

# The Mastitis Situation in Canada

One of the first projects initiated by the Canadian Bovine Mastitis Research Network (CBMRN) was an assessment of the current mastitis status of Canadian dairy farms. The objectives of this study were:

1. to estimate the incidence rate of clinical mastitis (IRCM) and identify the bacteria responsible;
2. to determine the risk factors associated with mammary gland infections;
3. to examine the rate of adoption of recommended mastitis preventative management practices;
4. to determine the prevalence of mastitis pathogens within herds.

Here is a summary of the results of that research.

## Incidence of clinical mastitis

Among the 116 dairy herds from all 10 provinces that participated in the study, 3,077 cases of clinical mastitis were recorded. The overall average IRCM was 22 cases per 100 cow-years but the rate varied from 0 to 97.4 among herds. Other significant findings included the following:

- No association was found between IRCM and bulk tank somatic cell counts (see graph below).
- The most frequently isolated pathogens from clinical mastitis were *Staph. aureus*, *E. coli*, *Strep. uberis*, and coagulase-negative staphylococci.
- Herds in tie-stall barns had the highest incidence of *Staph.* and *Strep. uberis* infections; those in free stalls had more *E. coli* infections.
- Herds in Ontario and Québec had the highest IRCM; those in the west had the lowest. This was

possibly associated with the different barn types that predominate in each region.

- *E. coli* infections were higher in Ontario than in other regions; *Strep. dysgalactiae* was highest in Québec.

## Mastitis risk factors

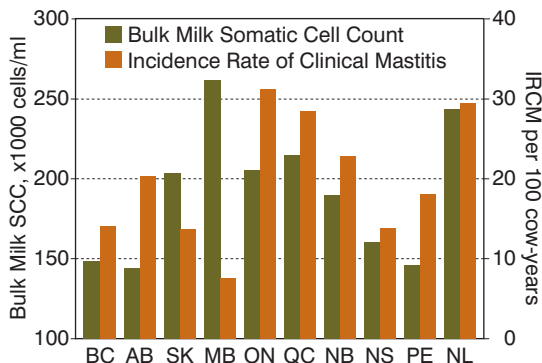
This part of the study examined associations between farm management practices and IRCM. Several practices were identified as risk factors:

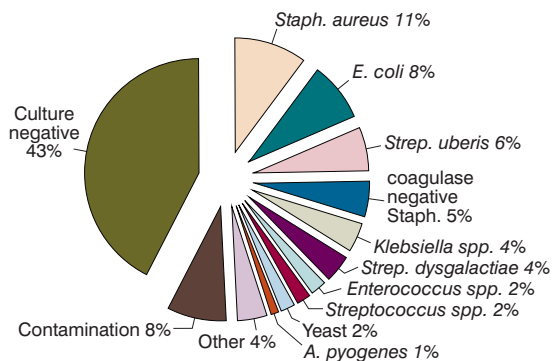
- Blanket dry cow treatment, average dry period longer than 60 days, reduced feed energy levels more than 7 days before dry-off, and reduction of water intake shortly before dry-off were all associated with lower *E. coli* IRCM.
- Herds that used sawdust or shavings as bedding had lower *Strep. uberis* IRCM compared with herds that used straw.
- When cows with a *Staph. aureus* infection were milked last or with a separate milking unit, herds had a higher *Strep. dysgalactiae* IRCM.
- Herds that segregated cows with high somatic cell counts had higher coagulase-negative staph IRCM.
- Attitudinal risk factors, such as writing down milking procedures (standard operating procedures) were associated with lower overall IRCM.
- Checking first streams of milk was associated with higher overall IRCM and more specifically with *Staph. aureus* and *Strep. dysgalactiae* IRCM, most likely because more cases of clinical mastitis were detected.

## Adoption of recommended practices

Do herds that use recommended mastitis prevention practices have a lower IRCM? Here's what a survey of 289 farms revealed:

- Adoption of most of the recommended mastitis management practices is high in Canadian dairy herds.
- Pre-milking teat disinfection, wearing latex gloves during milking, vaccinating cows for mastitis and using a computer for herd management are more common in free-stall than in tie-stall herds.





- Blanket dry cow treatment, believing that a nutritionist is important in mastitis data review, having a feed company nutritionist balance the ration, and having the lactating cow ration balanced at least twice a year were management practices associated with a lower probability of isolating *Staph. aureus*.
- Having the milking equipment checked by an independent technician at least once a year and rubber mats or mattresses in the stalls were associated with an increased probability of isolating *Staph. aureus* from the bulk tank.

## The prevalence of mastitis pathogens

Which mastitis bacteria are most frequently found in bulk milk on Canadian farms?

- *Staph. aureus* is present in bulk tank milk of nearly all Canadian dairy farms. The highest prevalence was found in Saskatchewan (90%), followed by the Atlantic provinces (86-88%).
- British Columbia had the lowest prevalence of *Staph. aureus* in bulk milk and the lowest bulk tank somatic cell counts.
- *Strep. agalactiae* may be, except in Québec, at the brink of extinction in Canada. It was found in less than 1% of bulk milk samples.
- No *Mycoplasma* species were isolated but this may have been due to frozen samples. A few were later found in fresh samples from PEI.

The pie chart above shows the frequency with which specific pathogens were cultured from 3,024 bulk milk samples collected across the country.

source: R. Olde Riekerink, PhD Thesis, Atlantic Veterinary College, University of Prince Edward Island

## What is the Canadian Bovine Mastitis Research Network?

Mastitis remains the most costly infectious disease for the Canadian dairy industry, resulting in production losses, reproductive impairment and premature culling of cows. In addition, pasteurization-resistant enzymes produced by bacterial and somatic cells in raw milk have negative effects on dairy product shelf life and quality.

Initiated by Québec dairy farmers in 2001, the Canadian Bovine Mastitis Research Network (CBMRN) has grown to include researchers across the country who share the goal of reducing the incidence of mastitis on Canadian dairy farms.

One of the key achievements of CBMRN to date has been the establishment of a Core Research Platform (CRP). The primary goal of the CRP is to improve the collection of on-farm mastitis data through the establishment of:

- 1) The National Cohort of Dairy Farms—a network of 91 farms across Canada which have agreed to share their data with CBMRN researchers.
- 2) The Mastitis Laboratory Network—a country-wide network of diagnostic laboratories that have developed and adopted standard operating practices for identifying bacterial pathogens in milk samples.
- 3) The Mastitis Pathogen Culture Collection—a centralized collection of preserved cultures of mastitis pathogens isolated from Canadian farms which will allow for in-depth study of their characteristics, leading to the development of more effective vaccination and treatment strategies.

Through support received from dairy farmer organizations and government sources, CBMRN is funding several research projects including:

- Investigating mastitis occurrence and monitoring new infections;
- Identifying genes that enable bacteria to infect the mammary gland;
- The use of genetic profiling to identify cows who are more resistant to infection;
- The role of milk proteins in mastitis resistance;
- The development of new mastitis vaccines.

source: CBMRN Annual Report, 2006-07