

# TIMELY INFORMATION

## Agriculture & Natural Resources

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### Trichomoniasis prevention and control

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Reproductive efficiency is one of the most important factors in determining the profitability of a cow-calf farm or ranch. A beef cow needs to produce a calf every year to be an economically viable member of the herd. Trichomoniasis is a sexually transmitted disease that can cause substantial reproductive and economic losses in cow-calf operations that use natural service. The disease is caused by the protozoan *Tritrichomonas foetus* (*T. foetus*), and is commonly referred to as 'Trich'. Bulls can become chronic, asymptomatic carriers of *T. foetus* since the organism can survive on a bull's penis and prepuce without causing any clinical signs. However, infections in cows can result in early embryonic death, abortion, pyometra (pus-filled uterus detected at pregnancy examination), or infertility, negatively impacting the reproductive performance and economic profitability of a cow-calf operation.

The first case of trichomoniasis in the United States was reported in Pennsylvania in 1932, and since then trichomoniasis has been diagnosed throughout the United States and in many parts of the world. Veterinarians throughout the U.S. are reporting more cases of trichomoniasis in recent years, perhaps as a result of increased cattle movement due to drought and other natural disasters. The increased prevalence of trichomoniasis has prompted many States to enact rules and regulations regarding the sale and movement of animals potentially infected with *T. foetus*, making prevention and control of trichomoniasis very important for every cow-calf operation.

#### ***Trichomoniasis in bulls***

Similar to most venereal diseases in domestic animals the male simply serves as an asymptomatic carrier, while the female suffers the identifiable consequences of infection. *Tritrichomonas foetus* survives in a bull's sheath on the penis and prepuce, but causes no penile or preputial lesions and does not affect semen quality or libido. Without any noticeable clinical signs it is impossible to know if a bull is infected without appropriate diagnostic tests. Most bulls become chronically infected with *T. foetus* after breeding an infected cow, and the infections rarely clear regardless of time. Despite the lack of clinical signs, bulls with trichomoniasis do tremendous reproductive damage by infecting cows and heifers during the breeding season.

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### ***Trichomoniasis in cows and heifers***

