

Mastitis Control Program
for
Prototheca Mastitis in Dairy Cows

by

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INTRODUCTION:

Prototheca are colorless algae that can cause mastitis in dairy cattle. They are widespread in housing areas, pens and pastures used by dairy cattle. Most infections are clinical and remain as chronic infections.

Where can prototheca be found on the dairy?

Prototheca are often associated with wet areas containing decaying manure and plant matter. They can also be found in flowing water, standing water, water tanks, water runoff from silage, well water, milking parlor wash water, manure, teat dip containers, milking machine liners, teat end swabs and feed troughs. These algae have also been isolated from feces of rats trapped on dairies. Prototheca have been isolated from environmental sites on dairies that have cows infected with prototheca and dairies that do not have mastitis caused by prototheca. This indicates that prototheca are widely dispersed in the environment of dairy cows on both dairies with and without prototheca problems.

How do prototheca infections develop and spread within the dairy herd?

Prototheca infections are thought to occur when the teats of cows are exposed to high populations of algae in environmental sites during the intervals between milkings. Spread during milking time is not significant. However, new prototheca infections can occur in situations where a high percentage of cows are infected with prototheca and milking techniques are poor.

How widespread can a prototheca problem be within a dairy herd?

The reported level of infection within dairy herds is from 4 to 40% of milking cows. In most herds few, if any, cows are infected. Herd outbreaks with greater than 10% of cows infected are rare. Prototheca can be detected in bulk tanks in many cases. The presumed infectious dose of prototheca relatively is high compared to other mastitis pathogens.

This accounts for the sporadic nature of new infections caused by prototheca as the mammary gland is in constant contact with water sources on the dairy. All stages of lactation appear to be equally susceptible to new infections including dry cows.

What are the results of prototheca infections?

Most mammary infections with prototheca are clinical with the milk being grossly abnormal but without severe systemic signs such as off feed, depression or a high fever. Non-clinical outbreaks have been marked by normal milk with many quarters or cows with SCC greater than 1,000,000. In addition, most cows with protothecal infections will have reduced milk production.

What is the effect of prototheca infections on milk quality?

Milk from cows with prototheca mastitis can be anticipated to have elevated somatic cell counts to the point that the bulk tank milk may also be elevated. The standard plate count for the herd may also be elevated. Due the detrimental impact of prototheca infections on milk quality and lack of response to treatment, culling is advised for known infected cows.

How can I recognize prototheca infections within my dairy herd?

- Prototheca mastitis should be suspected when non-responding clinical cases of mastitis occur.
- Milk culture of cows with prototheca mastitis will yield isolation of typical algae using standard laboratory procedures as recommended by the National Mastitis Council.
- When numerous cows are infected, the bulk tank somatic cell count may become elevated above 400,000 cells/ml.

What should I do if I have prototheca infections within my herd?

- Prototheca are widely dispersed within the dairy environment. It will not be productive to attempt to locate the environmental site of prototheca by culturing environmental sites. Finding prototheca in the environment does not mean the source of infection has been located. The cost of specialized isolation techniques necessary to culture prototheca from highly contaminated sites is usually prohibitive.
- Cows should be kept out of obvious wet areas particularly those with decaying manure or plant matter. In some cases, no obvious site may be present. A few outbreaks have occurred on arid Western dairies. These outbreaks occur in most cases during periods of warm weather with high rainfall when teat-end exposure is extreme. Use of sprinkler pens, flush alleys and cooling misters do not appear to increase the risk of new prototheca infections.

- Cows identified on culture as being infected with prototheca should be clearly identified and milked last in the milking order until they can be culled.
- All cows with elevated cell counts ($> 400,000$ cells/ml) should be identified and cultured for prototheca when prototheca has been identified as a mastitis-causing organism in your herd. Prototheca-positive cows should be culled. Early detection and culling of infected cows will protect bulk tank milk quality, decrease milk discard and reduce frustration due to treatment failures.
- Unfortunately, there is no easy solution to dealing with prototheca infections. Thankfully, most infections are sporadic in nature and culling is the best policy.

Should I attempt to treat cows with prototheca infections?

The algae that are responsible for protothecal mastitis infections is not susceptible to antibiotic treatment. Therefore, no treatment for prototheca should be attempted with antibiotics. Most prototheca infections quickly become entrenched in the mammary gland and develop into long-term chronic infections. The infections may persist across dry periods and last for several lactations.

This is one in a series of bulletins on mastitis control in dairy cows and herds.

Contact your county Cooperative Extension Service office for information on other forms of mastitis and how to develop prevention and control programs for them.