

Biosecurity Practices to Limit Spread of *Staphylococcus aureus* on Ontario Sentinel Dairy Farms

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Introduction

From May 1997 to December 1998, 40 dairy veterinarians from across the province, and 60 of their dairy producer clients, participated in the Sentinel Herd pilot project. Composite milk samples from all lactating cows in each herd were collected and cultured every 4 months. A milking and management questionnaire was administered to each participating producer at the time of the initial herd culture. Several questions pertaining to the herd's biosecurity practices were included. Based on the first 4 rounds of herd cultures, only 4 herds did not have any cows from which *Staphylococcus aureus* (HS) was isolated (negative herds). Three herds had positive cows on 1 herd culture and 6 herds had positive cows on 2 herds cultures. Fifteen herds were positive 3 times and 32 herds, all 4 times. As HS has been shown to be present in most of these herds, it is likely that many herds run a great risk of introducing this infection at some time. Therefore, it is of importance to examine the factors that appear to control it within a herd, once introduced.

Results

Hygiene at milking time is important for reducing the spread of contagious mastitis pathogens such as HS

within the herd. Pre-milking practices for the 60 herds and distribution of these practices in relationship to the frequency of positive herd results are in Table 1. To examine the relationship of these practices to HS infection, pre-milking practices were categorized as "acceptable" (wash, dry and pre-dip; wash and dry; pre-dip and dry) or "unacceptable" (dry wipe; wash only; no prep; or use of "baby wipe" products). Unacceptable and acceptable practices were evaluated for their association with low (0, 1, or 2 herd cultures positive) or high (3 or 4) prevalence of HS. The Pearson's Chi-square was 2.65 ($p=0.10$). Initial analysis suggests that a relationship between udder prep and the spread of HS in these herds exists and should be examined further.

Post-milking teat disinfection is intended to prevent colonization of teat skin with HS at milking time. All but 2 of the 60 herds applied disinfection in some fashion after milking. The methods of application by the 58, and a comparison to the frequency of positive herd culture results, are presented in Table 2. No comparison to no-dipping can be made in this study because there are too few "control" (non-disinfected) herds. Interestingly, both non-disinfecting herds had at least one positive cow at each of the 4 herd cultures.

Other practices, such as establishing a milking order based on the udder health status of cows in the herd, have been shown to be an effective and practical

Table 1. Frequency of pre-milking practices and their association with frequency of positive herd culture for *Staphylococcus aureus*

Number of Positive Herd Cultures	Dry Wipe	Wash, dry and pre-dip	Wash and dry	Pre-dip and dry	Wash only	Pre-dip and wet cloth	No prep	"Baby Wipes"	Total
0	0	1	2	1	0	0	0	0	4
1	0	0	1	1	0	1	0	0	3
2	1	0	2	3	0	0	0	0	6
3	2	0	5	7	0	0	1	0	15
4	5	0	8	12	2	0	1	3	31
TOTAL:	8	1	18	24	2	1	2	3	59

Table 2. Teat disinfection method versus frequency of *Staphylococcus aureus*-positive herd cultures.

Number of Positive Cultures	In-line spray	Hand-held spray	Dip	Total
0	0	0	4	4
1	0	1	2	3
2	0	0	6	6
3	0	2	13	15
4	3	2	24	29
TOTAL:	3	5	49	57

means of reducing the spread of contagious mastitis within the herd. While 12 and 36 responders felt their herds likely contained cows infected with *Streptococcus agalactiae* and *Staphylococcus aureus* (before any project culturing was done), only 28 herds reported that mastitis affected the milking order of the herd.

Conclusions

From the information collected to date, it is clear that HS udder infection is common in Ontario herds. Effective within-herd biosecurity practices are lacking in many herds, and are of poor quality in others. There is a need to focus on these issues in farm-level extension programs.