

Clinical Report: Nutritionally Related Foot Problems in a Dairy Herd

Don Gardner, D.V.M.,
Bedford Animal Hospital
Rt. 5, Box 14,
Bedford, Virginia 24523

Feet and leg problems have become of utmost importance in dairy cattle confined 50% or more of their daily time. Besides genetic and traumatic causes of feet and leg problems, nutritional factors have assumed a large proportion of the cause if not major predisposition to the problem in many herds.

The following case history became a nightmare to both veterinarian and owner before it was resolved.

A Holstein dairy farm containing 120 head was begun in Sept. 1976. The facilities were built from scratch upon recommendations from extension people and much personal investigation by the owner operators. The facilities were all under one roof for convenience and economy of construction. The feeding trough ran through the middle of the large housing barn which was divided by the feeding trough so the cattle could be split into 2 groups and fed according to production. The feeding system was a belt model designed so that silage and grain could be fed on one or both sides. The grain concentrate mixture was mixed by a weighing catch hopper before falling onto the belt. By the time the grain-silage mixture hit the bunk it was thoroughly mixed, so very little or no separation could occur in the trough by the cows. The amount of silage and grain being fed was determined by collecting the amount of each conveyed out during a specific time length and weighing it.

The high producing group also had a magnetic feeder available to 1st calf heifers that needed to gain weight and cows producing levels of milk above what the group was being fed.

A large hay loft was constructed above the feeding trough so baled hay could be easily fed by dropping it into the trough.

A holding area was located at the ends of the two groups which led into a double 4 herring bone milking parlor. No feeding was done in the parlor.

Three rows of free stalls were available to each group of cows. An isle lay between the feed trough and a double row of stalls. Another isle was located between the double row of stalls and an outside final row of stalls by the outside wall.

Automatic waterers were located at both ends of the double row of free stalls in each group.

Each group of cows had access to a 10 acre exercise grassy field twice daily after the feed grain mixture had been largely consumed, both morning and night.

Manure removal was facilitated by daily scraping with a "Bobcat" type wheel loader.

This facility would seem to contain most of the requirements of a modern, efficient housing structure for lactating dairy cattle.

The herd was serviced by regular monthly veterinary examinations on a herd health program. Forage testing was regularly done and the service of a private consulting nutritionist were used.

Through the fall, winter and spring of 1976-77 a fairly healthy herd was maintained. Routine problems were handled and usually responded to treatment. Occasionally corns would develop and foot rot would set in when they became eroded, but the number of cows affected was not very large.

In the month of July it became apparent that a problem had developed that was not usual. Six to eight cows became affected with subsolar abscesses and heel abscesses. Erosions were visible on the posterior area of the heel and in the area of the junction of the heel and sole. The erosions looked like the horny tissue covering the foot had been dissolved by chemical action. Separation of the sole and heel in a blister like cavity forming under the sole or heel. A break would ultimately result somewhere in the horny covering of the foot and infection would result in the sensitive tissue by organisms in manure. These damaged feet were treated by trimming out the damaged sole and heel so drainage could occur. Plaster casts or wooden blocks affixed with epoxy resin were used to elevate the affected claw off the ground so weight would be borne on the good claw. Infection was treated by oral sulfadimethoxine (Albon) for 4-5 days. Most cows so treated usually returned to production with only production loss during treatment sustained. They never returned to their earlier level of production, however, and several cows that had problems with several feet had to be culled because of complete production loss. Most of these cows lost considerable weight because they didn't feel like hustling at the trough like the rest of the herd.

After these problems became apparent, a thorough investigation of the facilities, cows and feeding program was made.

The summer of 1977 was unbearably hot in this area and cows were not going out of the barn during the day but were spending most of their time standing in the barn in the isles, panting. An examination of the free stalls showed they were filled up level with a finely crushed limestone meal which had become hand packed and had a very thin layer on top of loose abrasive material. Sawdust had been used previously

but some mastitis cases were blamed on it so a switch to the fine crushed rock was made. In the beginning it had been soft and loose but as time had passed it became very hard and uncomfortable. Cows were noticed that had calluses and fluid filled subcutaneous bursae on the lateral sides of their hocks so it became apparent that the stalls had become very uncomfortable.

