

Care of the Foot of the Dairy Cow

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The dairy cow's foot has received little attention until very recently and those who have worked with cattle lamenesses have worked in relative obscurity. These conditions are no longer true and the bovine lameness specialist is being accorded his rightful place in the veterinary profession. A recent week-long seminar in Utrecht, Holland on cattle foot lameness attended by 20 invited specialists from around the world; the book, *Cattle Lameness*, by Greenough, MacCallum and Weaver; and the statement by a Wisconsin bovine practitioner, "If you won't treat their lame cattle you won't be called to treat their other disease problems," all attest to the widespread recognition of dairy cattle foot problems.

Many of the dairy cattle type considerations thought to be so important just a few years ago have either been discarded completely or greatly deemphasized, but sound feet and legs are receiving even greater emphasis by dairy cattle breeders and show-ring judges.

Dairy cattle foot lameness has always been a problem but the incidence is greater today because of faulty breeding practices, confinement of dairy cattle on concrete, feeding more concentrate and feeding less roughage, especially long hay.

Dairy cattle breeders have long abhorred sickle-hocked cows because they didn't look pretty and their heels may have been more subject to bruising. The advent of artificial insemination provided them with a tool to bring about more rapid changes in dairy cattle type and one of their major objectives was straight rear legs. Their efforts have met with amazing success as is attested to by the great number of post-legged dairy cows in the country. Some breeders are just now realizing that post legs may be even less desirable than sickle hocks since the post leg results in trauma to all parts of the limb from the sole of the foot to the acetabulum. Sickle hocks, weak pasterns and shallow heels are, of course, no more acceptable today than in the past.

Confinement of dairy cows in free stalls and concrete walkways kept moist with automatic manure scrapers has resulted in high moisture necrosis of the sole with ulcerations, traumatic injury of the sole that also develops into ulcerations and overgrown hooves.

Feeding increasing amounts of grain and less roughage in an effort to produce more milk attains the objective for a time but eventually the practice results in a breakdown of many body systems. The breakdown may be due to a deficiency of certain essential nutrients but I believe the basic problem is

attempting to feed the dairy cow as a simple stomach animal rather than a ruminant. She does not receive an adequate amount of total fiber and/or long fiber to permit normal function of her digestive tract. Laminitis and general impairment of the integrity of the hoof result.

Seventeen percent fiber appears to be an absolute minimum and 19% is probably a safer level. I recommend that lactating cows receive at least 6 pounds of long hay per day and object to corn silage as the only roughage for an extended period of time. Some herds can maintain a high level of production and good general health, including good foot health, for several years but difficulties have nearly always arisen in herds under my supervision when they persist in feeding silage as the only roughage.

Proper mineral feeding of the dairy cow is essential to good foot health. She must receive adequate calcium and phosphorus in her diet, at least 0.70% Ca (some nutritionalists recommend more) and 0.50% P in the total ration is frequently recommended.

When the dairy herd is confined during lactation and high grain feeding is practiced, I strongly urge clients to give dry cows some relief from confinement and high grain feeding during the dry period. They are encouraged to remove the animals from concrete floors to ground surfaces and provide them with pasture, long hay and very little grain. This rest period gives the feet and digestive system an opportunity to recuperate from the stresses experienced during lactation and prepares them for the next lactation. I believe the "steaming up" procedures practiced a few years ago during the dry period are harmful to the general health and longevity of the dairy cow and should no longer be followed.

Exercise lots should be provided for dairy cows. When they are confined to a free stall barn with small concreted holding and feeding areas and scraped clean every hour by an automatic scraper, the feet are constantly bathed in manure and urine. Within a year or two the hoof softens, heel fissures develop, sole ulcerations appear and hoof growth accelerates.

Animals soon become extremely lame, milk production drops, and general health deteriorates. Ground lots are preferred but such surfaces soon become quagmires in seasons of high rainfall if numerous cattle are confined to a small area.

Some solutions are adequate drainage, creating mounds, spreading crushed rock, applying 4 tons of lime per acre, concreting heavily-used portions of the lot and increasing the lot size. Under no circumstances should coal cinders be applied to the surface because sharp cinders lodge in the interdigital space where they lacerate soft tissues and severe infections (interdigital pododermatitis) develop.

