

# THERE MAY BE MORE IN YOUR CATTLE'S WATER THAN MEETS THE EYE

Dr. Larry Smith, DVM, Dr. David Kolb, DVM, Michael Pawlak, Acepsis, LLC



Every spring **Rush Creek Ranch** transports approximately 10,000 head of feeder cattle from Texas, Mississippi and Alabama to their ranch location in Viroqua, Wisconsin. The cattle spend the late spring through early fall grazing on the lush Wisconsin pastures. In 2016, Rush Creek decided that they may be transporting diseases, such as cattle pinkeye, along with the animals through the transportation process.

In an effort to reduce the spread of the disease, Rush Creek made sure the transportation trailers were thoroughly cleaned and sanitized prior to the next shipment. While these cleaning protocols did provide favorable results, the disease still found its way back into the cattle in the early summer months.



Pinkeye, also known as infectious bovine keratoconjunctivitis (IBK), is one of the most common diseases of beef cattle. It is a highly contagious disease, causing inflammation of the cornea (the clear outer layer) and conjunctiva (the pink membrane lining the eyelids) of the eye.

Pinkeye is typically associated with shipping stress, increased sunlight, eye irritants such as tall, rough pasture grass, and other bacteria and viruses.

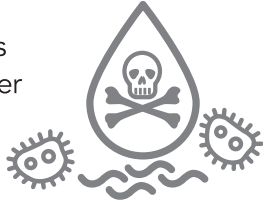
The eye and nose discharges of infected animals can carry the pathogens, so direct animal-to-animal contact, contaminated equipment, and animal handlers can transmit the disease. In addition to being very annoying to cattle, face flies have been thought to play the primary role in the transmission of *Moraxella bovis* (*M. bovis*), the principal causal agent of bovine pinkeye or infectious bovine keratoconjunctivitis. The question is, are the face flies the principal, or a supportive cause?

Both Dr. Smith and Dr. Kolb reasoned that the cattle waterers had a better opportunity to play the primary role in spreading the disease than a face fly. Dr. Larry Smith, DVM, had the Rush Creek Ranch cattle waterer's cultured and found a significant population of the *M. bovis* organism present. Since the *M. bovis* are shed in nasal secretions, the passing of the disease-causing organisms through the cattle waterers seemed logical. Upon inspection, the majority of cattle waterers were also coated with slimy surface biofilms substances.

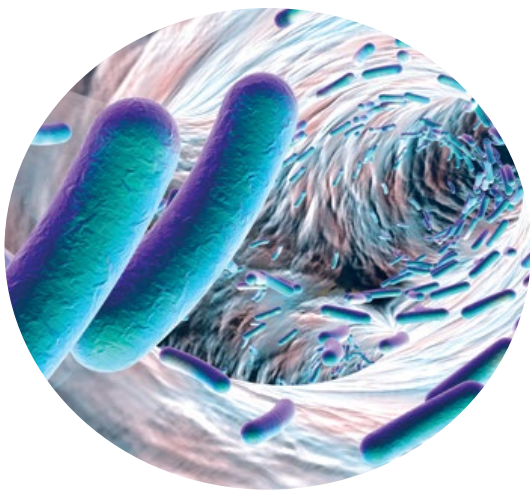


### What is biofilm?

Biofilm is defined as a self-sustaining layer of microorganisms congregated in an extracellular matrix



on surfaces exposed to moisture. The bacterial organisms within the matrix are protected from most types of antimicrobial agents. In other words, the slimy film growing in pipes, water tanks and every other surface that cattle come in contact with. Organisms use biofilm to build their own protection system against common antimicrobial agents. The majority of disinfectant solutions, which are effective against individual organisms, can't cut through the protective layers of biofilm.



There are two primary components of every biofilm: 1) the "matrix" that adheres to the walls of any wet surface and forms a micro-colony of support; and 2) the planktonic/free floating cells that attach to, feed from and develop on this matrix and then break off to form new biofilm colonies and are also dispensed through the watering system.

There are three critical things to know about biofilms:

1. Biofilms exist in every water system. No exceptions.
2. Mature biofilms form in minutes and hours, not days and years.
3. Biofilms are likely the largest source of water-borne pathogens.

Unfortunately, it's not as easy as we used to think to eliminate, or even substantially reduce water-borne pathogens. It's been commonly thought of as a one-step process: disinfection of the source water. But it turns out that **removing biofilm is the most important factor**. Several research results suggest that two thirds or more of the water-borne pathogen threat to your animals is coming from the biofilm in the water systems, even with a clean water source. If you take a purified water system and expose it to a new bacterial growth source, such as contaminated nasal secretions, you will again grow contaminated biofilm.

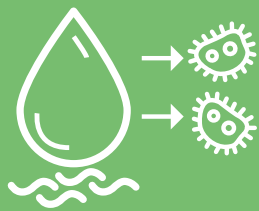
Dr. Donald Sockett, DVM, MS, PhD, ACVIM at the Wisconsin Veterinary Diagnostic Lab has written a number of articles on proper animal hygiene protocols for animal health. In a BOVINE VETERINARIAN article, titled: *Sanitation For Calf Scour Prevention* (January/20015), Sockett identifies chlorine dioxide (ClO<sub>2</sub>) as the most effective disinfectant and quick kill at the lowest concentration across the spectrum of disease causing organisms, and extremely effective at destroying biofilms and the bacteria that form the biofilm.