Since the erosions of the horny outer keratin covering looking like they were being chemically dissolved, a pH check was made of the slurry in the isles where the cattle were standing. The pH was quite alkaline being 8.5 to 9. This was felt to be contributing to the erosions of the bottom surface of the feet.

The feeding program had been changed in May from corn silage to alfalfa silage. The protein level had been adjusted in the grain concentrate down from a 20% to a final level of 12% over a period of 3 feed mixings taking it down 2% increments at a time. Eight pounds of alfalfa hay were also being fed. A fiber level was being maintained at what is thought to be acceptable minimum limits i.e. 19-20% on a dry matter basis. The low group of cows was being fed 16 pounds of grain conc. in the silage mix per head per day and the high group 22 pounds per head per day to balance out their requirements. High producers also had access to a magnetic feeder if they were milking above what their requirements were being met in the group feeding. Approximately 50-60 pounds of silage per head per day were being fed.

Since the feeding program seemed to be in order, it was assumed the problem lay in uncomfortable free stalls with cows not getting out of the barn off concrete and spending excessive time standing in a very alkaline manure slurry. Recommendations were made to replace the hard, crushed rock, filled free stalls with 6 inch deep fill of sawdust. The cows were to be driven out of the barn for 6 hours after consuming their morning feeding and again after their nightly feeding on to the sod exercise field. Barn isles were to be scraped twice daily instead of once daily to try to decrease the amount of slurry the cows were standing in.

After putting these management changes into effect it was noticed that the cows began to use the free stalls a lot more and it was hoped that the problem was solved.

Such was not the case. Over the course of the next month we had to work on 10-15 more cows with feet badly damaged as previously described. Also it was noticed that the sole of the feet was growing extremely fast and the keratinous material was very soft and irregular in growth almost like you would see in the feet of a chronically foundered horse or pony.

There were two main possible reasons for our calamity. The first was uncomfortable free stalls and second was too high level of concentrate feeding in relationship to the fiber level of the ration on a dry matter basis.

Again the nutritionist examined the feeding program and all levels of nutrients were found to be at acceptable levels in his recommendations to the operator.

Since it was felt that the problem was indeed an

overfeeding or founder problem a thorough on the farm investigation was initiated and all areas from procurement of raw materials, mixing and delivery of feed to the cows were checked and recorded to see if recommendations were being followed.

In June wheat had been added to the ration to replace some of the ground ear corn that the owner raised because of the favorable price of wheat over corn. Correct amounts of each ingredient were being added to the concentrate ration and it was found to contain the correct protein percentage. However, the automatic system that delivered the mix from the bin to the belt had not been recalibrated and reset to compensate for an increased density of the ration. It was found that the delivery system was putting out significantly more grain in the same time it had previously put out the recommended amount due to an increase in the weight to volume ration in the concentrate. On a per head basis the high group of cows were being fed 32 pounds of concentrate per day instead of 22 pounds plus access to a magnetic feeder. This had caused a chronic founder that was causing a poor quality hoof to be formed that was easily bruised by prolonged standing on concrete. It was easily penetrated by stone particles and easily eroded by the alkaline slurry of the manure.

During this period there had not been more than an occasional cow off feed one might expect with this type of situation due to acidosis. During July NaHCO_3 and MgO_2 had been added to the concentrate ration to increase the butterfat level which had dropped 0.8% during the hot weather. I feel this is what kept the cows from getting sick but did not prevent the foot problems.

At the same time the delivery system was recalibrated a foot bath was installed in the return alley from the milking parlor so the cows could walk through a CuSO_4 foot bath. It was hoped this might help hold down some of the infection in the many damaged feet.