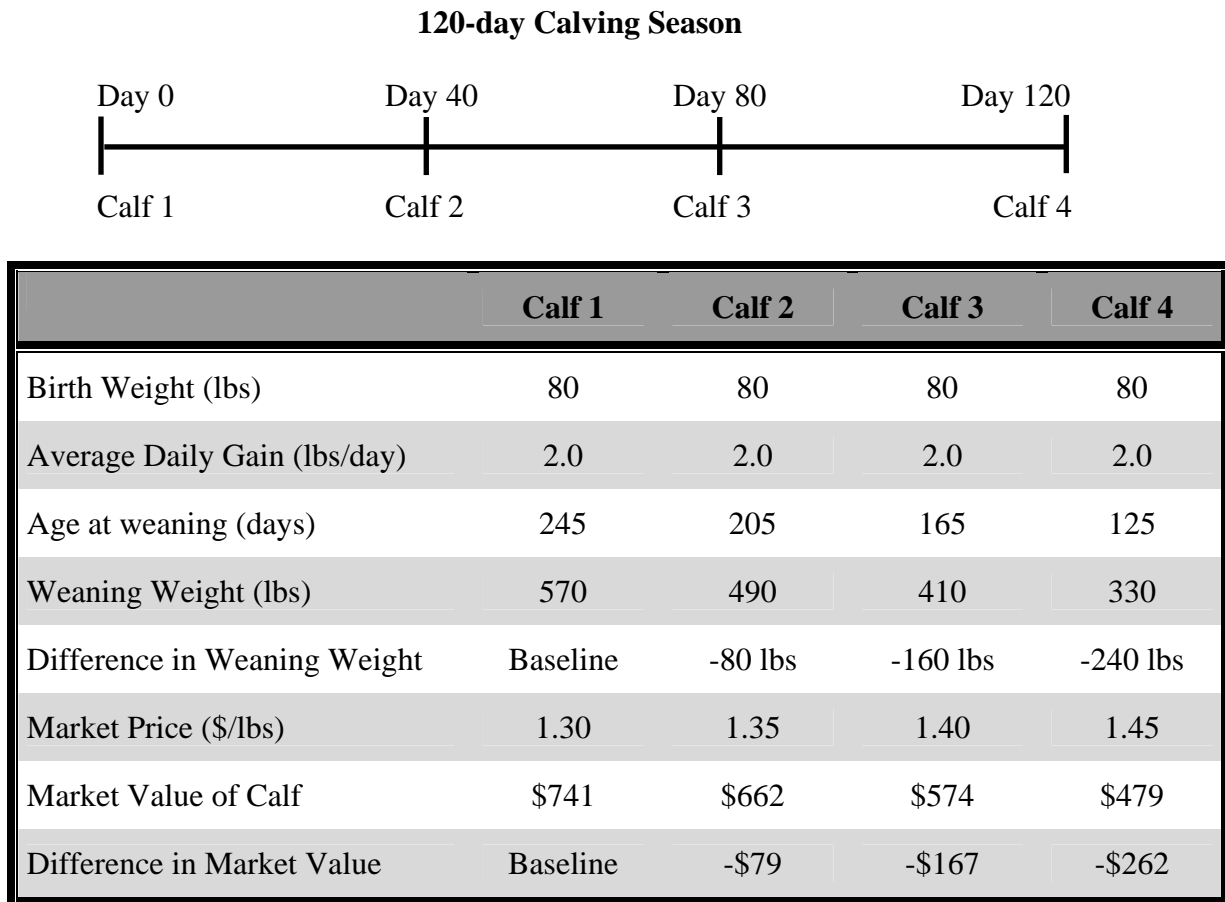
Trichomoniasis occurs in a cow after mating with an infected bull. The organism moves through the cervix during estrus and colonizes the entire reproductive tract within 1-2 weeks. Cows and heifers will rarely show a very mild vaginal discharge, but this is usually never noticed. Therefore, like the bull, there are typically no initial clinical signs that a cow or heifer is infected with *T. foetus*. Pyometra and abortion are often the first physical signs of trichomoniasis that are noticed in a herd, but these signs occur in less than 5 percent of infected animals. Infertility due to early embryonic or fetal death is the most economically damaging clinical sign and occurs in a much larger percentage of infected cows. However, often the only clinical sign associated with early embryonic death is an irregular return to estrus, which can easily go unnoticed in a large herd. Unlike the bull, the cow is capable of mounting an effective immune response to *T. foetus* and can usually clear the infection in 2 to 6 months (sometimes longer), but usually not before sustaining some type of reproductive loss.

*Trichomonas foetus* does not usually prevent conception, but as the organism multiplies in the uterus it can cause death of the embryo or fetus most commonly between gestational days 15 to 80. A small percentage of cows will abort in the second or even third trimester, and an even smaller number of cows (estimated to be about 1% or less) will maintain an infection through a normal gestation and deliver a live calf. While small in number, the few cows that maintain a *T. foetus* infection throughout gestation are very damaging because they represent a source of reinfection for the herd during the following breeding season and will absolutely wreck efforts to control the disease.

### ***So how does trichomoniasis affect a cow-calf herd's reproductive performance?***

Early embryonic death, infertility, and repeat breeding can result in long, drawn-out breeding and calving seasons. A cow in a herd with a long breeding season can become pregnant and infected with *T. foetus* early in the breeding season, lose that embryo or fetus, be infertile until she clears the initial *T. foetus* infection, rebreed, conceive, and as a result of her temporary immunity, carry a calf to term. The result is that more cows will calve later in the calving season than desired, and there is a resultant wide variety in weaning weights in addition to a reduced calving percentage. The later born calves are then marketed at lighter weights thus generating less revenue (Figure 1). Further adding to the problem is that once a cow calves late in the calving season it is just not practically or biologically possible to adjust her calving date to a more profitable time early in the season. Once a cow calves late she will continue to calve late in subsequent years, thus sacrificing valuable growing time for her calf before sale date. Less growing time means fewer pounds to sell, so a late-calving cow will produce less profit every year compared to the profit she could produce if she calved early in the season. Naïve cows exposed to *T. foetus* will most likely calve late, if they calve at all.

