

Adapting To Life On Concrete

Editor's Note: The following is adapted from the Hoof Trimmers Association Newsletter.

Modern dairy cattle evolved from nomadic animals that walked on resilient, yielding surfaces. Dairy producers first confined cows on dirt or generous amounts of soft bedding. Reports indicate that even in these early confinement settings, cows' hooves did not wear properly. The next development in dairy housing confined cows in stanchion barns during adverse weather to avoid the wet and dirty conditions associated with most outside dirt lots. In the summer, cows were almost always pastured and seldom experienced major foot and leg problems.

Recently, economic pressures have forced many dairy producers to intensely confine cows even more. Freestall housing systems are popular today because they can provide a quality cow environment while minimizing the amount of bedding and labor required, compared to other loose housing systems.

Confining cows in freestall barns means they almost always stand or walk on scraped or washed concrete alleys during each lactation, or possibly even their entire adult life. Sometimes resting surfaces are also constructed from concrete, so cows get little reprieve, especially if the stall is inadequately bedded or incorrect dimensions discourage or even prohibit them from lying down.

Many producers and scientists rapidly accepted intense animal confinement despite the lack of adequate data on its long-term effects on cows. Today, the industry continues to embrace this housing system even though there has been little progress in cow comfort and health relative to flooring surfaces in this country.

However, in Europe where animal welfare is a primary concern, foot and leg health has attracted significant attention and has driven their scientists to look more closely at the impacts of hoof contact surfaces.

Concrete Damages Hooves

Cows should ideally lie in stalls for about 14 hours a day, according to various experts. This then means they will stand or walk about 10 hours per day. Cows are motivated to walk to consume food and water, and seek companionship, shelter, resting space and sexual partners. Dairy producers make cows walk to and from milking, sorting and treatment areas.

Moderate walking is good for cows, according to Dr. Albright of Purdue University. He suggests cows need to walk two to 2.5 miles per day to keep healthy and exercised.

Concrete causes hoof damage two ways, from its abrasiveness and the repeated concussion from its unyielding nature. European researchers have found that excessive walking on abrasive concrete can lead to over-worn soles that become soft and bruise easily, and excessive standing reduces blood flow in the hoof, deteriorates hoof health and leads to hoof lesions.

Concrete floors that are roughened or textured to prevent slippage can excessively wear hooves in cases of over exposure, whereas non-grooved smooth floors simply do not offer sufficient traction.

There is a fine line between a concrete floor surface that is too rough and injures cows from high exposure rates and its abrasiveness, and one that is too smooth and causes injury because of inadequate footing.

Experience has shown that the floor finish is often the biggest mistake made during barn construction. David Bray of the University of Florida reported in 1998 that rough finished floors speed hoof wear up to 20 percent, with cows being culled due to lameness within three weeks of occupying a new barn.

North Carolina State University (NCSU) research indicated that the hooves of cows confined on new abrasive concrete wore 35 percent more than control cows housed on dirt. NCSU also reports that the hooves of all cows confined on a new concrete surface with no special surface preparation wore more than they grew for the first two months of exposure.

Like people, foot and leg stress increases for cows when they stand on concrete for extended periods of time. Dr. Chuck Guard, veterinarian of Cornell University, reports that dairy cows' claws are commonly shaped in less than desirable forms and these misshapen claws will experience extreme localized pressures from the unforgiving concrete. This high pressure significantly damages the underlying hoof structures. Dr. Bee and others of the United Kingdom reported that herds fed low levels of concentrates with poor concrete surfaces and low freestall use saw a high incidence of sole ulcers and white-line disease.

Water Quality Concerns Will Affect Reprieve From Concrete

Many producers who have confinement facilities recognize the stress cows endure from standing on concrete and consequently, try to give cows a reprieve by moving them to managed-grass areas or earthen lots during the dry period. Studies have shown this is beneficial to foot and leg health. However, this practice may not be sustainable.

Environment policy in the United States is now concentrating on new regulations to protect the nation's water resources from point source (wastewater discharge from a pipe) and non-point source (surface runoff) agricultural pollution.

These regulations will significantly impact dairy cattle housing. Most producers probably will not be able to allow their cattle to freely use intensive exercise lots unless they collect and treat surface-water runoff.

I believe due to the economic and environmental factors, many producers who have not already done so will opt to expand the level of confined housing to include their entire herds and forgo constructing and operating expensive rainwater runoff collection and treatment systems for exercise areas.

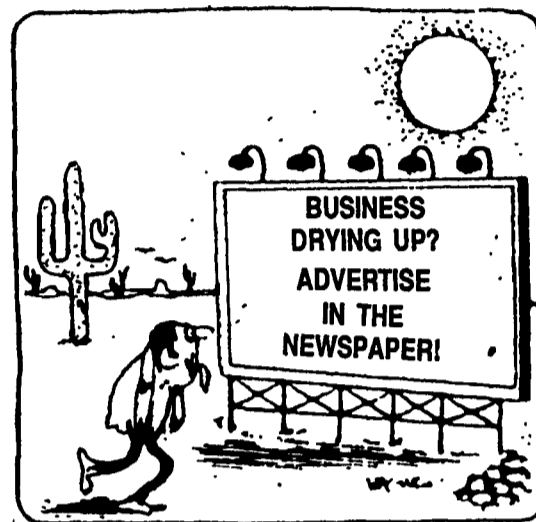
This will happen despite research by Drs. McDaniel and Hahn and others at NCSU that shows providing a break from concrete during the dry period for confined cows is beneficial to overall foot and leg health.

Consequently, researchers and industry investigate new flooring surfaces to better meet the cows' and dairy producers' needs. Ideally, floors must provide confident footing for the

cow and caretaker alike, but cause minimal foot and leg problems for the cow. Also, floors must be affordable and durable.

Alternative Surfaces Key To Lifelong Confinement

Concrete is an attractive flooring choice to builders because it is durable, economical, easy to place, conforms well to irregular areas and can be finished in various ways that provide some level of traction that is usually acceptable to dairy producers. But it is very unyielding and contributes to lameness. Dr. Guard suggests barn floors should be surfaced with something other than concrete and that, combined with routine hoof trimming, may prevent many cases of severe lameness.



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