

# COAGULASE-NEGATIVE STAPHYLOCOCCI

## Overview

Coagulase-negative staphylococci (CNS), or environmental staph, refers to a group of over 50 bacteria of the genus *Staphylococci*. CNS is considered to be a minor mastitis pathogen because it accounts for only 5-10% of clinical cases.

## Prevalence

CNS are typically found on teat skin, nasal tissue, in the teat canal and on the hands of milk technicians. Thus it is not surprising that CNS are the most common bacteria recovered from milk samples from post-calving heifers (about 40-50%). CNS are more commonly associated with cows that have subclinical mastitis and somatic cell counts greater than 200,000 cells/ml.

## Diagnosis

Just like other mastitis pathogens, a CNS infection cannot be diagnosed just by looking at the symptoms of the cow. A milk sample from the suspected cow must be taken to a laboratory for diagnostic testing.

CNS are gram positive organisms and grow on typical media found in standard microbiological laboratories and on-farm culture labs. When reaching a diagnosis, it is important to note that CNS may be confused with some *Staphylococcus aureus* diagnoses. Typically, most CNS are coagulase-negative and most *Staph aureus* are coagulase-positive. However, there are some CNS that are coagulase-positive, such as *Staph hyicus* and *Staph intermedius*. Additional

microbiological tests may be needed to differentiate these species from *Staph aureus*.

## Symptoms

When CNS cause either subclinical or clinical mastitis infections, the presentation of symptoms will be relatively mild. Subclinical infections usually do not exceed somatic cell counts of 500,000 cells/ml, and eventually, many of these cases often self-cure. Additionally, of the small proportion of clinical cases due to CNS, almost all present mild symptoms with abnormal milk being the most severe symptom.

## Transmission

CNS are opportunistic pathogens that establish infections when teat disinfection is not used or is not used effectively. When thinking about the transmission of CNS, it is important to recognize that CNS are commensal organisms, meaning that they establish infections simply because they are present on the teat skin, teat canal and pre-calving udder secretion, but are not considered to be highly contagious.

## Treatment

Because CNS are minor mastitis pathogens, it is rarely advised to treat cows with subclinical infections during lactation.

Reasons for rare treatment of CNS:

1. High rate of spontaneous cure.
2. Little impact on milk yield.
3. Rarely cause clinical symptoms.
4. Cost of treatment and discarded milk will exceed benefits.

However, there are instances of clinical cases in need of treatment. In these cases there is no need for extended duration therapy, but rather a very short duration of one or two days. CNS pathogens do not evade deep into the secretory tissues of the mammary gland, so a short duration treatment can be very effective.

## Control

CNS are opportunistic pathogens whose primary reservoir is the teat skin. Therefore, their control is straightforward: teat dipping. Pre- and post-milking teat disinfection is the most effective strategy to reduce the exposure of these organisms.

Another important strategy to control CNS is the use of dry cow therapy of all quarters of all cows at the end of every lactation.

For more information  
[milkquality.wisc.edu](http://milkquality.wisc.edu)