**Figure 1.** Differences in weaning weight and market value of calves born over the course of a 120-day calving season.



In herds with a short breeding season the consequences of trichomoniasis are usually more devastating because naïve cows typically don't have time to clear the infection, rebreed, and conceive. The result is a high percentage of open cows because it takes a cow with no immunity against *T. foetus* all, or at least the majority of, a short breeding season to clear a *T. foetus* infection. With no prior immunity to *T. foetus* a cow infected during a short breeding season will likely not deliver a calf at all, even a late calf.

With so few noticeable clinical signs of trichomoniasis it is always important to evaluate a herd's overall reproductive performance to look for any indication of a problem. Trichomoniasis should be suspected, along with several other problems, anytime reproductive performance declines in a natural service herd. In herds with new infections, the results can be devastating, with long, drawn-out calving seasons and maybe only a 50-70% calf crop. In herds where trichomoniasis has gone undetected for a period of time, the results may be less dramatic because of temporary herd immunity. In such cases, the calf crop may only be reduced 5-10%; however, this loss is still enough to have a substantial economic impact on feeder calf breakeven price and profit per brood cow (Figure 2).

**Figure 2.** Feeder calf breakeven price per pound and profit per brood cow for various weaning percents. Assumes an annual calf production cost of \$500 per brood cow and an average calf market price of \$1.35/lbs.

Weaning Weight (lbs/calf)	Weaning Percent	Pounds Weaned per Exposed Cow (lbs/cow)	Feeder Calf Breakeven Price		Profit per Brood Cow	
			(\$/lbs)	(\$/lbs)	(\$/head)	(\$/head)
500	95%	475	\$1.05	Baseline	\$141	Baseline
500	90%	450	\$1.11	-\$0.06	\$108	-\$34
500	85%	425	\$1.18	-\$0.12	\$74	-\$68
500	80%	400	\$1.25	-\$0.20	\$40	-\$101
500	75%	375	\$1.33	-\$0.28	\$6	-\$135

***Economic impact***

The economic impact of trichomoniasis is due to three factors: (1) loss of calf crop due to early embryonic loss or abortion; (2) loss of income due to lighter weaning weights resulting from delayed conception and late calving (since calves are born later in the season and then sold at lighter weights); and (3) culling of open cows and infected bulls along with the costs of replacing valuable breeding stock.

***Treatment***

Trichomoniasis is usually self-limiting in cows and heifers as they typically clear the infection in 2 to 6 months (although usually not before sustaining some type of reproductive loss), as opposed to bulls that typically become chronically infected. Unfortunately, one of the complicating factors associated with bovine trichomoniasis is that there are currently no effective treatments with Food and Drug Administration approval. Therefore, infected bulls must be culled and sold for humane slaughter. The lack of effective approved therapies for trichomoniasis emphasizes the need for appropriate prevention and control measures through education, testing and culling of infected bulls, vaccination, and a variety of herd management practices.

***Prevention and Control of Bovine Trichomoniasis***

Prevention and control of trichomoniasis focuses on herd management and biosecurity to reduce the likelihood of infection or decrease the level of exposure while using vaccination to increase resistance in the event exposure does occur. Not all recommendations are practically feasible or necessary based on geographic and production realities, but use these recommendations as a point of reference to improve herd health protection and understand your vulnerabilities:

1. Avoid grazing cattle on public lands where both bulls and cows have a much greater risk of exposure through mating with other *T. foetus* infected animals.

