

DAIRY VETERINARY NEWSLETTER

November 2012

Navel Dipping – An Important Factor in Reducing Calf Death Loss

Navel dipping – even more important than we might think?

I have noticed that the longer I have been out of veterinary school, many dairy and veterinary subjects, treatments or products go out of style and then come back in repeatedly. Some should stay out of fashion, and some should always be “in”. During the 1980’s there was a suggestion for a time that navel dipping of newborns inflamed the calf’s (or foal’s) umbilicus and was a band-aid so it was not important.

“Environmental sanitation” was the key. I never figured out how to keep calving areas clean and dry at all times, or always get fresh cows (or foaled mares) moved to a clean pen such that neonatal animals were in pens with clean bright straw, or clean sawdust, etc. all of the time, including 3 a.m. As farms get larger, this task seems to be exponentially harder. Farms that ceased dipping navels at that time often indeed had more omphalophlebitis, navel ill, polyarthritis and death loss of calves that improved when they went back to dipping navels.

A new article re-emphasizing the importance of dipping navels was posted in the Dairy Herd Network electronic newsletter. It can be seen at: <http://www.dairyherd.com/e-newsletters/dairy-daily/Navel-dipping-Are-you-putting-calves-at-risk-167077695.html>

Bethany Fisher with Purina Animal Nutrition LLC apparently wrote the article, and says, “A common area - - overlooked on many operations is a calf’s navel or umbilicus - -This simple thing that triggered the first breath could easily be the source of the last.” A reference is quoted stating that “ - -calves with non-dipped navels had an 18% death rate, compared to 7% for calves with dipped navels.” Statistics in the U.S. continue to show that dairy calf mortality averages 11% per year, but many farms are in one of two groups – approximately 3 – 7% mortality of dairy calves living to be at least 24 hours old, or 15 – 20% mortality. It seems that one practice associated with dairy farms more likely being in the first group may be dipping navels of newborn calves.

The earliest electronically saved publication I could find on navel ill was from Feb. 15, 1978, R.H. Bennett et al., JAVMA. In a Holstein herd, they found 30/215 (14%) prevalence of polyarthritis in calves; 6 of 7 tested had *Mycoplasma alkalescens* isolated. However many cases were not cultured for a specific agent. Based on necropsies and some other diagnostics, they considered the disease likely a “ - - complication of umbilical exposure to *M. alkalescens*, causing omphaloarteritis and subsequent arthritis. Before and during the arthritis problem, the umbilicus of newborn calves was dipped in an organic iodine product with 10% glycerin, - - a postmilking teat dip. After the cause of the arthritis was determined, the umbilicus of each newborn calf was

treated with 7% tincture of iodine and no new cases of arthritis occurred.” How long the cases were monitored after the change in navel dip was not stated. More information regarding teat dip vs. 7% iodine for dipping navels follows later.

In the Oct. 15, 1992 JAVMA, S.E. Lance et al. reported on 48 dairy herds studied for 1 year by monthly veterinary visits to monitor environment, housing and management practices and preweaned calf mortality. Mortality calculations were from written records of calf births and deaths. Analysis of covariance explained 39% of the variation in mortality among herds. Factors significant included herd size, days on nipple feeder, navel disinfection, and type of housing. Unfortunately the electronic summary does not expound. Navel disinfection presumably was associated with decreased rather than increased death loss. It is noteworthy that this study shows that even adjusting for the other factors above, navel dipping is an important practice.

In Vet Clin N Am Food Anim Pract Mar. 2008, it is referenced that neonatal calf mortality seems to be actually increasing, and that, “Omphalitis, or navel ill, occurs in 5% to 15% of newborn calves”, and publications cited show, “- - benefits [of] navel antisepsis include reduced calf morbidity and mortality, specifically, prevention of mycoplasma arthritis and reduction in respiratory disease.”

Do different disinfectants matter in terms of effectiveness in dipping navels?

The book cited above contains the most complete discussion I have seen regarding choice of navel disinfectants. It also acknowledges, as alluded to earlier, that some studies have suggested that, “navel antisepsis failed to prevent omphalitis or was no more efficacious than no treatment.” Chlorhexidine has recently been studied as possible preferred alternative to iodine as a navel dip. A study in foals compared 1%, 2% and 7% iodine dips with 0.5% chlorhexidine dip for navels. It “- - concluded that chlorhexidine and 7% iodine are the most effective in reducing cord bacterial growth but 7% iodine occasionally sloughed the adjacent skin and may contribute to aseptic omphalitis.” (Note that since 2007, the DEA has restricted the sale of 7% iodine in the U.S. because it was being used in methamphetamine manufacture.)

