

# Antimicrobial Stewardship and Udder Health on Dairy Farms

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Antimicrobial use drives the emergence and selection of antimicrobial resistant bacteria. To combat antimicrobial resistance to commonly used antimicrobial treatments, we must enhance the rational use of antimicrobials in humans and animals.



## Key Points

Udder health is an important area to target for reducing antimicrobial use on dairy farms

Using a protocol for selective treatment of non-severe cases of clinical mastitis and a protocol for selective dry cow therapy can reduce the use of antimicrobials

Talk to your veterinarian about protocols for selective clinical mastitis treatment and selective dry cow therapy

**The Canadian Dairy Network of Antimicrobial Stewardship and Resistance (CaDNetASR) is a national surveillance program developed to measure antimicrobial use and resistance on Canadian dairy farms and guide antimicrobial stewardship practices.**

## What are the important findings from CaDNetASR?

Fecal samples were analyzed to look for *E. coli* (generic strain), *Campylobacter* spp., and *Salmonella* spp. These three bacteria were commonly found on dairy farms and showed resistance to tetracycline.

**When comparing antimicrobial use across CaDNetASR farms, researchers saw a high amount of variability regardless of differences in disease incidence.**

This finding suggests there is an opportunity to strategically reduce antimicrobial use on some Canadian dairy farms. To ensure long-term sustainability, CaDNetASR was developed as a component of an existing government system for on-farm antimicrobial surveillance. This allows the dairy industry to continue to monitor antimicrobial use and resistance.

## What can dairy farms do to reduce antimicrobial use?

Udder health is an important target area for the reduction of antimicrobial use, as mastitis treatments and dry cow therapy are responsible for the majority of antimicrobial use on dairy farms.

### Selective dry cow therapy

With advancements in udder health over the last decades, as indicated by a considerable decrease in bulk tank SCC, and the introduction of teat sealants, blanket dry cow therapy is no longer necessary on all dairy farms.

Using a selective dry cow therapy protocol can reduce antimicrobial use and costs on farms. Selective dry cow therapy avoids treating every cow at dry off with a long-acting antimicrobial. Instead, cows with udder infections who will benefit from antimicrobials are selected for treatment. Selective programs can be implemented without negatively affecting udder health or milk production. Criteria for selection can be implemented at the herd, cow, or quarter level and can include: using SCC thresholds, clinical mastitis history, identification of bacteria present, or a combination of criteria.

**The CaDNetASR data showed selective dry cow therapy was used by 1/3 of farms.**

For farms using selective dry cow therapy, the mean antimicrobial coverage (i.e., the percent of the herd that received antimicrobials at drying off) was approximately 50%, but this ranged from 3 to 97% of the herd.

## What are the important considerations for selective dry cow therapy?

- ⊖ Selective dry cow therapy is not the correct choice for every farm
- ⊖ Farms considering selective dry cow therapy should have an annual bulk tank SCC less than 250,000 cells/ml, have good clinical mastitis records, and low percentage of cows with contagious mastitis (e.g. *S. aureus*)
- ⊖ Access to frequent SCC records is needed to develop criteria for selecting cows. Alternatively, milk samples can be analyzed to identify active infections.
- ⊖ Use teat sealant in all quarters of all cows at dry off
- ⊖ Follow a proper hygienic intramammary infusion technique
- ⊖ Once you start a selective dry cow therapy program, make sure you monitor if it is working by monitoring SCC and occurrence of clinical mastitis in the first month after calving

## Selective treatment of clinical mastitis

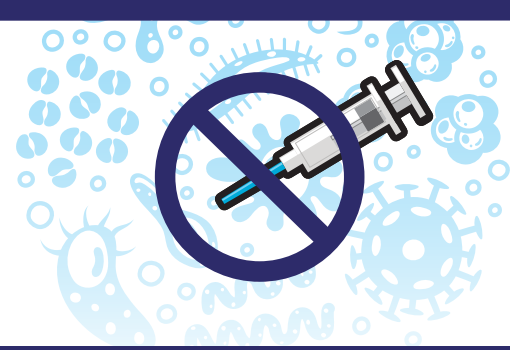
Selectively treating non-severe cases of clinical mastitis with antimicrobials is now a recommended practice for dairy farms.