2. Utilize artificial insemination when possible. Very rarely is *T. foetus* ever transmitted by contaminated semen or artificial insemination (AI) equipment, especially if semen is purchased from reputable AI studs and used with hygienic AI techniques. Reputable AI studs have strict biosecurity and quality control measures in place to ensure that their bull semen is not contaminated with *T. foetus*. So, AI using hygienic techniques with bull semen from a reputable source is an excellent way to prevent the introduction of *T. foetus*, although AI may not be practical in larger herds.
3. Use a 60-90 day breeding season. Cull all cows and heifers that are not pregnant after the breeding season. A long breeding season not only allows propagation of *T. foetus*, but it may also hide production losses due to reduced weaning weights because of delayed conception.
4. Control animal movement into a herd. Maintain good fences to prevent *T. foetus* infected animals from inadvertently entering a herd, or to prevent uninfected animals from temporarily entering a *T. foetus*-infected herd and then returning with *T. foetus* to the clean herd.
5. Purchase virgin bulls and heifers as replacements. Buying older bulls and cows as replacements greatly increases the chance of purchasing a *T. foetus*-infected animal. While older bulls are much more likely to become chronically infected with *T. foetus* than cows, a small percentage of cows will also become chronically infected. If older animals are purchased, then at the very least only purchase replacement breeding stock from herds known to be free of *T. foetus*.
6. Test all bulls for *T. foetus* at least once before introducing them into a new herd. The test should be performed after two weeks of sexual rest. Ideally, a bull should have three negative cultures at weekly intervals. Cull all infected bulls for humane slaughter only. Maintain as young a bull battery as possible. Older bulls are much more likely to be chronically infected with *T. foetus*. Vaccination of bulls with TrichGuard® and TrichGuard® V5L may be helpful in keeping bulls free of infection. In a recent trial, bulls vaccinated against *T. foetus* resisted colonization and produced antibodies against *T. foetus* in preputial secretions and serum.
7. Breed purchased cows and heifers in a separate herd. Cull all the cows and heifers that are not pregnant after the breeding season. Ideally, continue to keep the pregnant animals segregated from the rest of the herd through the next breeding season.
8. Culture all pyometras diagnosed in cows or heifers during pregnancy examinations.
9. Submit all aborted fetuses and placental tissue to a diagnostic laboratory.
10. Herds that lease bulls are at greater risk for introduction of diseases such as trichomoniasis. However, the benefits of leasing bulls by not having to maintain a bull battery year-round may outweigh the risks for some farms. Many reputable farms that have bulls available for lease regularly test for trichomoniasis. However, with the limited

accuracy of the diagnostic tests we have available today it is unreasonable to expect the owner of a leased bull to guarantee bulls free of *T. foetus* infections. Therefore, you must accept some risk and responsibility when leasing a bull. If the risk of leasing a bull becomes too high then consider buying a bull. Many of the farms that lease out bulls also have good bulls for sale.

11. Vaccinating all breeding age females against *T. foetus* will raise a herd's immunity and reduce the duration of infection and therefore mitigate the reproductive wastage caused by *T. foetus*. Vaccination is essential in herds with high-risk of exposure to trichomoniasis to promote the development of immunity (disease resistance) against *T. foetus*. Failure to vaccinate high-risk herds will increase the likelihood of serious negative reproductive and economic consequences following infection of naïve cows and heifers with *T. foetus*. Vaccination is highly recommended for herds at moderate-risk of exposure to trichomoniasis, and should be used in low-risk herds if temporary lapses in biosecurity occur or are expected. TrichGuard® and TrichGuard® V5L are the only vaccines available in the United States that protect against *T. foetus*. The vaccines require an initial subcutaneous dose followed by a booster dose two to four weeks later. The second injection should precede the breeding season by 4 weeks. Annual revaccination four weeks prior to the breeding season is recommended.

Talk to your Regional Animal Science and Forages Extension Agent and your veterinarian about trichomoniasis. If you suspect trichomoniasis in your herd, contact your veterinarian for a thorough investigation.