abortion  
4-Campylobacter were previously classified inside the genus vibrio later on separated from the genus Vibrio due to difference In G+C content ( 40 to 50 in vibrio and 30 to 35 in campylobacter )
- **comma( , )** or 'S' shaped and occasionally as long spirals.  
motile and has no capsule and does not form spores.  
It is gm -ve

AHMED YOUSEF



**Campylobacter  
fetus**

AHMED YOUSEF

- *Campylobacter* spp are very labile and are destroyed quickly by heating, drying, and exposure to the atmosphere. Unless cultured quickly after collection from the animal and grown under microaerophilic or anaerobic conditions, *Campylobacter* spp will not grow.

- **Capmylobacteriosis** is a group of diseases affecting different species of animals Caused by **Campylobacter** species  
**In cattle Bovine genital campylobacteriosis caused by *C.fetus subspecies venearis***  
**In ewes Ovine genital campylobacteriosis caused by *C.fetus subspecies fetus* or *C.jejuni***

AHMED YOUSEF

- **BOVINE CAMYLOBACTERIOSIS**  
caused by ***C.fetus subspecies venearis***

AHMED YOUSEF

# Susceptible Hosts

Cattle, Buffalo, Sheep and Goat

Heifers are most affected (immunity cattle)

Bulls 4 years or older more than younger  
(chronic)

AHMED YOUSEF

## Source and mode of transmission

- *C fetus* is transmitted **venereally** and also by contaminated instruments (**artificial vagina**), bedding, or by **artificial insemination** using contaminated semen. Individual bulls vary in their susceptibility to infection; some become **permanent carriers**, while others appear to be resistant to infection. The primary factor associated with this variability seems to be the **age-related depth** of the **preputial** and **penile epithelial crypts**.

AHMED YOUSEF

- In **young bulls** (<3–4 yr old), in which the **crypts have not yet developed**, infection tends to be transient, with transmission apparently relying on sexual contact with a noninfected cow within a matter of minutes to days after the initial breeding of an infected cow. Spontaneous clearance in these younger bulls does not seem to be related to any immune response, so reinfection can readily occur.
- In **bulls >3–4 yr old, the deeper crypts may provide the proper microaerophilic environment required for chronic infections to establish.**

AHMED YOUSEF

- The natural habitat - bovine reproductive tract.  
In bulls, the organisms remain confined to the **prepuclial cavity** and in particular to the **mucosa of glans penis, prepuce and distal portion of the urethra**.  
In heifers and cows, the sites of infection are the lumen of **vagina, cervix, uterus and oviducts**.

AHMED YOUSEF

- Coitus
- artificial insemination where infected semen is used
- **bull to bull** by contaminated semen collecting apparatus (**artificial vagina**)

AHMED YOUSEF

## Economic importance

- Drop in conception rate 40 % newly infected herd
- Long term conception rate 70 %
- Permanent infertility in cows
- **Sporadic abortions 6<sup>th</sup> months of gestation**

AHMED YOUSEF

# Pathogenesis

- The fertilized ovum gets exposed to infection either by already present organism in female reproductive tract or through the infected semen.

AHMED YOUSEF

- Concurrent with the growth of the embryo, the organisms also increase its strength by multiplication.

The organisms multiply in the cervix and reach the uterine horn and oviduct in 7 – 14 days.

AHMED YOUSEF

- In the early abortion upto 4 months of gestation, the embryo is expelled along with foetal membranes.
- When the abortion occurs after 5 months of gestation, the **placenta is retained**.

---

AHMED YOUSEF

- The organisms damage the cilia of epithelial lining of the oviduct and thereby **interferes with fertilization**.

---

AHMED YOUSEF

- During the **luteal phase**, uterus of the cow becomes susceptible to infection & during preimplantation period the embryo on requires sufficient oxygen and at this time there is **competition for oxygen between bacteria and embryo leading to drop in dissolved oxygen.**
- since, campylobacter has got an obligatory mode of metabolism, thus it can rapidly lower the dissolved oxygen & embryo does not get sufficient oxygen so, it can not survive & is expelled.

