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UNIVERSITY OF KENTUCKY
College of Agriculture, Food and Environment

Increasing Dry Cow and Bred Heifer Performance with Environmental Management

Steve Higgins and Kylie Schmidt, Biosystems and Agricultural Engineering

Producing high-quality milk is a primary concern of dairy farmers, which is why the production herd often receives more attention than the dry cows and bred heifers. However, it is important that dairy producers not lose sight of the great value that their dry cows and bred heifers hold: the future of the milking herd. Environmental management practices such as rotational grazing, heavy-use area pads for feeding and watering, and shelter can be used to increase close-up cows' future performance by preventing mastitis and other health disorders such as lameness.

Research has shown that the care and comfort of the dry cow and bred heifer influences the health and production of the cow after calving. Dry cows with suboptimal health are seven times more likely to experience foot problems when they return to lactation and have an increased risk of dystocia (difficult calving). Dry cows are already the most vulnerable to new mastitis infections, particularly in the two weeks before and after calving. Poor management, which leads to suboptimal environments, can exacerbate these health risks. Producers must understand that dry cows and bred heifers are the next milking herd, so focusing on their management can maintain or actually increase future profitability. This publication focuses on environmental management strategies that improve dry cow and bred heifer performance.

Rotational Grazing

A rotational grazing system subdivides larger pastures into smaller pastures so they can be alternately rested and grazed. Cows move from one pasture to an adjacent pasture after the vegetation is grazed to approximately three to four inches in height. After 30 days or adequate regrowth, cattle can re-enter the previously grazed pasture. Unlike a continually grazed system, rotational grazing offers many production and environmental benefits.

From a production standpoint, rotational grazing greatly increases forage quality by increasing plant diversity. Forage yield also is improved by reducing weeds. A diversity of forage provides more optimal nutrition that can lead to increased weight gain and milk production while lowering feed costs.

A rotational grazing system maintains vegetative cover. Actively growing vegetation can take up nutrients and hold soil in place, which helps prevent pasture erosion and the creation of mud. Less mud can reduce the cases of mastitis and ultimately reduce the need for medication. Limiting the creation of mud also will decrease susceptibility to foot rot and udder infection. Rotational grazing can also limit excess nutrients and sediment from moving offsite into water resources.

In a rotational grazing system, access to a water source is needed in every pasture. City water sources are ideal. Cattle should not be allowed to have access to surface water sources (e.g. streams, ponds, drainages, etc.), because they could become infected with waterborne diseases or toxic substances, leading to a wide range of possible health problems. By incorporating alternative water sources constructed using a concrete platform and heavy-traffic pad, cattle will have a reliable clean water supply without the associated environmental damage.

For information on how to establish a rotational grazing system, see the University of Kentucky Cooperative Extension publication Rotational Grazing (ID-143).

All-Weather Surfaces

Kentucky is well-known for its ability to produce forages, but the climate is not conducive to 365 days of grazing, especially during the winter. All-weather surfaces are needed to control the creation of mud. All-weather surfaces are impervious surfaces that provide a mud-free location for cattle to feed during inclement weather, thus saving pasture, reducing feed costs, and preventing sediment and nutrients from running off and polluting water resources.

Two common all-weather surfaces are concrete and a combination of geotextile fabric and rock, known as a heavy-traffic pad. Concrete is the most durable all-weather surface and the best surface to use if the area is going to be scraped with a blade or loader bucket to remove manure. Heavy-traffic pads are generally cheaper to install than concrete. However, if the area will be scraped often, the producer should consider installing concrete. Concrete is easier to scrape clean and lasts longer if properly installed.

In some cases, using a combination of concrete and heavy-traffic pads can create an optimal area for limiting the creation of mud. Feed bunks work well with this combination. The cattle's side of the area is concrete and the farm implement side is a heavy-traffic pad. Another practical location of multi-surfaces is the area surrounding a watering fountain, where concrete is used around the fountain and a heavy-traffic pad is used to extend the all-weather surface to create a larger hardened area. In both cases, the concrete should be grooved with a broom finish to provide more traction for animals and reduce slippage.

Dry lots constructed using a heavy-traffic pad are a great addition to a rotational grazing system (Figure 1). When using a dry lot with a rotational grazing system, the dry lot should be accessible by all adjacent pastures and be placed as far away as possible from environmentally sensitive areas such as sinkholes and streams. A watering fountain can either be placed within the dry lot or away from it to lessen the amount of loafing and reduce the volume of manure that would need to be managed. Approaches to the dry lot, gate openings, lanes, and other heavily used areas should be hardened with heavy-traffic pads constructed of geotextile fabric and compacted rock.

