

# Diagnosis of Trichomoniasis: Herd History and Culture Techniques

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Trichomoniasis is a venereal disease of cattle characterized by infertility, early embryonic death and occasionally by pyometra and abortion. The etiological agent is a protozoan, *Tritrichomonas fetus* (*T. fetus*).

## Incidence

The incidence of Trichomoniasis in the United States is difficult to ascertain because of the nonreportable status of the disease. One study indicated an incidence of 7 to 8% in Oklahoma market bulls (1) and another reported a 5.8% infection rate in California bulls (2). An Australian study showed that 24.7% of all bulls and 6.4% of the cows were infected with *T. fetus* (3).

## Pathogenesis

In bulls, *T. fetus* localizes in the penis and preputial membranes. It causes no lesions of diagnostic significance and affects neither the semen quality nor sexual behavior (2).

In the female, the protozoan localizes in the secretions of the vagina, uterus, cervix and oviduct. A mucopurulent discharge is often, but not always, present and may be associated with vaginitis, cervicitis, endometritis, salpingitis, or pyometra. The discharge is often small in quantity (4).

The organism may persist up to 95 days in the female reproductive tract as diagnosed by cervicovaginal mucus culture (5). Frequent services with prolonged periods between heat periods due to early embryonic death (EED) of the fetus from 15 to 80 days of gestation may be seen (6). Embryonic death may be due to the inflammatory response detectable in the uteri of heifers about 50 days postservice. Once infected, females remain infertile for 2 to 6 months (4).

Palpable postservice pyometra and abortions are most common in chronically infected herds. Although these are the less common manifestations of *T. fetus* (4), pyometra may occur in up to 10% of the herd while abortion in the first third to fifth month is rare (7). However, in a recent outbreak in Southeastern Oregon an abortion rate of up to 10% was observed and *T. fetus* was isolated from several feti (8).

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## Immunity

After a period of infertility, females then become immune and will conceive or carry a calf to term even if they are bred by infected bulls. The duration of immunity varies between animals. Occasionally a cow will carry the infection through gestation and parturition (6). The incidence of the postpartum infection decreases with time and the number of estrous periods, however, the possibility of a chronically infected carrier female exists (4). This must be kept in mind in herd treatment.

Bulls are usually permanently infected and only occasionally does spontaneous recovery occur (6). Bulls over 4 years of age tend to become permanent carriers, whereas most younger bulls either recover spontaneously or do not contract the disease. However, certain young Brangus, Santa Gertrudis (4) and Texas Longhorn bulls become permanently infected (9).

## Herd History

A herd of 1500 cows in Eastern Oregon had reported a 60 to 70% calf crop over a four-year period although they had repeatedly vaccinated for vibriosis, leptospirosis (8 strains), infectious bovine rhinotracheitis (IBR) and bovine virus diarrhea (BVD). This same herd had a higher calving rate (85%) in first calf heifers bred to virgin bulls. A pyometra resembling a four-month pregnancy was diagnosed in the twelfth cow palpated.

A herd of 600 cows in Southwestern Montana had 250 open cows at fall pregnancy testing time. This herd had been vaccinated for vibriosis, leptospirosis (5 strains), IBR and BVD previous to turning in the bulls. The herd was in communication with 23 other herds of cattle in an open grazing system. The third heifer palpated had a pyometra resembling a 45-day pregnancy.

## Diagnosis

In diagnosis of pyometra, by rectal palpation, it is very important to keep in mind that there are only four positive

signs of pregnancy:

- the fetal membrane slip,
- the amniotic vesicle,
- the cotyledons, and
- the fetus (10).

None of the above signs are present in pyometra. However, the suggestive signs of pregnancy such as fluid, fluctuation, asymmetry of the uterine horns and fremitus of the middle uterine artery may be. A trichomonad pyometra resembles a pregnancy very closely except none of the positive signs of pregnancy are present. In my experience, postservice pyometra has been diagnosed by palpating less than 1% of the total herd.

Once pyometra is diagnosed a uterine insemination pipette is passed through the cervix into the uterus and pus is withdrawn into a syringe. The pus in trichomonad pyometra has a characteristic thin, yellow-gray, watery, flocculent consistency, often containing flakes of pus and shreds of fetal membranes. The pus has been described as having a potato soup color and consistency. Odor may be absent or rather sweetish, but is not fetid (6).

Diagnosis is made by microscopic examination of the contents of the genital tract. If the diagnosis is from the pus of a pyometra or an aborted fetus the direct method is used in which a small amount of fluid is placed under a coverslip and examined at 40 to 100 power magnification using reduced light. The continuous rolling motion of the trichomonads is perceived as irregular jerky motions. At 400 power the undulating membrane and flagellae can be viewed.

If diagnosis is attempted from the preputial membranes of the bull or cervicovaginal mucus of the cow, samples can be split, half for direct examination and half for transport in culture medium. Culture methods usually result in 8% additional positive results in samples found negative by direct microscopic examination (7).

A transport medium of buffered saline solution with 5% fetal bovine serum added, or of lactated Ringer's solution, is simple to use and is effective as a transport medium for up to 48 hours if refrigerated (2). Diamonds media (4), or Kupferberg media (2), should be used if transport time will exceed 48 hours.

Incubation at 37° C in Diamonds media is ideal for diagnosis (4,7). *T. fetus* grows at the bottom of the tube and contaminants grow at the top. A few drops from the bottom of the tube can be examined at 24 hour intervals under a microscope. If no trichomonads are found by 7(7) or 10 (2) days the sample is usually considered negative. Positive samples are usually diagnosed by 24 to 48 hours.

In bulls it has been concluded that 3 weekly culture intervals by the pipette method is adequate to identify all

infected bulls in a herd (2). Specimens of preputial secretion are collected using a dry plastic uterine infusion pipette attached to a 12 ml syringe. The pipette is introduced into the fornix of the prepuce, the syringe is opened to at least the 10 ml mark, and the pipette is moved back and forth approximately 13 cm. Smegma (0.2 to 1.0 ml) is then rinsed into 3 ml of transport media (2). The pipette method is superior to the douche technique (2,4) and is 97% accurate with culture media (2).

## Conclusion

The history of an increasing problem of infertility characterized by failure of conception after frequent services, prolonged periods of service before the next estrual period, the occurrence of occasional early abortions and pyometra are characteristic symptoms of *T. fetus*. With the exception of pyometra, these symptoms are also quite characteristic of vibriosis in cattle. A history of vaccination for vibriosis in the herd will aid in the differential diagnosis.

Diagnosis of trichomonad pyometra by rectal palpation is a method not emphasized enough by most articles or text books. A skilled palpator will find this indeed a highly accurate method.

Direct examination of the protozoan from an aborted fetus, or the pus from a pyometra, as well as culture in Diamonds media from preputial smegma of the bull or cervicovaginal mucus of infected cows is accurate in obtaining a diagnosis.

Perhaps the disease should be of reportable status because many infected cattle are sold through auction, or private treaty, only to spread the disease to other herds.

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