AHMED YOUSEF

AHMED YOUSEF

# Clinical signs

AHMED YOUSEF

## cattle

- Bovine genital campylobacteriosis
  - (*C. fetus subsp. Venerialis & C. fetus subsp fetus*)
- Infertility
  - Early embryonic death
  - Prolonged calving season
- Cows are **systemically normal**, but there is a variable degree of **mucopurulent endometritis** that causes early embryonic death, prolonged luteal phases, irregular estrous cycles, repeat breeding, and, as a result, protracted calving periods, assuming the **breeding season is long enough** to allow for complete clearance and a successful rebreeding.

AHMED YOUSEF

- **Abortion** may **4-7** months of gestation
- Observed abortions are not common. In herds not managed intensively, disease may be noticed only when pregnancy examinations reveal low or marginally low pregnancy rates but, more importantly, great variations in gestation lengths, especially when the disease has recently been introduced to the herd. In subsequent years, infertility is usually confined to replacement heifers and a few susceptible cows.
- **Bulls** are **asymptomatic** and produce normal semen

AHMED YOUSEF

## Sheep

- ***C. Fetus subsp fetus & C. Jejuni.***
- Late term abortions, **stillbirth** and weak lambs.
- Metritis & deaths
- Recovery, immunity to reinfection, is typical.
- Persistently infected and shed bacteria in the faeces.

AHMED YOUSEF

# P.M

AHMED YOUSEF

## Cattle

- **Aborted foetus:- bronchopneumonia, mild fibrinous pleuritis or peritonitis.**
- **Placentitis, cotyledons hemorrhagic and intercotyledonary area *oedematous*.**

AHMED YOUSEF

# Sheep

- 1 to 2cm orange-yellow necrotic foci in the liver.
- **Placentitis**, cotyledons hemorrhagic & necrotic and **intercotyledonary area oedematous or leathery areas.**

AHMED YOUSEF

## Diagnosis

- Field:
- Records and clinical signs
- Laboratory:
  - Samples: bulls, cows and aborted foetus.
  - Semen, preputial secretions
  - Mucous samples, vaginal lavage, tampons.
  - Internal organs of aborted foetus, culture wet preparations of the stomach contents- dark-field and phase contrast microscopy.

AHMED YOUSEF

*Campylobacter fetus fetus*, cultured after bovine abortion,  
darkfield microscopy.

Courtesy of Dr. J. Glenn Sonner.



AHMED YOUSEF

- Bacteriological culture
- Microaerobically at 37°C for at least 3 days
  - C. fetus* will survive for only 6–8 hr after collection, but inoculation into Clark's or similar media will allow survival for >48 hr. For maximum accuracy, bulls should be sampled twice, about 1 wk apart.
  - Contamination by non-pathogenic faecal *Campylobacter* spp

- A vaginal mucus agglutination test (VMAT) is useful, but because of variability in individual responses, at least 10% of the herd or at least 10 cows should be sampled.
- An ELISA test has been developed for use on vaginal mucus and is said to be more sensitive and able to detect a wider range of antibody responses than the VMAT.

AHMED YOUSEF

## Treatment

- The infection can also be eliminated in bulls by 1–2 treatments with **streptomycin** at 20 mg/kg, SC, together with 5 g of **streptomycin** in an oil-based suspension applied to the penis for 3 consecutive days.
- For practical reasons, cows are not usually treated for genital campylobacteriosis.

AHMED YOUSEF

# Control

- **Artificial insemination** is an excellent way to prevent or control genital campylobacteriosis.
- Because *C. fetus* has been isolated from cows for >6 mo after the end of pregnancy, it has been suggested that artificial insemination should continue until all the cows in a herd have been through at least two pregnancies.
- Cleaning & disinfection of all instruments used for A.I.

AHMED YOUSEF

## Eradication (vaccination)

- Inactivated with formalin or oil-emulsion adjuvant.
- In routine use, the vaccine should be given once, about 4 weeks before breeding starts; due to antibody response short-lived, revaccinated halfway breeding season.
- Bulls twice dose for cows 4 weeks apart

AHMED YOUSEF