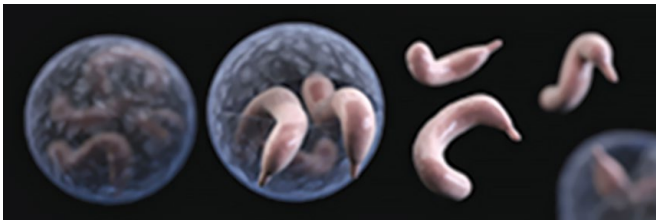


"ONE OF OUR CALVES DIED"

Rob Krijnen, Dr. David Kolb, DVM, Michael Pawlak, Acepsis™, LLC

"One of our calves died on Tuesday, November 12th, 2019. Two years ago, we wouldn't have thought twice about it. We were losing more than 20% of our calves back then and had no idea why. Then we found out it was Crypto!" commented Rob Krijnen, an owner of **Krynenhill Holsteins**, Thorndale, Ontario Canada.

Krynenhill milks 400 cows and handles approximately 450 calves a year. "What was important about this calf dying is that it was the first calf that we've lost since June of this year! Our YTD pre-weaned calf mortality rate is now below 1%! We are extremely proud of the job we are doing in this area!"



FIRST STEPS:

"First, it was important to find out the primary cause of our problem. Our calves had diarrhea and we needed to find out what was causing it. Working with our veterinarian, we identified that we had Crypto in our calf barn and maternity area. Once we knew what we were up against we created a strategy to get control of the problem," commented, Krijnen.

"We found out that Crypto was not only a risk to the calves, but also to everybody who worked in our barns, or handled our calves. That made it an even more serious problem!"



CRYPTO

Cryptosporidium parvum, commonly referred to as **Crypto**, is a group of single-celled intestinal parasites in animals and humans that causes the disease **Cryptosporidiosis**. Reported cases of the disease originate from two primary areas within calf facilities:

- Fecal contamination within the calf housing areas (Maternity and pens)
- Fecal contaminated drinking water or food

Crypto is a disease contracted from ingesting infectious *Cryptosporidium parva* oocytes, or immature eggs (A), from direct contact with fecal material from animals actively shedding these eggs. The incidence of bovine *Crypto* diarrhea is higher on dairy farms where confinement and the moist environment is conducive to the spread of these protozoa.



TREATED DRINKING WATER

"We knew that we had to limit the number of new calves getting sick. We did research on *Crypto* and determined that it doesn't pass from the dam to the calf through the blood system. It resides in a cow's digestive system and a dam sheds eggs in her manure. *Crypto* is also passed through the drinking water. We immediately started treating the water. We made the decision that it would be useless just to treat the calves' drinking water, because they weren't the carriers (yet)!

It's like if you have the flu and drink some water out of a cup. You aren't going to pass that cup to your kids to drink! It just made sense for us to treat *all* of the drinking water that we were providing to our animals."



"We started treating all of our cattle's drinking water with chlorine dioxide (**AquaSoar**[®]). We chose **AquaSoar**[®] because we can monitor our water with a meter to determine if the chlorine dioxide is doing its job. It literally only cost pennies per cow per month! We figured that that was money well spent."

Chlorine dioxide has been proven to be extremely effective when used as a premise sanitizer on walls, floors and feeding equipment.*

*Original article: "Sanitation for calf scours prevention," John Maday, Editor, *Bovine Veterinarian*, January 14, 2015. Reprinted courtesy of Acepsis[™], LLC



FACILITY HYGIENE

"A calf can't be born with *Crypto*; it picks it up after it is born, usually within a couple of hours of birth. That means we had to start in the maternity pens. We initiated a "total pen and maternity equipment hygiene program." This was just getting down to basics: Create a starting point and make sure that this area is covered. Our veterinarian provided us an article by Dr. Donald Sockett, DVM from the University of Wisconsin Veterinarian Diagnostic Laboratory that was in a *Bovine Veterinarian* publication*. The article outlined how to clean our housing areas and feeding equipment. We followed it to a "T"! In the past we figured a high-pressure washer was the best cleaning tool that we had. We found out that it was more the problem than a solution!"

"Once we had an understanding of what the problem was, it made it easier to create a cleaning protocol. We had not done that before. We also started using products that were more effective in doing the job that we needed to do. We replaced the Dawn dish detergent with hot water, a chlorinated alkaline foaming detergent (**Habistat**[®], a chlorine dioxide based product designed for this application) and some heavy-duty elbow grease. We adopted this same cleaning process in our pens and with our feeding equipment. Now, our cleaning protocol is a key element in our total calf management program."

Measurement of Oxidizing Agent ORP Values In Pathogen Disinfection**

OXIDIZING AGENT | OXIDIZING AGENT ORP VALUE RANGE (mV)

CHLORINE DIOXIDE (ClO ₂)		600 → 1000 MV
OZONE* (O ₂)		700 → 1000 MV
IODOPHORS (I ₂)		400 → 600 MV
HYDROGEN PEROXIDE		300 → 500 MV
SODIUM HYPOCHLORITE		250 → 500 MV



ORP Values In Pathogen Disinfection***

PATHOGEN SURVIVAL IN SECONDS (S) OR HOURS (H) AT ORP LEVELS (MV)

Pathogens	<500 ORP (mV)	500 - 600	600 - 700	700+
E. COLI (0157:H7)	> 300 S	< 60 S	< 10 S	< 1 S
SALMONELLA SPP.	> 300 S	> 300 S	< 20 S	< 1 S
LISTERIA MONOCYTOGENES	> 300 S	> 300 S	< 30 S	< 1 S
THERMO-TOLERANT COLIFORM	> 48 H	> 48 H	< 30 S	< 1 S

ABOUT BIOFILMS

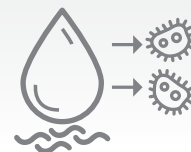
There are three critical things to know about slimy biofilms:

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.

It's not as easy as we used to think to eliminate, or even substantially reduce water-borne pathogens. 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.

BIOFILM REMOVAL

AquaSoar™ 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.



A NEW CALF HOUSING PLAN

“We house all of our pre-weaned calves in a housing barn. We had been bringing our pre-weaned calves into group pens, 8 calves to a pen, even the newbies. We stopped that and created individual pen areas for our newborn calves, and at about 2 – 3 weeks of age we move them from the individual pens to group pens. This allowed us to identify and segregate any sick calves, keeping them away from the healthy calves. To do this we created 4 – 8 single-pen areas. We fully populate the 8 single pens, and then eventually move these calves after 2 – 3 weeks into our group pens. This gives us an 8-pen area that has no calves and that we can fully clean before the next group of calves moves in. We do this even through the wintertime. That takes dedication, but it is worth doing. We set up a new cleaning room that we move the pen equipment into to fully clean the pen walls and equipment.”



CONCLUSIONS

“We’re not happy that a calf died this week, but we sure are proud of the work we have done to make sure that this calf was the exception, not the rule!”



Kryneshill Holsteins, Thorndale, Ontario Canada

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

***Oxidation Reduction Potential (ORP) for Disinfection Monitoring, Control and Documentation; University of California, Trevor Suslow, Department of Vegetable Crops, University of California - Davis

For more information, call Acepsis™ or your local representative.



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 | www.acepsis.com
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