



Dairy Lameness Research Reveals Perspectives on Treatment

Noted dairy cattle welfare expert Jan Shearer, DVM, MS, Iowa State University, believes it's important that the dairy industry understand how most lameness disorders are treated or managed in North America. Using co-sponsored funds from the AABP Foundation and the Hoof Trimmers Association, Shearer conducted a survey looking at how lame cattle are treated, if treatment causes discomfort/inflammation, and if treatment can lead to residues.

"Funding for our studies permitted us to work on a clinically important issue that is nearly impossible to get support for from other granting agencies or companies," Shearer explains. "Until this study, there has been no documentation of claw lesion treatment practices in the US or Canada. Anecdotal evidence suggests that treatments used by practitioners and hoof trimmers are empirical and we speculate in some cases potentially detrimental."

Shearer's survey was used to document treatment practices by veterinarians and hoof trimmers. "We found that 59% of veterinarians and 53% of hoof trimmers use topical medications on claw lesions," he says. Survey results found that the topical medication used most consistently were tetracycline and oxytetracycline powder, used by 48% of veterinarians and 81% of hoof trimmers.

The use of a bandage or wrap on claw lesions was cited as a routine procedure for 53% of both veterinarians and hoof trimmers. "Of interest is that none of these treatment procedures are supported by information from the literature," Shearer says. "On the contrary, there are no scientific studies documenting a benefit or detriment, for that matter, from topical treatment. Based upon a Cornell study by White et al., bandages are unlikely to provide benefit and may even delay healing of claw lesions."

The study found that lesions from cows treated with oxytetracycline or copper sulfate on day one following treatment had an inflamed surface surrounded by varying amounts of black necrotic debris. Shearer says although there was none of the black-colored debris in lesions from control cows, it was not possible to determine if the degree of inflammation in treated lesions differed from untreated controls based upon visual observation.

Conversely, there was a significant difference in the presence of excessive granulation tissue observed at day 21 for lesions treated with oxytetracycline or copper sulfate and a bandage. "The importance of this observation is that granulation tissue normally indicates delayed healing," Shearer says. "Our speculation is that the granulation tissue observed was a result of increased inflammation associated with the topical treatments applied in this study. If that is true, it suggests that topical treatment with tetracycline or oxytetracycline may be contraindicated for claw lesions."

Preliminary results of observations of a subset of cows in the immediate post-treatment period for discomfort associated with treatment support anecdotal observations that tetracycline and/or oxytetracycline can cause additional discomfort in the early post treatment period. "Reasons for this

may be the acidic nature of these compounds that causes additional discomfort when used topically on claw lesions,” Shearer explains. “We believe this is an important area for continued study.”

In order to determine the likelihood of creating a detectable residue, researchers collected blood and milk samples from 11 cows with claw lesions treated topically with oxytetracycline soluble powder or tetracycline soluble powder. Shearer says all samples had detectable levels of drug. “We also observed that lesions with larger surface areas tended to have higher log-transformed drug concentrations in both plasma and milk. We conclude that topical treatment with either tetracycline or oxytetracycline derivatives is likely to result in detectable residues, but concentrations are well below actionable levels.”

Results may change treatment decisions

The major findings from the study are: 1) topical treatment may increase inflammation and delay healing and recovery rate of claw lesions; 2) topical treatment with tetracycline, oxytetracycline and copper sulfate may increase post-treatment discomfort; and 3) topical tetracycline and oxytetracycline powder formulations may cause detectable residues in plasma and milk.

Shearer’s study included surveying veterinarians and hoof trimmers, and he was pleased by the willingness of busy veterinarians and hoof trimmers to fill out the survey. “A total of 345 people responded to the survey, of which 196 identified themselves as members of AABP, 111 as members of HTA, nine having membership in both organizations, and 29 providing no affiliation. A total of 307 respondents were included in the final analysis.”

Shearer says many of us at times do not take the time to fill out surveys simply because we don’t have the time to do so. “I applaud my colleagues in both organizations for taking the time to do so in our case. There would be no other way to gather this kind of information. The topical treatment of claw diseases study reported here is a good example of clinically relevant research that the Foundation funded but is not usually high on the list of those who normally provide support.”

This research has contributed to other publications, most notably the “Perspectives on the Treatment of Claw Lesions in Cattle”, a refereed article published online in the open-access *Veterinary Medicine: Research and Reports* at http://www.dovepress.com/articles.php?article_id=22410 . This paper reviews the topical treatment of claw lesions and includes recent findings from the work conducted at Iowa State University. The next step is to make sure that this information is made available through other industry publications. Shearer also presented this information at the Hoof Trimmer’s Association meeting in February.

“Our lameness research group at Iowa State is enormously grateful for the AABP Foundation and the Hoof Trimmer’s Association’s support of this project,” Shearer says. “We hope that others will glean insight from our work and expand on our observations. There is indeed, much to be learned about the treatment of claw lesions.”

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