

Keeping Mastitis out of your herd may improve reproductive success

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Mastitis in your herd may be costing you more money than you think, suggests a study linking mastitis and poor reproductive performance in dairy cows.

The average clinical mastitis case costs you, the producer, an estimated \$150. This figure accounts for economic losses from discarded milk, antibiotic treatment, decreased lactation production and your time managing the treated animal. However, mastitis costs may go deeper than these obvious losses. Udder infections may be hampering your herd's reproductive success.

University of Tennessee researchers have investigated how clinical and subclinical mastitis affect reproduction measures. They analysed data gathered over a 10-year period from 758 Jersey cows in their research herd. The microbiological data was from quarter milk samples collected from lactating cows every four to eight weeks. Researchers defined subclinical mastitis as a cow with two consecutive milk cultures containing the same organism. Milking personnel identified clinical cases. Milkers practised teat dipping and used antibiotic therapy at dryoff and to treat clinical cases. Personnel measured reproductive performance by days to first service, days open and services per conception.

Researchers divided data into groups. The cows with mastitis before first service (374) showed a significant increase in days to first service, days open and services per conception compared with cows with no mastitis or a case developing after pregnancy (326). The result was the same for clinical and subclinical mastitis.

The 35 cows with clinical mastitis between first service and confirmation of pregnancy had a significant increase in days open and services per conception compared with cows with subclinical cases or no mastitis (see Table 1). Cows with prolonged udder infections (subclinical infections that eventually became clinical cases during the breeding period) were most severely affected for the three reproduction parameters. The reliability of the results may be questionable because this group had only six cows. Nonetheless, the impact on reproduction was large and deserves attention.

Table 1. Effect of mastitis in cows between first service and confirmed pregnancy on reproductive parameters.

Mastitis case group	Number of Cows	Days to 1st service	Days open	Services per conception
No mastitis or mastitis after pregnant	326	67.8	85.4	1.6
Subclinical	11	61.2	90.9	2.1
Subclinical progressed to clinical	6	93.9	196.0	4.3
Clinical	35	70.6	143.6	3.0

Research often provides answers while leading to more questions. Scientists don't fully understand the link between mastitis and reproductive performance. Some work has shown a cow's response to mastitis caused by gram-negative pathogens (like E. coli and Klebsiella) has a negative effect on its hormonal profile and follicular development. Other studies suggest that prostaglandins are released in the inflammatory response to gram-negative infections. This prostaglandin increase acts similar to a prostaglandin injection, which can change the length of a cow's heat cycle and may cause the loss of a developing embryo in a bred cow. In the Tennessee study, gram negative and gram positive bacteria caused clinical mastitis equally-here, the type of bacteria had no bearing on results.

These suggested mechanisms of mastitis affecting reproduction seem plausible for cows contracting an udder infection during the breeding period. However, researchers are more skeptical about mastitis' negative effects on reproductive performance for the cows that develop mastitis early in lactation. More research is needed to understand this relationship.

Some aspects of the Tennessee study may affect its relevance for Ontario producers. Ontario's dairy population is over 90 per cent Holstein, so a Jersey herd study's relevance may be questioned. Nevertheless, a study conducted on the University of Florida Holstein herd to evaluate clinical mastitis and reproduction reported similar results. However, the warmer climate and different feeding programs used in the southern U.S. may decrease the relevance of this study to Ontario dairy herds.

Nonetheless, study results stress the importance of striving to control udder infections in your herd. There are the obvious direct costs of clinical or subclinical mastitis, but there's growing evidence of the indirect cost of reproductive inefficiency. Three U.S. research studies have reported that the estimated cost of each day open after 90 days ranged between 50 cents and \$4.00 US. The importance of managing your herd to prevent mastitis in the first 60 days of lactation is obvious, but mastitis control needs to remain a top priority right through a cow's breeding period and beyond.

Given the potential economic importance of these research findings, following a mastitis control program would benefit your bottom line. One program, recommended by the National Mastitis Council (NMC), includes 10 steps that involve all areas that may affect mastitis in your herd. (see Table 2 below)

Setting udder health goals and monitoring them regularly basis is an important first step. Proper stall maintenance and adequate bedding will keep teats clean and dry in between milkings. Keeping the maternity area clean and well bedded will protect fresh cows from udder infection during their most vulnerable period. Good udder preparation practices prior to milker attachment are important. Applying the milker to clean and dry teats is a must.

Record keeping is extremely important for monitoring clinical mastitis trends in your herd. Prior to treating a clinical mastitis case, collect a milk sample of the infected quarter and submit it for bacteria identification. This information can be used to determine a bacteria profile for your herd, which can help identify management practices that may need attention. With the help of your veterinarian develop treatment strategies that are appropriate for the mastitis cases in your herd.

Using dry cow antibiotic therapy after the last milking is important to help cure existing udder infections and prevent new infections in the early dry period. Using alcohol swabs to prepare teats prior to dry cow treatment is important to avoid contaminating the udder with bacteria from the outside of the teat. Enrolling in an individual cow somatic cell count program can help detect subclinical mastitis before it becomes a clinical mastitis problem.

Your veterinarian and DFO's udder health specialists are excellent resources who can advise you on developing and implementing a mastitis control program for your farm. The benefits of implementing sound practices to control mastitis go further than a decreased incidence of the disease. Increased reproductive performance in your herd is another benefit that is becoming more evident.

Table 2. NMC recommended 10-step mastitis control program

- 1.** Establish udder health goals for your herd
- 2.** Maintain a clean, comfortable environment
- 3.** Use proper milking procedures
- 4.** Properly use and maintain your milking equipment
- 5.** Keep good records
- 6.** Manage clinical mastitis appropriately during lactation
- 7.** Use effective dry cow management
- 8.** Use biosecurity protocols to prevent the spread of contagious pathogens and when marketing chronically infected cows
- 9.** Monitor your herd's udder health status regularly
- 10.** Periodically review your mastitis control program