Selective treatment protocols can be implemented without negatively affecting cure, somatic cell count (SCC), milk yield, recurrence, or culling.

Results from CaDNetASR showed that a large proportion of farms are already using selection criteria to treat clinical mastitis, with the severity of clinical signs and SCC being the most important decision factors for most farms.

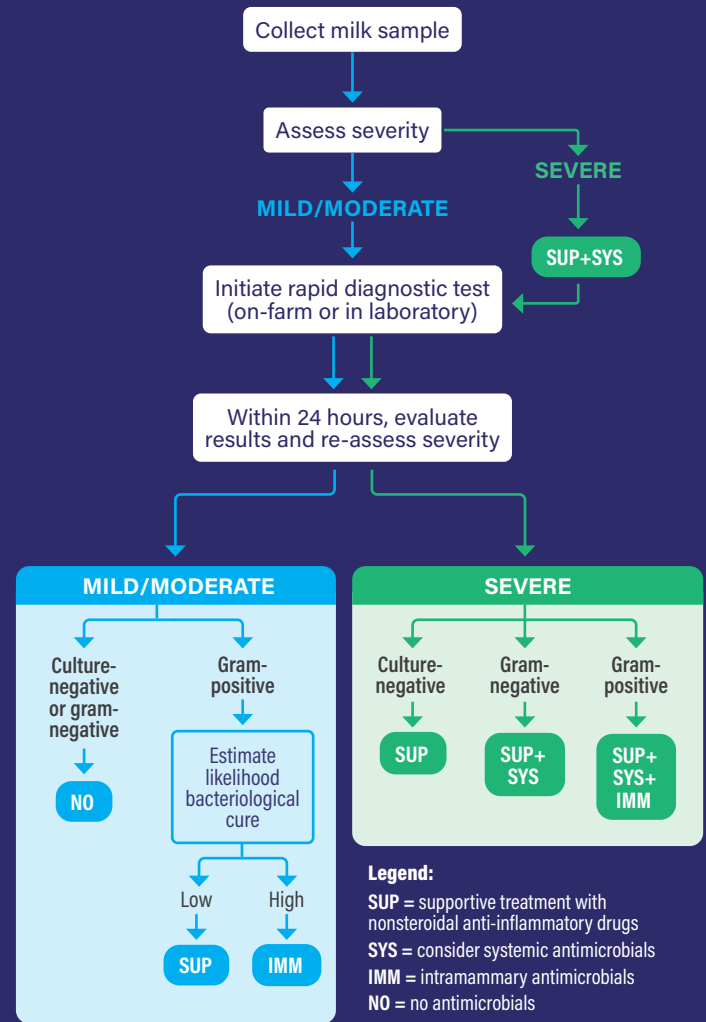
### When selectively treating cases of clinical mastitis, how do we choose which cows to treat with antimicrobials?

- ⊕ Not all cases of clinical mastitis will benefit from antimicrobial treatment
- ⊕ Exclude from treatment:
  - Non-severe clinical mastitis cases that have a high probability of cure without antimicrobials (Gram-negative, excluding *Klebsiella* spp.)
  - Clinical mastitis cases that no longer have bacteria present at time of diagnosis
  - Clinical mastitis cases with a low bacteriological cure rate (chronic cases)
- ⊕ Selective treatment of non-severe clinical mastitis can be adopted without negative udder health consequences
- ⊕ Quickly identifying if bacteria are present and if so, what bacteria are involved, is the most important factor in selective clinical mastitis treatment protocols
- ⊕ Use a rapid diagnostic test, either on-farm or via a laboratory, to determine the bacteria within 24 h after detecting the clinical mastitis case
- ⊕ When implementing a selective treatment protocol, it is important to reduce the infection pressure at the herd-level by following best management practices for udder health
- ⊕ On farms where most of the mastitis cases are caused by bacteria such as *E. coli*, a large proportion of cases can be excluded from treatment, thus reducing antibiotic use. Your veterinarian is in the best position to offer tailored recommendations on how to implement selective treatment in your herd



## Proposed protocol for selective treatment of clinical mastitis based on the latest scientific literature.

Reference de Jong et al.: Invited Review: Selective treatment of clinical mastitis.



To estimate the likelihood of bacteriological cure for gram-positive cases, it is recommended that farms review clinical mastitis history and recent SCC records

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