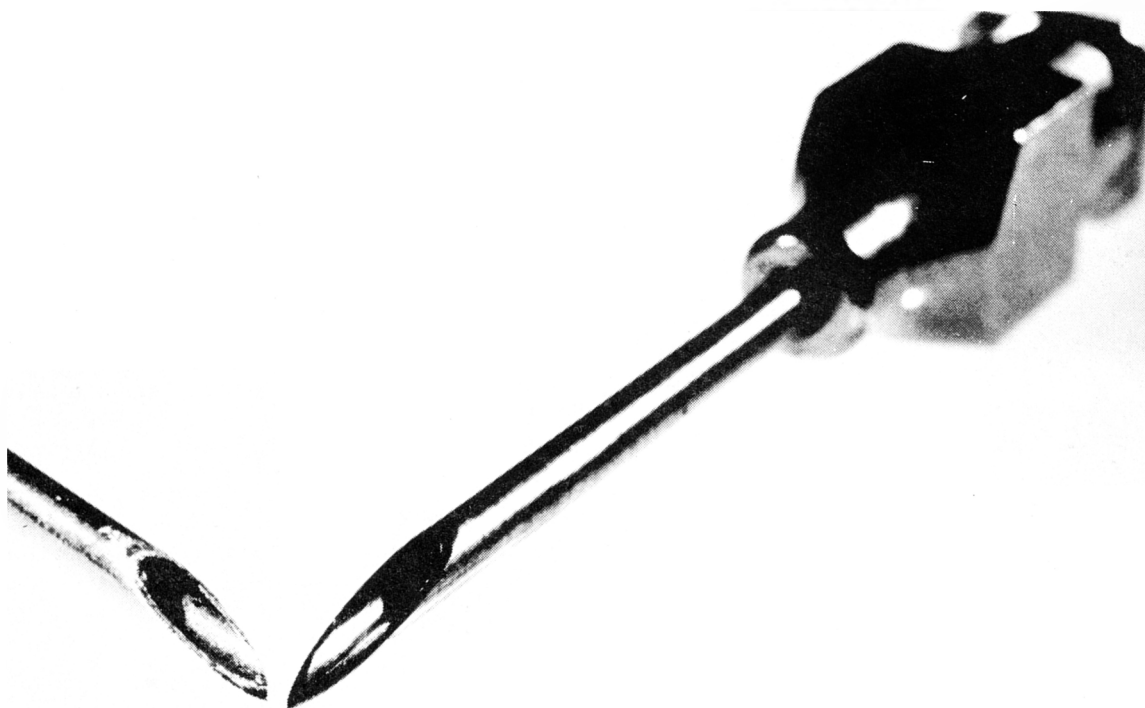
One might think that to have had this big increase in feed usage would have been obvious to the farm management. The trouble lay in there being one group of men that ground the feed and got it out of the bulk housing on the farm and were simply in charge of keeping the feed bins full. Personnel that looked after and fed the cows were different people.

This case illustrates why a veterinarian doing a dairy herd health practice must have a good working knowledge of nutrition and its effect upon all the ramifications of cow health. Also it is essential that he should have a good working knowledge of the equipment and management problems of a dairy farm. Many times problems come from a producer not having the proper recommendations. Often, however, the problem comes from improper implementation of good recommendations at the farm level.

After getting the ration amounts corrected to the levels suggested by the nutritionist, the foot problems slowed down to 3 per month during the following 2 months and we have had very few since.

The Hypodermic Needle that surpasses all others!!!!

The cislak *Smooth-point*[®] *husky*
hub[®] Needle



Compare the **cislak *Smooth-point***[®] with the competitor's needle
(unretouched photograph)

**The stainless steel smooth-point needle with
the chrome-plated, brass hub features:**



Gentle, smooth point



**Husky Hub - easy to grasp -
will not slip**



**Fits Luer lock and
Luer slip adaptors**



Lower priced to save you money

Get your **cislak *Smooth-point***[®] *husky*
hub[®] NEEDLE from your favorite
veterinary supplier. It is sold in popular gauges and lengths.

Names of Suppliers can be obtained from:

F.W. Cislak Manufacturing & Engineering Co., Inc.
5768 West 77th Street, Burbank, Illinois 60459

Telephone: 312-458-6163

® Trademark