

## **Prevention and Treatment of Digital Dermatitis**

*Dr. William B. Epperson, Extension Dairy Veterinarian, The Ohio State University  
Ohio State University Dairy Newsletter, March 2005*

*Reprinted with permission, Hoof Health Connection, Hoof Trimmers Association, June 2005*

Lameness is an important condition on dairy farms. Dairy farms of midwestern states appear to have a 33% higher prevalence of lameness than dairy farms of the West or Southeast US. Lameness disproportionately affects high producing dairy cows, and has been associated with a 792 lb reduction in 305 day milk yield in one study. Multiple cross-sectional studies indicate that the prevalence of lameness on dairy farms is approximately 22%. That is, at any one time, 22% of cows are lame on the average dairy farm. From field investigations, we have conducted that 30% lameness prevalence is not uncommon on Ohio dairy farms.

Papillomatous Digital Dermatitis (PDD; a.k.a. digital dermatitis, hairy heel warts, heel warts, hairy foot warts, digital warts, strawberry foot, strawberry foot disease, raspberry heel, and interdigital papillomatosis) can be the most common single cause of lameness in a herd. Currently, spirochetes of the genus *Treponema* are regarded as the principle bacteria involved in PDD. Dairy farms have seen a great increase in PDD over the last 10 years, though PDD was described in the early 1970's. Increased risk of PDD in a herd has been found to be associated with herd size, large dairy breeds, addition of outside animals, muddy lots, and generally poor foot hygiene.

Diagnosis of PDD is usually made by observation of feet. The PDD is characteristically located just above the heels on the rear feet. Lesions may extend between the claws, into the interdigital space, and appear on the front side of the foot. The condition is contagious, and lesions are very painful. Photos of lesions can be accessed at <http://www.cowdoc.net/>. Click on foot lameness, then hairy warts.

Herds differ dramatically in response to specific treatment programs for PDD. What works in one herd may not work in another. PDD is generally controlled through use of direct application of antibiotics or disinfectants to the affected area. There are 3 ways to make such an application - directly under a bandage, by topical spray, or through a footbath. Foot bandages need to be removed in 3 days, but response is generally very good. Tetracycline solution has been used under a foot wrap, though other non-antibiotic products have been promoted for use under bandages as well. Topical sprays are applied using a garden sprayer or other spray applicator. Sprays work better if they are applied to a foot free of mud and debris. A wide variety of compounds, both antibiotics and disinfectants, are available that are promoted for use as sprays. Tetracycline and lincomycin are two antibiotics that have been used with good effect in treatment and control of PDD. Twenty to 30 ml of mixed solution is applied to each foot, being sure to cover the affected lesion. Use of these products constitutes an extra-label use, so a veterinarian must be consulted for dosage, application instructions, and warnings. Generally, sprays are applied for 5 days out of 7. This treatment may be repeated as

needed. As always, antibiotics must be used with some caution to avoid milk residues. Proper use of topical antibiotic solutions has not resulted in milk residues to date.

Non-antibiotic (disinfectant) products are also used in PDD control programs. Compared to the antibiotics listed above, disinfectants may require re-dosing at frequent intervals. A number of commercial formulations are available. These products are generally proprietary but are based on organic acids or other GRAS (Generally Regarded As Safe) compounds. Efficacy data may be available on some of these products. Disinfectants including formalin (5%), chlorine bleach, copper sulfate, and zinc sulfate have all been used, often to a limited degree of success.

Footbaths may be used in control and treatment of PDD. In general, traditional footbaths are the least efficacious method of application. Traditional footbaths offer a limited contact time and often become heavily contaminated. There are new footbath systems that manage solutions or allow extended contact time. In traditional footbaths, solutions should be changed when they are grossly contaminated, or for every 150 cows, whichever comes first. Footbaths may be more applicable for routine control, rather than for treatment. Copper sulfate (5 to 10%) and tetracycline (1 to 10 g/liter of finished solution - an extra label use) have been used with moderate success. Producers should carefully consider the cost of application via footbath, as it will often exceed the cost of topical spraying.

A vaccine for PDD is available (Trep Shield HW- Novartis Animal Health). Producers should consult their herd veterinarian for a recommendation on use of this vaccine. Vaccination may best be thought of as an aid to the control of PDD. It appears that vaccination is probably most effective in heifers prior to joining an already infected milking herd. Results have been variable, but it appears that vaccination may help decrease new cases of PDD in unaffected animals and may be of limited benefit to cows already exposed to the organisms. Therefore, consideration of the herd, the magnitude of the problem, and the source and status of replacement heifers should be considered.

In summary, PDD is a serious disease causing lameness in dairy cattle. Currently, *Treponema* bacteria are thought to be the primary agents. Short term control measures focus on the use of antibiotics or disinfectants on feet at some periodic interval. Treatment is best accomplished with foot wraps, topical sprays, and footbaths (in that order). A commercial vaccine is available and has been shown to provide some protection in unexposed heifers. Improving foot hygiene and foot defense are key to long-term control of PDD.