DAIRY VETERINARY NEWSLETTER

March 2015

Meloxicam - Pain Relief in Cows and Calves

Analgesia for dehorning calves has been a somewhat controversial subject since I can remember. We learned in vet school about lidocaine infiltration with needles including nerve blocks and/or whether initially intended or not (in the case of a nerve block that did not really find the nerve) subcutaneous administration around the base of the horns. This took time, expense, and many owners said it seemed like it bothered the calf as much as the dehorning itself. When I dehorned dairy animals in practice, including as an Ambulatory Resident at Michigan State, we rarely used any analgesia. Many surveys and discussions at veterinary conferences confirm that this was the common way to do it, and seems to still be the case now according to recent data. I remember a colleague telling me that he liked the cold spray-on fast acting local anesthetics like Pontocaine, so he decided to try it for electrical hot dehorning. He sprayed it around the horns of the first calf, started dehorning and flames lit up. They were quickly blown out without apparent major damage but this spectacular display led to no more using the spray after a sample of one calf.

It was also true that the vast majority of bovine dehorning I did in practice was not on calves with small horn buds. Most owners used caustic paste, an electric ("hot iron") dehorner, a tube dehorner, or a small Barnes dehorner to do their own dehorning if the animals to be dehorned were young calves. I always liked it if as part of calfhood vaccination and extra teat removal, I was doing that kind of dehorning. However, much of the dehorning I did was when for whatever reason, whether it was purchased animals that were not dehorned, or that the farm labor force did not get to it on young calves, we had to remove moderately large to huge horns. The large Barnes, electrical saw, or most commonly, Keystone (the large ones with two handles similar to wooden baseball bats) dehorners were the tools of the day. Pulling arteries with a needle nose pliers (I found that they worked better than box-lock hemostats that would get sprung) and spraying and packing or using Pine Tar (that really helped keep flies and maggots out) on the open cornual sinus was what came next.

I often wonder what the solution is today when for whatever reason, a dairy has a large number of animals with large horns to dehorn. Practicing vets don't seem to be as involved, or if they are they are not saying much about it at conferences because today we are all supposed to be herd health consultants and not do so

much "fire engine" work. Veterinarians are still involved in either dehorning or teaching farm employees to dehorn at least the young calves, though. It seems that we may have a relatively new practical way to produce fairly long-acting analgesia for calves after dehorning and castration, and also for cows following surgery, dystocia, or sometimes to help with lameness or injuries. This is in the form of meloxicam, an NSAID that is available in 15 mg tablets. The tablets cost approximately 3 cents apiece. The dose is 1 mg/kg (0.45 mg/lb).

Meloxicam tablets inside gel capsules

A colleague told me that they use 4 tablets (60 mg, enough for up to 60 kg, 132 lb of body wt) inside a small gel capsule P.O. per calf. Some veterinarians administer local anesthesia as well at the time of dehorning, and as it wears off, the meloxicam takes effect. Sometimes the farm personnel give the calf another dose of 4 tablets either the next day or after two days. The same colleague also administers 40 tablets (600 mg, enough for up to 600 kg, 1320 lb of body wt) inside a large gel capsule P.O. per cow for pain relief following surgery, dystocia, etc. Again, sometimes this is repeated every one or two days by the farm personnel.

Meloxicam meat and milk withdrawal

Dr. Hans Coetzee, formerly of Kansas State University and now at Iowa State University, has conducted much of the research on meloxicam in cattle. He recommends a meat withdrawal of 21 days and a milk withdrawal of 96 hours following meloxicam administration. Interestingly, the meat withdrawal research was based on a dose of 0.5 mg/kg instead of the dose of 1 mg/kg. As with any medication, including just about any drug administered to dairy cattle, there is not much information regarding how many subsequent doses at what time intervals, or what the impact of low body weight cows who might be administered the standard dose of 40 tablets would be regarding the withdrawal time after the final dose. FARAD could probably help with this question if they were provided specific information. Meloxicam seems to be an affordable and practical way that we can provide analgesia to dairy animals; maybe it will become widely adopted.

Sanitation on Farms - Is Bioluminescence Useful for More Than Testing Milking System Wash?

The first time I ever heard of ATP (adenosine triphosphate, that substance we learned about in energy metabolism and biochemistry classes) bioluminescence testing for detection of bacterial loads on dairy equipment was about 15 years ago. It was at a Certified Milk Inspector School that we used to attend each year in New York State. I remember how impressive it was that a stainless steel pan could look very clean, but the food scientist and sanitarian who was demonstrating it told us that he had put milk film on it about an hour earlier. You could hold it in the light, turn it this way and that and you just could not really see the milk film. Then he used a hand-held luminometer to measure the bacteria count on a swab he made of the surface. When he swabbed where the milk film was, and put that swab into the luminometer, the meter lit up quite impressively. A swab from the clean part of the steel did not light up much at all.

