Dairy Cow Foot and Leg Problems on New Concrete

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There have been several questions recently regarding problems with feet and legs of dairy cows that have been put into new free-stall barns. The problems are described as lameness, sore or tender feet, and excessive hoof wear-all of which can result in veterinary treatment and/or loss of animals. These problems occur within one to two weeks after cows are put onto the new floor. Possible causes for these foot problems are physical abrasion due to the roughness of the concrete, chemical burning by the new cement, or stress-induced laminitis that results from the high stress experienced by animals when they move into a new facility.

Of the possible causes for foot problems in new buildings, initial concrete surface roughness is the most likely. The newly finished concrete surface has many high sharp edges (like sandpaper). Just run your hand over the surface to find out how rough the surface is, but be careful you don't get scraped knuckles! Concrete roughness will be reduced over time by animal and vehicle traffic, but the initial roughness can be minimized by proper placement and finishing of a quality concrete mix.

Exposed aggregate and rough spots in poorly placed and finished concrete can also cause problems. Uneven pressure on the hoof from the exposed stones and from high or low spots can cause poor footing and bruising and abrasion of the hoof. Smooth floors can be as much of a problem as rough floors. There is a fine line between a floor surface that is too rough and causes injury due to abrasion and one that is too smooth and causes injury due to inadequate footing. Concrete floors must have an adequate texture for good footing.

Providing an appropriate alley floor surface is the first and best course of action for preventing foot and leg problems. The walking alleys for the cows should be placed as soon as possible in a building project schedule to allow proper curing of the floor surface before cattle are moved into the barn. Quality concrete should have a minimum compressive strength of 3500 psi and should be moist-cured for a minimum of 28 days. Although this seems like a long time, most large projects will take at least this long to complete. Placing floors as early as possible in the building schedule will reduce the problem of waiting to put cows into a completed building because the concrete is not ready.

Proper floating and surface finishing of the floor are essential. No matter how good the initial concrete finishing, rough edges can develop during the grooving process. These rough edges should be knocked down before cattle are allowed onto the floor. Many builders like to float grooves into the floor as it is placed. This is usually done with a float that has formed rods built into it. There are a variety of groove designs including square,

triangle, diamond, and round cross sections. The important criteria are the spacing and sizing of the grooves. The MidWest Plan Service *Dairy Free-Stall Housing Handbook, MWPS-7*, suggests that the grooves be sized 1/2 to 1-inch wide, up to three inches deep, 3 to 4-inches on-center and formed parallel to the direction of scraping (usually the length of the alley). Diamond patterns can be used for grooves in areas of cross traffic such as holding areas or cross alleys. Diamonds can be up to 6 inches on-center.

I checked with several builders to see if their customers have had cow foot and leg problems in new barns. Most builders said they were not common, but when there was a problem, they usually acted immediately to remove some of the surface roughness.

Here are several corrective actions to reduce concrete surface roughness:

- Knock off the high sharp edges of the new concrete by dragging concrete blocks or a concrete slab over the surface. Using concrete is better using than steel because steel could polish the floor excessively.
- Scrape the surface with a skid-steer or front-end loader and blade. A rubber tire scraper probably won't accomplish adequate smoothing of the floor. Be careful to not polish the floor.
- Consider surface grinding the floor. This option might be expensive, so limit grinding to small floor areas where the concern about roughness is greatest.
- Spread manure over the surface to lubricate the floor and reduce exposure to the rough concrete.
- Build a manure pack to cover the surface roughness. This provides immediate but only temporary relief until the surface can be improved.

Dairy scientists suggest several other management measures to prevent or reduce animal hoof injury:

- Trim hooves on cows going into a new facility six to eight weeks before the cows are moved. Adequate sole thickness is needed to withstand a rough floor surface.
- Make sure cow hooves are as hard as possible before moving to a new barn floor. Cows on pasture might have softer hooves that cannot withstand long exposure to new concrete. Cows presently on concrete might have harder hooves that can withstand more exposure to new concrete.
- Expose cow groups to new concrete for short periods of time over the course of a month.
- Move heifers or groups of cows onto new concrete for short periods of time and rotate groups into and out of a new facility. This reduces exposure of individual animals to the rough concrete.
- Lay rubber belting on alley floors to protect cows' feet. This can also be done in the feed alley near the bunk to provide cow comfort and encourage dry matter intake.
- Provide two footbaths to treat hooves, if necessary. The first footbath usually contains water only and is used to clean hooves before exposing them to the

medicated solution in the second footbath. Consult a veterinarian to decide on what solutions to use.

A secondary concern with new floors is the possibility of chemical burning caused by the new concrete surface. Portland cement has a high pH (basic) and poorly finished floors can actually cause chemical irritation of cows' feet. If new concrete is in fact causing chemical burning, washing the floor with muriatic acid (as you would before coating or painting the concrete) might help.