Summary of the latest information on neonatal calf navel dipping

In the March 2010 J Dairy Sci, E. Vasseur et al. reported on calf management practices on 115 Canadian dairy farms. Farms were selected as representative of Quebec dairies, all milking Holsteins. Producers were interviewed on farms using a questionnaire. Findings included, “In 36.8% of herds surveyed, the disinfection of the newborn’s navel was not done despite recommendations (National Farm Animal Care Council, 2009). Although it has not been proven in controlled experiments, it is generally recognized that early [umbilical] disinfection [reduces] infections so that calf morbidity (respiratory and enteric diseases) and mortality are decreased.” A reference for navel disinfection effectiveness was provided.

Back to the Dairy Herd Network article mentioned above, Fisher suggests: “Make sure to achieve full coverage from tip to abdomen. A navel dip cup is good to use to ensure full coverage of the navel, but be sure dip cups are also cleaned and refilled with new iodine regularly. Spraying the navel is also acceptable, if full coverage is achieved.

Another key part of monitoring your navel dipping protocols is detecting navel infections and illness. Fisher explains the most common signs include [swelling, hardness, wetness,] or pain in the navel region.”

It was surprising to me, but also true from what I could find, that there are no published controlled studies following groups of calves from birth to weaning comparing navel dipped calves to a control group without dipped navels. Studies have been between farms or groups of farms, or during different time periods when

the same farm dipped or did not dip navels, and dipped calves have usually fared better than non-dipped calves, but studies have not used direct comparison of 2 groups in the same conditions at the same time. If our readers know of any controlled studies, please let me know. Based on experience, as well as most of the comparative statistics, I still recommend dipping navels of newborn calves. 0.5% chlorhexidine appears to be the preferred navel dipping compound to use in light of the regulation of tincture of iodine sales.

Treatment of Mastitis with Vitamin D

Vitamin D and bovine mastitis

In many years of working in mastitis and udder health and attending conferences, reading publications, etc. I had never heard much about bovine mastitis and vitamin D levels in cows. In the Aug. 2005 Polish J Vet Sci, V. Bandzaite et al. reported that *serum* vitamin D levels were lower in mastitic cows compared with other cows. Cause and effect - which came first - was not clear. However, another study in sows suggested that induced mastitis did not affect serum vitamin D; vitamin D levels beforehand might affect mastitis.

The Iowa State University Animal Industry Report 2009, which can be seen at:

<http://www.ans.iastate.edu/report/air/2009pdf/R2432.pdf>

reported that infusion of *Streptococcus uberis* into one quarter of 3 Holstein cows resulted in higher levels of vitamin D in inflamed mammary tissue in comparison with control quarters of the same cows.

The same Iowa team led by John Lippolis at the National Animal Disease Center (NADC) in Ames, Iowa, report that supplemental vitamin D may delay and reduce the severity of intramammary infections (IMI) in dairy cows. "A higher level [of vitamin D] needs to be in the blood for proper immune function. But generally, milk has very little vitamin D," said Lippolis. They used the prehormone 25-hydroxyvitamin D, present in blood, but not in milk, in an intramammary challenge study reported in PLoS ONE, October 2011, found at:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3184989/pdf/pone.0025479.pdf>

In the above study, 10 first lactation Holstein cows with no IMI were all infused in one quarter with *S. uberis*. 5 cows were also infused with 100 µg of vitamin D₃ in 10 ml solution at each 2X milking for the next 5 days, beginning at the same time as the challenge infusion. The other 5 cows were infused over the same 10 milkings with 10 ml solution only as a control. No antibiotics were administered to any cows.

All 10 cows became milk culture-positive for *S. uberis*. Beginning at the 4th milking after induction of IMI (and the beginning of treatment or control at the same time), bacteria counts (P < 0.05) and SCC (P value not stated) were reduced in vitamin D treated cows, while their feed intake and milk production trended toward being higher than that of control cows. Clinical mastitis signs were not discussed, but presumably were not severe. Serum vitamin D levels were never different between the cows infused with vitamin D and the control cows; I would not have expected an intramammary infusion to affect blood/serum levels. The authors provide a discussion and conclude that further study of vitamin D IMM infusion as a treatment for mastitis is needed.

One thing I find interesting about the possibility of vitamin D infusion vs. mastitis is the question of whether this might actually be a Generally Recognized as Safe (GRAS) treatment such that milk or meat from treated cows, if no other treatment were used, would have no withdrawal times required. Many non-antibiotic treatments over the years have been touted as GRAS, but FDA has almost never regarded mastitis treatments as such if and when they become approved. Vitamin D is routinely added to milk, so the carrier would

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probably be the key factor in whether such a treatment might be considered as no adulteration or human health threat to meat or milk. (The FDA list of GRAS substances is interesting. Many of them are listed as Pending, including milk protein concentrate, red grape pomace extract, and sugar beet fiber. However, those that FDA has fully approved as GRAS include sulfuric acid and *Bacillus coagulans* spores.) We may hear more in the future regarding vitamin D as a bovine mastitis IMM treatment.

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-W, (435) 797-7120 Th-F or David.Wilson@usu.edu.



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