

Dynamics of *Tritrichomonas foetus* Infection in Bulls Used for Natural Service in a Florida Dairy Farm

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Introduction

The economic impact of bovine trichomonosis has been well reported for beef and grazing livestock. However, in dairy farms the extensive use of artificial insemination (AI) has reduced its prevalence. The one exception is those herds where natural service (NS) is a part of the reproductive management and the potential for venereal disease transmission exist. In the US, a considerable number of dairies use bulls in their reproductive program. In the Southeast, de Vries *et al.*, (2005) reported that 70% of herds used NS along with an AI program. Worldwide trichomonosis is considered a major cause of infertility in cattle bred by natural service. *Tritrichomonas foetus* (*T. foetus*) is a flagellate, obligate, anaerobic protozoa which causes venereal disease in domestic animals. The transmission of *T. foetus* occurs at coitus when an infected bull breeds a susceptible female or vice versa. In bulls, the infection is asymptomatic. In females, the protozoa cause embryonic death during early stages of pregnancy and temporary infertility. However, pyometra or abortions are the only clinical signs that may be observed. The objective of this study was to evaluate the prevalence of *T. foetus* in dairy bulls used for natural service in Florida dairy farm.

Materials and Methods

The study was conducted in a 2,200 Holstein dairy herd located in north central Florida. Preputial fluid was collected from 135 Holstein bulls, 18 to 36 months old, and was inoculated in a Diamond's medium during a breeding sound evaluation between April of 2009 and February 2010. Bulls underwent a periodic breeding cow pen rotation and a sexual rest of 15 days. Each bull sample was taken at the mid-point of the 15 day rest period. The sample was taken from the prepuce by vigorous scraping using a clean infusion pipette. Immediately after collection, the specimen was placed in a modified Diamond's medium, which was kept in an incubator and maintained at 99°F (37°C). Sample evaluation was performed by microscopy at 24 and 120 hours after

sample collection at the University of Florida, College of Veterinary Medicine, Microbiology/Parasitology Lab. The diagnostic characteristics of *T. foetus* included: a protozoal organism ~20 µm x ~10 µm in size, the presence of three anterior flagella, one trailing posterior flagellum, and a distinct undulating membrane. Positive samples were confirmed by polymerase chain reaction detection of parasite nucleic acid.

Results

There were a total of 135 samples. The average age in bull population was (26.7 +/- 10 months). Ninety-six % were below 31 months old. Ten culture samples were confirmed positive to *T. foetus* at either the 24 or 120 hour culture. Nine of those samples were confirmed positive by PCR. Infected bulls were removed from the herd. The *T. foetus* prevalence was 7% within the test population; this coincides with the prevalence reported in Florida beef herds. The age interval in months for bulls that tested positive were 20 – 25 m (n= 4); 26 to 31 m (n= 3) and 32 – 37 m (n= 3).

Significance

The estimated prevalence of Trichomonosis for bulls sampled in this study was 7%. These results indicate that *T. foetus* was present in the dairy farm during the study period. In beef herds *T. foetus* infection has a predilection for older bulls, a report from Florida found a mean age of infected bulls to be 5.5 years. The relatively young acquisition and breeding age (40% of total infected between 20 to 25 months), suggests that infected cows with *T. foetus* were the likely source of bull infection. The use of young bulls for NS in dairy herds can harbor this venereal disease and then, either by mechanical or by infective mechanism transmits the organism to non-infected cows. Consequently, implementation of diagnostic programs for identification and elimination of positive bulls in combination with diagnosis of infected cows is necessary for the control of *T. foetus* in dairy farms using natural service.