ATP luminescence is now widely used by milking equipment and milk buyer field personnel to investigate bacteria count problems related to milking equipment sanitation. Refereed journal publications regarding the hand-held luminometers are hard to find. However, refereed publications regarding the technology itself include Hunter et al., Apr 2010 J Food Prot. A good summary of the use of the hand-held meters including by veterinarians investigating sanitation on farms is in the March 2015 issue of Dairy Herd Management by M. Hanson. It includes information on ATP luminometer usage by Dr. Rob Farrugio in Wisconsin.

The article states, "The [ATP luminescence] technology is affordable and provides quick results. Best of all, the information can be used over time to track progress in on-farm cleaning methods. Farruggio does a baseline sample set when he starts the equipment-cleaning education process with a client, helping identify areas needing attention."

Dr. Farruggio is quoted, " 'Once a new set of cleaning protocols is in place, I use the swabbing tool as a friendly reminder, making random checks from time to time when I'm visiting a farm,' he said. 'Most of my clients actually think it's pretty fun to have these surprise checks. They want to see how they're doing, and have witnessed the impressive results that improved equipment cleaning methods can have on calf health and performance. Having the ability to not only more effectively clean equipment, but nearly instantaneously measure the results of those practices, has helped many herds make great strides in calf health,' said Farruggio. 'It has become a very gratifying way to assist my clients.' "

I found luminometers and test kits starting at $1300.00 when I did an internet search.

This table about dairy cleaning chemicals comes from that Hanson article:

TABLE 1. COMMON DAIRY CLEANING CHEMICAL CHARACTERISTICS

Comparison Component	Ozone (O^3)	Hydrogen Peroxide (H_2O_2)	Peroxyacetic Acid (POA)	Hypochlorus Acid (HOCl)	Chlorine (CL_2)	Chlorine Dioxide (CLO_2)	Quaternary Ammonium Compounds	Phenols (C_6H_6O)	Iodoph or (I_2)
Giardia	YES	NO	NO	NO	NO	YES	NO	NO	NO
Cryptosporidium spp.	YES	NO	NO	NO	NO	YES	NO	NO	NO
Rotavirus	YES	YES	YES	YES	YES	YES	YES	YES	YES
Coronavirus	YES	YES	YES	YES	YES	YES	NO	NO	NO
Affected by pH	NO	YES	YES	YES	YES	NO	YES	YES	YES
Corrosive	YES	YES	YES	YES	YES	NO	VARIES	YES	YES
Effect on Biofilms	YES	VARIES	VARIES	NO	NO	YES	NO	VARIES	NO
EPA Approved - Water	NO	NO	NO	NO	YES	YES	NO	NO	NO
Carcinogenic	NO	NO	NO	YES	YES	NO	YES	YES	YES
Inactivated by Organic Material	NO	YES	YES	YES	YES	NO	NO	NO	YES
Use as water, sanitizer and disinfectant	NO	NO	NO	NO	YES	YES	NO	NO	NO
Commercial Brand Name	Generated by Equipment	Various	Virkon S®, Oxysept 333®, Vortexx®	Chlorine and acid at a pH of 5-7 (generated)	Various (Chlorox Bleach®)	OxyMer®, Oxine®	Roccal®, Zephrin®, DiQuat®	One Stroke, Environ®, TekTrol®, Phenu-Tek III®	Various

SOURCE: OXXION CONSULTING

Long hoses on farms are often bacterial paradise inside

Many dairy veterinarians have probably had the experience that overused inflations and milking system hoses on dairy farms can become contaminated with bacteria, especially *Pseudomonas* spp. or *Serratia*

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marcescens. In addition to this, Farrugio talks about long hoses such as garden or milk house hoses on farms in the same article. Bacteria counts inside them are often "off the charts", he said.

" 'We think of a hose as a closed system, and we're only running water through it, so it's hard to believe it can be so easily contaminated,' he said. But any small crack or micro fissure can allow bacteria to enter, and simply allowing the end of a hose to touch the ground also invites bacteria in. Once inside, it sets up camp encased in biofilm - - . If a bacteria-laden hose is used to transport water for delivering calves' drinking water; mixing milk replacer; or cleaning housing areas, it's easy to see how it becomes a disease transport vehicle. Farruggio said cleaning and disinfecting garden hoses probably is not as practical as simply replacing them every 3 to 6 months."

Please let us know your comments and also suggestions for future topics. I can be reached at (435) 760-3731 (Cell), (435) 797-1899 M-Tues, (435) 797-7120 W-F or **David.Wilson@usu.edu**.

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