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Important sexually transmitted diseases affecting bovine reproductive health

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With the breeding season upon us, it is pertinent to review the diseases that can have a significant impact on the fertility and overall economics and productivity on the farm. In the beef industry, it is important to get cows pregnant early in the breeding season, to ensure a uniform and heavier calf to market. In the dairy industry, continuous milk production is dependent on proper management of the inter-calving period per cow. Sexually transmitted diseases (STDs) that wreak havoc with fertility through lowered conception rates or increased days to conception, abortion, delayed or extended calving seasons, and other associated reproductive losses should therefore be avoided at all cost.

One of the important STDs in cattle that will be discussed in this article is trichomoniasis. Trichomoniasis is caused by a flagellated protozoa, *Tritrichomonas foetus*. It is interesting to take note of the different spelling of 'foetus' vs 'fetus' in the nomenclature. *T. foetus* was discovered, and subsequently named, by Riedmüller in Europe in the early twentieth century, hence the 'o'.²

A major concern with trichomoniasis is that often by the time the disease is detected, the economic impact has already been significant.²

Coitus is the main mode of transmission.² Affected bulls neither show clinical signs nor have gross pathology, but there could be some histological infiltration of lymphocytes and plasma cells into the penis and prepuce.^{1,2} The parasite establishes itself on the surface of


the stratified squamous epithelium of the penis and anterior part of the prepuce, where it is more likely to persist in older bulls (> 3 years of age) due to the age-related changes in their anatomy.² These include more mucosal folds, deeper crypts and a reduced oxygen tension at the predilection sites, which creates a more favourable environment for the survival of the facultatively anaerobic *T.foetus*.^{1,2}

Cows on the other hand are usually adversely affected. These adverse effects include inflammation all the way from the vagina to the oviduct, including the cervix and endometrium, which can lead to foetal death and abortion or resorption.^{1,2} Usually, fertilisation as well as early development of the embryo, continues unhindered even in the presence of the parasite, with foetal death peaking at around 7 to 10 weeks of age.² Approximately 5% of cows may develop a 'post-coital pyometra'.²

Often, a farmer will only suspect something is amiss when confronted by the associated reproductive failure of 'delayed' conception, return to service and/or irregular oestrus cycles.^{1,2} In a herd that uses natural service, oestrus activity might decrease after breeding initially due to the fact that the embryo survives long enough to prevent a PGF2 α release from the uterus.² If the bulls are kept with the cows, this might lead to rebreeding without the farmer's knowledge, or if the farmer observes a shortened breeding season and removes the bulls, no rebreeding will occur. The respective consequences is that the wider than expected distribution of foetal ages or the non-pregnant cows, might only be discovered at the first pregnancy check by the veterinarian.² It has been estimated that trichomoniasis can diminish the calf crop by 14 – 50 % and reduce weaning weights and return on investment per calf by between 4 and 10 %.¹

Diagnosis usually involves cell culture and/or polymerase chain reaction (PCR) or both, following preputial scraping and washing, with varying sensitivity and specificity.¹ The history of a newly introduced, loaned or fence jumper bull would raise significant suspicion.² One concern noticed is the possibility of false positive identification of *T. foetus* from preputial wash samples cultured from virgin bulls.¹ These trichomonads are similar in morphology to *T. foetus* but are usually associated with the gastro-intestinal tract. They end up in the genital tract due to virgin bulls mounting each other and is then mistaken for *T. foetus* when observed under low magnification where the precise amount of anterior flagellae cannot be established.^{1,2} Differential diagnosis non-infectious in nature might include poor reproductive performance due to protein-energy malnutrition or heat stress during the breeding season.² Sperm present in the epididymis at the time of the heat stress might still be viable and therefore produce semen of adequate quality for approximately a week after the insult, but thereafter it can take up to 60 days for new, viable sperm to be produced – also leading to widespread pregnancy stages.²

Treatment and management of trichomoniasis is not straightforward and has always been a topic of controversy. Moving away from natural service towards artificial insemination, using semen from reputable companies that employ rigorous disease testing, is one method of minimising the risk of sexually transmitted diseases.^{1,2} While cows can clear themselves of the infection and develop a short-lived immunity, this should not be relied upon as carrier states (albeit rare) also exist and these cows pose a risk of re-infection to both the bulls (directly) and the rest of the cows in the herd (indirectly).^{1,2} Vaccination against trichomoniasis can also aid in the prevention and management of the disease.¹

Trichguard[®] is a Zoetis vaccine that contains killed, concentrated cultures of *Tritrichomonas foetus* suspended in a special oil adjuvant for the vaccination of healthy cattle as an aid in the prevention of disease caused by the afore-mentioned parasite. 

References:

1. Michi AN, Favetto PH, Kastelic J, Cobo ER. 2016. A review of sexually transmitted bovine trichomoniasis and campylobacteriosis affecting cattle reproductive health. *Theriogenology*. 85:781-791.
2. BonDurant RH. 2005. Venereal diseases of cattle: natural history, diagnosis, and the role of vaccines in their control. *Vet Clin Food Anim* 2005: 383-408.

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TrichGuard[®]: Reg. No.: G1749 (Act 36/1947). Killed, concentrated cultures of *Tritrichomonas foetus*.

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