

CALVING EASE

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Superman Comics Revisited

Can you remember the Superman comics? Clark Kent and Lois Lane? Faster than a speeding bullet? His only weakness was "krypton" -- an element from his native planet.

What's this got to do with raising calves? Well, now that warm weather is here again, one of our weaknesses is "krypto." Forgive the editorial spelling of *cryptosporidium*. In a recent article discussing the frequency of "krypto," Garber and others noted:

Almost half of the calves between 7 and 21 days of age had *cryptosporidia* in their fecal samples. Prevalence was highest during the summer. Farms with multiple-cow maternity facilities [read: cows calving in a springer barn] and farms with more than 100 milking cows were the most likely to have calves with *cryptosporidia*. (p. 86)

They also reported on the percentage of infected calves [this means the calves had *cryptosporidia* oocysts in their feces] by age:

AGE	Percent infected
Less than 4 days	2.5%
1-3 weeks	48.1%
3-5 weeks	21.9%
More than 5 weeks	less than 15%

They explain this variation in infection rates. "This finding was consistent with the life cycle of the organism, because 2 to 4 days are typically required from infection until oocysts are first shed in the feces. **Oocysts were most frequently found at 12 days of age.** [emphasis added] Garber and others discussed why this tiny one-cell parasite is so likely to be a threat in a calf's environment. Their main point was that the oocysts are able to infect the calf immediately at the time they are shed.

["Shed" means the oocysts are released from the calf's host intestinal cell. That means the oocysts can further infect the calf without even leaving the body!] This is in contrast to coccidial oocysts that require 4 to 5 days after being shed before they become infective.

Implication: While cleaning the calf's environment will reduce the number of "krypto," this does not eliminate the oocysts inside the calf. Cleaning the environment will, however, reduce the number of other parasites and bacteria. That means the total number of "pathogenic agents" will go down. And, overall stress on the calf should go down, too.

Susan Carbone, a research scientist at Immucell Corp. [Immucell produces *cryptosporidia* oocysts for research use], shared with us two methods that do not kill "krypto" and two that do. First, "warm" water is useless -- you simply spread the oocysts around. Second, chlorine bleach is useless -- Susan washes her research oocysts in chlorine bleach to clean them without harming them. Third, "hot" water [over 160 F] will open the oocysts and kill the cells inside -- but that means the water must stay at at least 160 F until the last bottle or bucket is washed. Fourth, freezing and thawing opens the oocysts, exposing the cells inside to sun and air, which kills them.

It's our good fortune that our 10 to 20 day-old calves rapidly develop immune defenses against this parasite. The most vulnerable group of calves seems to be those between 10 to 14 days when (a) the internal "krypton" population seems to peak, (b) their fluid losses are the greatest and (c) the pneumonia bacteria, *Pasturella hemolytica* and *Pasturella multocida*, are poised ready to swarm over the lower respiratory system in case the calf's immune resistance is reduced due to scours-stress.

Our challenges seem to be: (1) observe good sanitation procedures to reduce our calves' environmental exposure as much as practical, (2) using antibody-rich milk, feed *cryptosporidia*-specific antibodies to young calves to reduce their internal exposure and (3) feed lots of fluids to treat the "transient secretory diarrhea" [the authors' term for scours].

Reference Cited: L.P. Garber, M.D. Salman, H.S. Hurd, T. Keefe and J.L. Schlater, "Potential Risk Factors for *Cryptosporidium* infection in dairy calves." *Journal of the American Veterinary Medical Association* (205:86-91) July 1, 1994.

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