### A 90% PINKEYE REDUCTION!

In 2017 / 2018, Rush Creek began treating their cattle waterers with low concentrations of chlorine dioxide (less than 5 PPM) daily. Matt Ludlow, a principal of Rush Creek Ranch, reported that their incidence of new infections was immediately reduced, and found that their treating the water from the beginning of 2018 reduced their new cases of pinkeye by 90% on a year vs. year average. Ludlow stated that the treating of the waterers also kept the biofilm within the waterers to a minimum. Dr. Kolb points out that it is virtually impossible to isolate *M. bovis* carrier animals from non-infected animals, when both animals are drinking from the same water source.

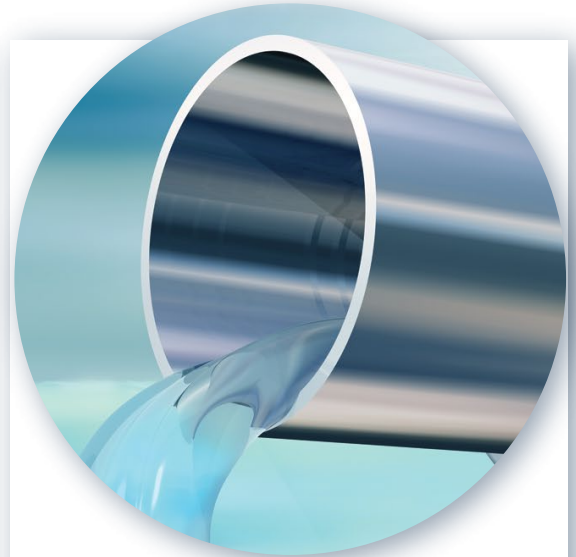


The Rush Creek Ranch results were achieved by using Acepsis<sup>™</sup> AquaSoar<sup>™</sup>. AquaSoar<sup>™</sup> is a concentrated, two component, activator / base technology that produces chlorine dioxide on site, using the farm water source for dilution. The specially formulated AquaSoar<sup>™</sup> Activator / Base precursors produce chlorine dioxide at the highest yield, in the shortest amount of time.



**BIOFILM REMOVAL**  
AquaSoar<sup>™</sup> enhances primary water hygiene effectiveness by penetrating and breaking down the structural components of biofilm, removing deposits that facilitate the growth and protection of dangerous pathogens.

In other words, AquaSoar<sup>™</sup> breaks up the "organic glue" that holds biofilm together, binding them to the surfaces within water systems. Adding AquaSoar<sup>™</sup> to the water system provides the ultimate "one-two punch": AquaSoar<sup>™</sup> destroys the biofilm structure and eliminates the bacterial presence within the water system.



### STEPS TO TAKE

1. COLLECT WATER SAMPLES at the water source and throughout the livestock housing facilities, identifying a full water analysis of the operation
2. OUTLINE A WATER HYGIENE program specific to the facility
3. INSTALLATION of the hygiene system

## Measurement of Oxidizing Agent ORP Values In Pathogen Disinfection\*

OXIDIZING AGENT | OXIDIZING AGENT ORP VALUE RANGE (mV)

**CHLORINE DIOXIDE (ClO<sub>2</sub>)** | **600 → 1000 MV**

**OZONE\* (O<sub>2</sub>)** | **700 → 1000 MV**

**IODOPHORS (I<sub>2</sub>)** | **400 → 600 MV**

**HYDROGEN PEROXIDE** | **300 → 500 MV**

**SODIUM HYPOCHLORITE** | **250 → 500 MV**



\*Ozone is greatly influenced by the water quality and ozonation system.



## MORE IN YOUR CATTLE'S WATER THAN MEETS THE EYE!

While Rush Creek Ranch's results aren't a peer reviewed study, it has made Matt Ludlow a believer. "At first, I looked at treating the waterers as a stop-gap measure. Now I look at it as a necessary component in keeping my animals healthy. The money that we save by just treating the water vs. treating sick animals is amazing! It has to be a 100 to 1 return!"

"Ask yourself the question," states Dr. Kolb, "Would you drink from the same glass of water if you knew that someone with a case of the flu just drank from that glass? Animals don't get that option. Treating the waterers with low levels of chlorine dioxide makes sense. Bleaches and peroxides can't touch the biofilm, so if you can't get rid of the source of a problem, you aren't solving it! In this case, an ounce of prevention is definitely worth a pound of cure!"



Matt and Reid Ludlow, Rush Creek Cattle Ranch, Viroqua, Wisconsin

**For more information, call [Acepsis™](#) or your local representative.** [f](#) [in](#) [t](#) [v](#)

ACEPSIS™, LLC is an animal health based company that is focused on the development of state-of-the-art animal hygiene technologies. Our Company's mission is to apply innovative animal hygiene technologies into the agricultural and veterinary market sectors.



ACEPSIS™, LLC | 713 North Main Street | Lodi, WI 53555  
(608) 203-5535 | [info@acepsis.com](mailto:info@acepsis.com) | [www.acepsis.com](http://www.acepsis.com)  
© 2023 Acepsis™, LLC. All rights reserved.