

# KLEBSIELLA – THE MAFIA MASTITIS

DEADLY AND DIFFICULT

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Mastitis remains one of the most challenging diseases facing the dairy industry, and when it comes to causes of mastitis, klebsiella is likely the worst! Out of all the causes of mastitis in dairy cows, klebsiella causes the most significant drop in milk *production* (Pinzon-Sanchez *et al.*, 2011) and these animals rarely return to normal productivity (Grohn *et al.*, 2004) That is if they even survive the disease. Most producers are familiar with the toxic effects of klebsiella mastitis and know these cows become very sick and go downhill very quickly! Treatment is usually intensive and expensive, and it is rare that cows with clinical klebsiella mastitis ever make a full recovery. In fact, klebsiella mastitis has been described as being worse than E. coli mastitis because it kills more cows, doesn't respond to treatment, lasts longer and is more persistent in the environment (Munoz & Zadoks, 2007). More than 50% of cows with clinical klebsiella mastitis often end up being removed from the herd (Gordon *et al.*, 2018).

Clinical klebsiella mastitis is fairly obvious, but **did you know that klebsiella could also be losing you significant production and money through sub-clinical infections?** Klebsiella does not actually like to grow in milk, therefore, they grow and reproduce rapidly, and then they die off very quickly. When fecal coliforms die off in large numbers, they release a powerful toxin which is what is responsible for the clinical signs of mastitis that a dairy producer may see, and since the bacteria are dead at this point, a milk sample culture often results in 'no growth'. It has been suggested that a large portion of “no growth” milk samples may have been coliform mastitis, with a large portion of these potentially being klebsiella. Obviously there were signs of mastitis present for the producer to have taken a milk sample, and since klebsiella is often already dead at this point, it makes sense that we would not find it with a milk culture. If you suspect that you are having klebsiella issues, you may require some more advanced testing like MALDI-TOF culture or PCR to look for bacterial DNA and not just live bacteria. These options should be discussed in detail with your herd veterinarian, however, producers should not assume that they have no issues with klebsiella mastitis based on milk culture results alone; klebsiella could still be there.

Klebsiella is most common in herds that use organic bedding like recycled manure solids or sawdust. As a fecal coliform, klebsiella favours growth in organic material and can be present anywhere that can become contaminated with manure; including bedding, milking equipment, water sources, other animals, *etc.* Although sand is a great bedding to use in preventing mastitis, klebsiella has also been implicated as a significant cause of mastitis in herds using sand. This is especially true in herds that wash and recycle their sand, with some reports suggesting that klebsiella can be more of a problem with this type of bedding than even sawdust (Godden *et al.*, 2008). The rise in popularity of recycled manure solids has also lead to an increase in klebsiella cases in Canada and any producer using recycled manure solids should discuss the potential impact and control of klebsiella mastitis with their herd veterinarian. Regardless of what bedding type you are using, it is likely that klebsiella is present as a cause of mastitis in your herd. In an assessment of 8 dairy farms in New York, it was found that klebsiella was present as a mastitis causing agent in all 8 farms (100%). (Alanis *et al.*, 2019)

In preventing klebsiella, it is important to go over normal mastitis management. This will always include overall animal health and cleanliness, bedding management, milking technique and machine functionality, post dipping and using dry cow therapy in your

herd following your veterinarians recommendations. Even with all of those management factors in place, klebsiella still causes issues on some of the best managed dairy herds in Canada. Vaccination for this disease has traditionally been very difficult as we have tried to rely on cross protection to provide some level of control against klebsiella. However, dairy managers finally have a klebsiella specific tool at their disposal with the first- and only- vaccine in Canada, ***Klebsiella Vetovax SRP®***. This new vaccine uses the SRP technology to vaccinate against a specific protein found in the cell wall of the klebsiella bacteria. This protein is very similar in other fecal coliforms as well. With this vaccine, Canadian dairy producers and veterinarians finally have a specific and proven tool to help control this devastating disease. This was the case when the SRP vaccine was used at the Iowa State dairy farm. This herd had been unsuccessfully using four doses of a J-5 vaccine to control klebsiella mastitis. After undergoing a protocol using the klebsiella SRP vaccine, the university found that they were able to reduce the incidence of klebsiella mastitis by 76%, the incidence of all coliform mastitis cases by 55%, and their somatic cell count by 42%. They also increased milk production by 2 pounds per cow per day. These findings were then published in the Journal of Dairy Science by Dr. Pat Gordon et al. in 2018.

Klebsiella mastitis is a killer, both silent and deadly. It could be significantly affecting your dairy herd whether you know it or not, and is often an issue even in the best managed herds in Canada. Controlling and treating this disease can be time consuming and expensive, often with less than favourable outcomes. Managing coliform and klebsiella mastitis is an important part of any herd's mastitis control program, and this may include use of the new SRP vaccine. All dairy producers should discuss coliform and klebsiella mastitis with their herd veterinarian and/or a local udder health specialist to determine if it is an issue in their herd. Any cow saved from a devastating case of klebsiella mastitis would be worth it!

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