

7 Point Plan for Mastitis Control

A proposal

Over the past 40 years, since the adoption of the 5 Point Plan for Mastitis Control, there has been a significant reduction in the number of clinical cases of mastitis, in levels of bulk tank somatic cell counts and in the prevalence of mastitis caused by contagious bacteria.

The graphs below show data for the United Kingdom, but similar trends in the control of mastitis are evident in all countries where the 5 Point Plan was implemented.

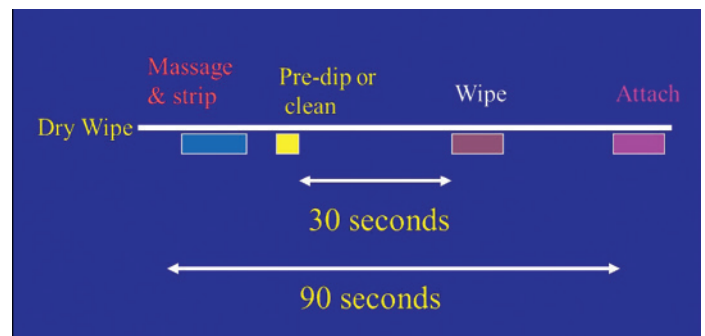
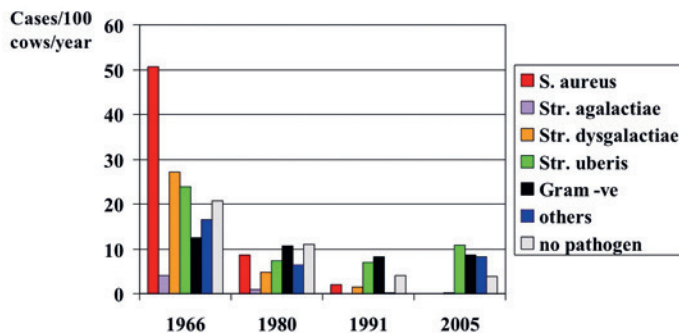
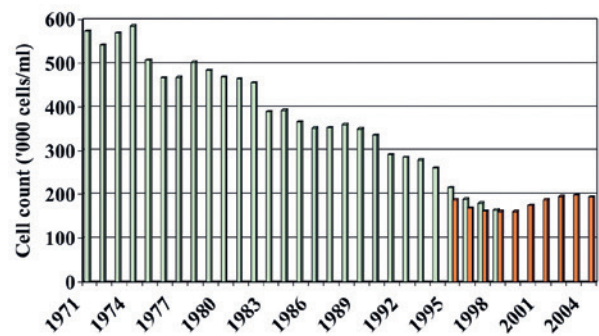
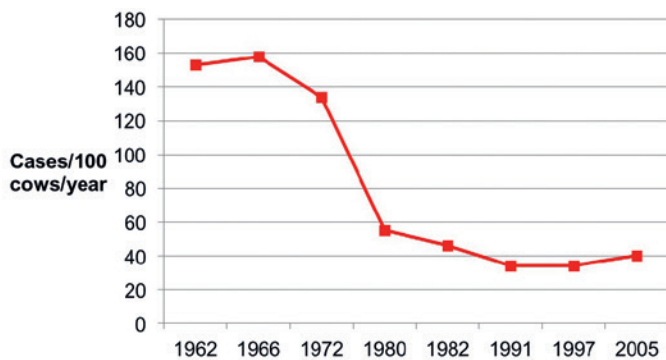
1. Disinfect all teats after every milking
2. Treat all cases of mastitis promptly and record data
3. Use dry cow treatment on all cows
4. Cull all cows with three or more cases
5. Maintain the milking machine properly

In spite of the success of the 5 Point Plan, mastitis to-day, remains the most costly disease on dairy farms globally, with a cost of \$250 – \$450 per clinical case and an annual cost estimate of over \$2 billion in the United States alone. We find today that contagious mastitis has been replaced largely with mastitis from environmental bacteria. We also find

that because of concerns about resistance and residue, antibiotic usage, especially prophylactic use at dry off is, or will be, severely limited. We have also seen over the past 40 years a greater understanding of the immune system, with numerous technologies developed to enhance immunity and reduce the risk of mastitis. As a result of these developments, we propose to revise the Plan to a 7 Point Plan for Mastitis Control. We keep or modify the current 5 points and add 2 new areas of focus.