In view of the above, care of the foot of the dairy cow must begin when purchasing foundation animals and planning matings. Proper weight bearing of the

foot due to the genetic make-up of the animal is essential if dairy cows are to remain sound on their feet. No amount of foot care can completely compensate for an inherited foot abnormality. When heifer calves reach six months of age their feet should be examined and trimmed, especially if they are confined on soft footing such as built-up litter. Heifers should have exercise if they are to develop strong feet and legs. Lack of exercise often results in weak pasterns and widespread claws. We do not all have the opportunity to pasture our yearling heifers in the Alps Mountains as do the Swiss breeders who attribute the excellent feet and legs of their cattle to this experience, but we can and should provide an opportunity for some exercise. Most yearling heifers should have their feet trimmed at least once if they are confined, but it is usually not necessary if they are grazing. When heifers are added to the milking herd as two-year-olds, an excellent opportunity arises to examine their feet for abnormalities and attempt corrective trimming if indicated.

Confined cattle will probably benefit from foot trimming at this time and at least once a year thereafter for the remainder of their lives. It must be remembered that although corrective foot trimming is a very helpful procedure and will correct some abnormalities of the foot, it will not correct all abnormalities. Professional foot trimmers are available and clients should be encouraged to employ them but many dairymen have not yet become convinced that foot trimming is one of the necessary costs of production for confined dairy cattle. Feet should be trimmed as short as possible without penetrating the sole or making the sole so thin that the first sharp stone will penetrate it.

In general, the medial claw is trimmed slightly shorter than the lateral claw and the axial surface of the sole trimmed shorter than the abaxial surface. The objective is to trim the claws so that the hoof wall bears most of the weight and the sole absorbs most of the concussion. When the claws are properly trimmed each claw will bear an equal amount of weight.

Hoof trimming can be performed with the cow in the standing position, cast on the ground or restrained on a tilt table. The author prefers a tilt table but this facility is not always available and other restraint becomes necessary. Usual trimming equipment consists of long-handled hoof nippers, search knives (hoof knife), Allgau knife (hoof chisel), electric sander and a good pair of leather gloves. The author prefers to perform the basic portion of the surgery with the long-handled nippers, explore tracts and remove overlapping tissues or loose strands with a hoof knife and smooth the weight-bearing surface with the sander. Excessive use of the sander on the sole should be avoided because it may heat the tissues to a degree that produces necrosis.

If the dairy cow is born with normal foot structure, properly fed, properly housed and has her feet trimmed when needed, she will have a minimum number of foot problems. However, in spite of all these

precautions foot problems do occur.

If these problems are to be given proper care an accurate diagnosis must be made. A complete history and thorough examination are essential steps in arriving at an accurate diagnosis. Once the diagnosis is made, treatment and care are usually obvious.

If a foreign body is found, it of course must be removed, the local wound treated and systemic antibacterials administered when indicated.

Ulcerations of the sole are often extremely difficult to treat but acceptable treatment consists of surgical removal of the prolapsed pododerm, very close trimming of the sole, cautery of the lesion with antimony trichloride and application of a protective bandage. A wood shoe attached to the sound claw will relieve the affected claw from bearing weight and frequent irritation so that healing can occur. After the bandage has been in place for one week it is removed and copper sulphate (a mild escharotic) is applied to the lesion at least once each day. Healing takes place more rapidly if the cow can be confined in a small grass lot.

When infectious pododermatitis (foot rot) develops in a herd, individual treatment is indicated. The author prefers intravenous sulfonamide therapy and protective bandaging of the irritated interdigital tissues. A 50% copper sulfate or 2% formalin footbath at the milking parlor exit will help to stop an epizootic. The foot bath is palced at the exit so some of the manure and dirt can be washed off of the feet in the milking parlor and the bath can be used for a longer period of time without recharging it. Oral iodides have not been highly successful when the author has used them for treatment or prevention of infectious pododermatitis. Herds treated with oral iodides for a prolonged period of time have developed a chronic upper respiratory irritation and cough that disappeared when iodine therapy was discontinued.

Vertical hoof fissures are best treated by drilling out the damaged tissue, drilling holes at right angles to the fissure and lacing across the fissures with umbilical tape. The area is then filled with acrylic and acrylic placed on the hoof wall in such a manner that the fissure does not expand with weight bearing. In severe lameness cases due to hoof fissures a wood shoe is placed on the sound claw so the affected claw does not bear weight and healing can occur. Plaster of paris can be used instead of a wood block but it only lasts for approximately one or two weeks while the wood block may persist for months.

Dairy cows do not suffer from vegetative interdigital dermatitis (corn) as frequently as beef cattle, but when the mass appears it is more likely to affect all four feet. Surgical removal is the preferred method of treatment. If the underlying fat pad is removed the condition rarely reappears.

The specific foot abnormalities that can produce lameness are too numerous to include all of them in this paper but it is hoped that the above examples of the various types will assist the reader in applying foot care principles to prevention, control and treatment of dairy cattle foot lamenesses.