

The Prevalence of Trichomoniasis in Oklahoma Beef Bulls

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Trichomoniasis, caused by *Trichomonas fetus*, is a widespread disease of cattle throughout the world (1). This organism was first recorded in the United States in 1932 and was soon acknowledged as an important etiologic agent in cases of bovine reproductive disease (2,3). Since that time improvements in veterinary care, diagnostic and treatment procedures, decreases in existing dairy herds, and the increased use of artificial insemination have led to an apparent decline in the prevalence of trichomoniasis and a corresponding reduction in interest in this organism as a disease producing agent (4,5,6).

A study conducted in the early 1960's revealed a prevalence of *T. fetus* in western beef bulls ranging from 0% to 12.0% (6). In Oklahoma, with the nation's third largest beef cow population, bovine trichomoniasis has not been well documented, although identification of infected animals has been made at the Oklahoma State University College of Veterinary Medicine for many years (7).

The purpose of this study was to determine the prevalence of *T. fetus* in beef bulls at a large Oklahoma public auction and to estimate the potential economic impact of trichomoniasis on Oklahoma's beef industry.

Materials and Methods

Over an eight-month period (November 1977 - June 1978), samples were taken from beef bulls two years or older consigned for sale at a large livestock auction in central Oklahoma. While restrained for normal market procedures, each animal was aged and evaluated for general condition. A sterile 6-inch cotton-tipped swab was introduced into the preputial cavity while simultaneously massaging the external aspects of the penile sheath to loosen mucus and smegma. Immediately after removal, the swabs were placed in sterile tubes of thioglycollate broth and incubated at 37°C (8). After approximately 24 hours of incubation the tubes were centrifuged at 1,500 RPM for five minutes; a one-drop sample from the bottom of the tube was placed on a glass slide and examined microscopically (100x) for motility patterns characteristic of *T. fetus*.

Results

A total of 280 bulls were examined with a total of 22 (7.8%) yielding identifiable *T. fetus*. Figure 1 illustrates the total number of bulls testing positive, by age. Figure 2 illustrates the percentage of positive bulls by breed.

Discussion

Bovine genital trichomoniasis is apparently more widespread in Oklahoma beef cattle than previously believed. In the sample population studied, prevalence appears to increase with age, being greatest in 4 (7.8%), 5 (11.6%) and 6 (14.6%) year old bulls. Hereford, Angus, and Brahmans showed the highest frequency of infection, being 5.6%, 10.3% and 14.6%, respectively. These figures may result from sample bias, and considerably more work would be required to reliably establish a specific breed predisposition.

Although the results of the present study showed a prevalence of 7.8%, this figure may be considerably lower than the actual disease prevalence. Sampling procedures have been shown to influence recovery figures (9,10). The simplified swab culture technique used in this study, although simple in application, is probably not ideal under all circumstances. Likewise, examination of animals from a single livestock market, although large in volume, may be influenced by local situations and regional ranching practices. Finally, a single test on an infected animal may not reveal evidence of infection; current recommendations are for six negative examinations at 7-10 day intervals to conclusively declare an animal free of trichomonads (11).

Infections with *T. fetus* have been shown to result in decreased reproductive efficiency through prolonged or irregular estrous cycles, repeat breeding, and abortions (12). For 1978, the estimated Oklahoma cattle population was 5,900,000 of which 2,186,000 were beef cows that had calved and 618,000 were breeding (replacement type) heifers (13). Since *T. fetus* exerts its major pathologic effect in breeding age females and especially in virgin heifers, the thrust of these remarks will be addressed to such animals. With a

Figure 1. Percentage of bulls testing positive for *T. fetus* by age class.

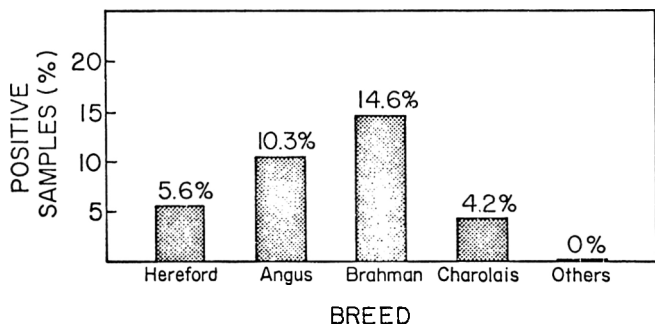
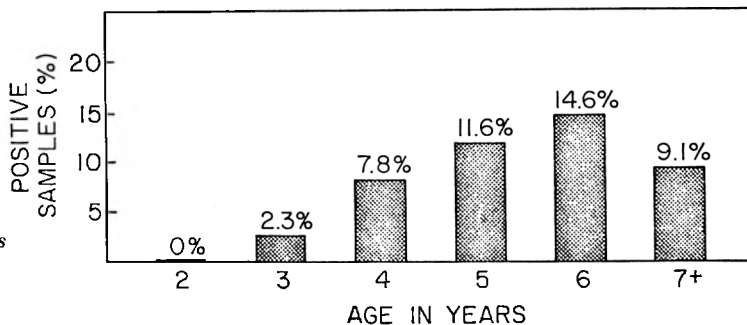


Figure 2. Percentage of bulls testing positive for *T. fetus* by breed.

prevailing infection rate of 7.8% in bulls, it is reasonable to expect the prevalence to be similar in a randomly selected population of virgin heifers. Assuming such: 48,204 heifers can be expected to experience at least a three-month delay in conception (12). Since four heifers, each with a three-month reproductive loss, constitute one heifer-year and dividing the number of infected animals (48,204) by four, one finds a total loss of 12,051 heifer-years. Anticipating a minimum calving rate of 85%, as a conservative estimate, potentially 10,243 calves are "lost" to *T. fetus* in Oklahoma each year. Although calf prices vary widely, the preliminary 1978 Oklahoma average for 400 lb. beef calves was \$241/head (14). Using that figure as a base, the *T. fetus* dollar loss in Oklahoma is \$2.5 million/year considering only replacement-type heifers which comprise only 10.5% of the state's total bovine population. If only 25% of the remaining beef females that are theoretically susceptible to *T. fetus* infection are in reality infected, the aforementioned dollar loss is doubled (\$5 million). It is important to note that this loss figure deals only with losses due to reduced calf crops and not with the management costs associated with non-producing animals. It is entirely possible that the loss (direct and indirect) due to *T. fetus* infection easily exceeds \$7 million/year in Oklahoma. The total loss figure of \$7 million/year includes an estimated \$2 million in related production costs.

Summary

The presence and importance of bovine genital trichomoniasis in Oklahoma beef cattle have not been thoroughly evaluated. The present study showed a prevalence of 7.8% in market bulls; a figure which because of a restricted sample population and a single examination procedure probably does not accurately

reflect the true prevalence of *T. fetus* in Oklahoma cattle. From the results of this study, it can be stated, however, that trichomoniasis does occur in Oklahoma and should be considered by the practicing veterinarian when confronted with bovine reproductive problems.

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