1. Disinfect all teats after every milking

Post milking teat disinfection remains a foundation for the prevention of contagious mastitis. The effectiveness of the various products offered is well documented in the scientific literature. The reduction in mastitis rates for post milking teat disinfection has been shown to be 40% or greater with results approaching 100% in some studies. A broad range of germicides has been shown to be effective, with iodine being the most widely studied. Other germicides with efficacy proven in clinical trials include chlorine dioxide, hydrogen peroxide, lactic acid, glycolic acid and chlorhexidine. Given the wide range of choices, dairy farms can choose germicides, such as iodine, hydrogen peroxide, lactic acid or glycolic acid, that are naturally present in milk. Post milking teat





disinfectants that possess barrier properties can help reduce environmental as well as contagious mastitis.

2. Treat all cases of mastitis *once the bacteria are determined and record data*

Antibiotic treatments remain an important animal welfare tool for curing cases of mastitis, returning the cow to full production and reducing the spread of contagious diseases. However, most lactating cow antibiotics are effective only against gram positive bacteria, and *S. aureus* is often resistant to a successful treatment outcome. With the concerns about the overuse of antibiotics in animal health, it is prudent to treat mastitis (both clinical and subclinical) only after the causative bacterium is identified. This would not only reduce antibiotic use, but would also reduce the amount of milk withheld from the bulk tank because of antibiotic withdrawal. The success of this approach would be facilitated by the expansion of on-farm bacteria identification (bi-plate, tri-plate) and the development of new rapid tests that identify bacteria within 12 hours. If results were available between milkings, then withholding treatment should not be an issue.

3. Use dry cow teat sealant on all cows and selectively use dry cow therapy

Blanket dry cow therapy has proven effective for curing existing clinical and sub-clinical infections and in reducing infections during the dry period. Until this time, it was cheaper for a farmer to treat than to test to determine the udder infection status of every cow at dry off. With concerns of antibiotic overuse, prophylactic use is no longer allowed in some countries and is not advisable anywhere. Teat sealants, whether internal or external, have been shown to provide good protection against new dry period infections. Consumer pressure will continue to increase and it is only a matter of time before consumer demand or regulations will prohibit prophylactic antibiotic use. Schemes for selective dry cow therapy have been implemented in The Netherlands for example with a substantial reduction in antibiotic use and without an increase in dry period infections.

4. Cull all cows with three or more cases

This recommendation remains prudent as cows with multiple clinical cases remain reservoirs for infection of contagious bacteria. Data continue to show that *S. aureus* is often untreatable with antibiotics. Any chronically infected cow is a source of infection and, with a likely reduction in milk production, should be removed from the herd.

5. Maintain the milking machine properly

The milking machine remains a point of transfer of contagious bacteria from infected to non-infected cows. With the increase in herd size, 24-hour milking, and robotic milking, we often have a substantial increase in the number of cows milked per day in the same milking point. Transfer of contagious bacteria is therefore potentially higher than at the time when the 5 Point Plan was introduced.



Tom Hemling proposes a 7 Point Plan for Mastitis Control. He keeps and modifies the current 5 points and adds 2 new areas of focus.

6. Milk a clean, dry, and disinfected teat (new feature)

With the control obtained on contagious bacteria, mastitis from environmental pathogens is the dominant problem in many herds. Effective pre-milking hygiene reduces both mastitis risk and helps reduce bacterial contamination of the milking system and the bulk tank. The pre-milking routine should include fore-stripping for stimulation and detection of abnormal milk; cleaning; disinfecting; and wiping of the teat prior to attachment of the cluster. This procedure results in a clean, dry, disinfected teat and allows for good milk let-down and rapid milk flow. Cleaning or disinfecting agents should be registered for use in this application, and materials used should be approved for food contact. Disinfectants should be selected from those naturally present in milk (iodine, hydrogen peroxide, lactic acid, glycolic acid). The benefit of pre-milking disinfection is documented in numerous studies and research has shown a low risk of milk residues when proper procedures are used.

7. Use nutrition, stimulants and vaccines to improve immunity (new feature)

Stimulation of a cow's own immunity is an effective option for reducing mastitis risks. Vaccines for coliform mastitis have proven effective at reducing the symptoms of mastitis and recently vaccines for *S. aureus* mastitis have shown good results. Nutritional optimization can provide protection against mastitis, and the benefit of trace minerals and vitamins (selenium and tocopherol) are well documented. Novel immune stimulation or restorative treatments (for example pegbovigrastim) have been shown to provide protective benefits.

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5. Maintain the milking machine properly
6. Milk a clean, dry and disinfected teat
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