For information on how to construct a dry lot or other heavy-use area surfaces, see the University of Kentucky Cooperative Extension publications Using Dry Lots to Conserve Pastures and Reduce Pollution Potential (ID-171) and Appropriate All-Weather Surfaces for Livestock Traffic (AEN-115).

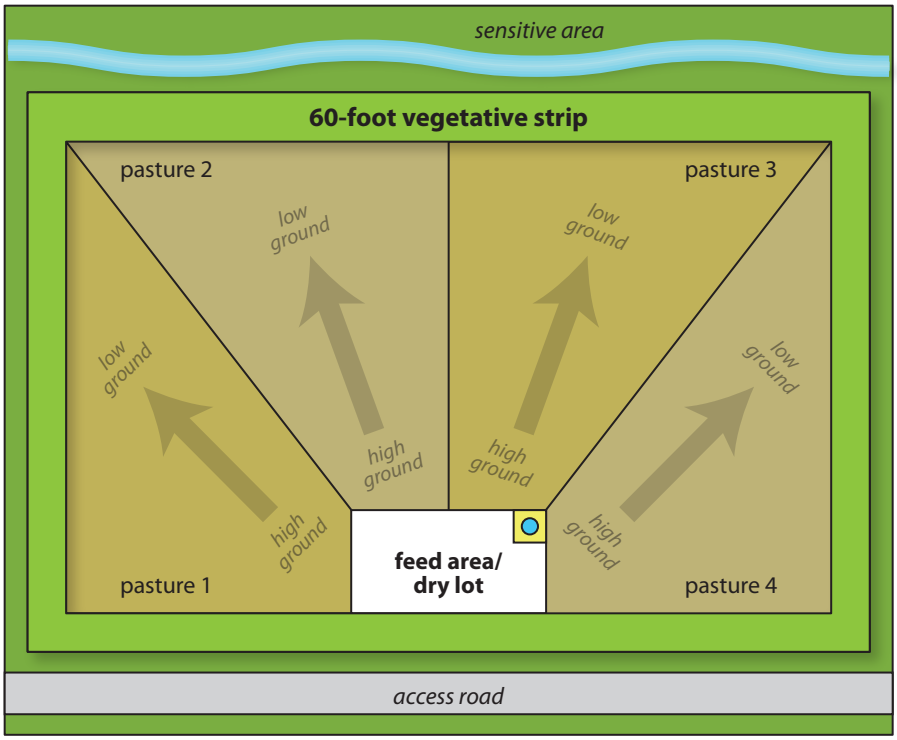


Figure 1. This diagram shows an ideal rotational grazing system with an adjacent dry lot. Source: Donnie Stamper, Biosystems and Agricultural Engineering.

Shelter

Structures provide cattle with much needed shelter during bad weather and extreme heat. Cattle are cold-climate animals that are more stressed by heat than by cold. Cattle may begin to experience heat stress when the thermal heat index is over 68 degrees Fahrenheit. Heat stress will depend on a number of environmental factors including relative humidity, solar radiation, wind speed, access to water, and diet. Bare soil areas with limited vegetation average seven degrees Fahrenheit higher than adjacent thick-grass pastures; shade structures are critical in these areas to reduce heat stress. Conversely, freezing rain or rain combined with cold winter winds can be stressful for cattle.

Shelter is especially important during calving. From a systems design standpoint, having the shelter as part of the dry lot would facilitate checking on the cattle. Close-up dry cows should be provided with a structure or some type of protection for calving in the event of inclement weather. Three-sided barns should open to the east to allow the morning sun to dry the inside of the barn, but not create excessive heat. The shelter floor should be made of concrete to facilitate cleaning, but should also be covered with a bedding material to provide proper cow comfort. To avoid the detrimental effects of high temperatures and humidity, the barn should provide adequate ventilation using mechanical fans, ridge vents, or a cooling system such as sprinklers. It is imperative to keep calving shelters clean and freshly bedded to prevent mastitis and infections in newborn calves.

In addition to a three-sided barn in the dry lot, portable shade structures in pastures can be used for shelter on summit positions. Cattle congregation under shade trees can lead to the development of manure pack—depressions that pool water, creating unsanitary conditions. These conditions can attract flies, leading to pinkeye and mastitis. Portable shade structures are recommended so producers can move the structures and remove the unsanitary manure pack. Periodic relocation of the structure also helps prevent compaction and depressions from developing. For more information about the various options used to provide shade for cattle, see University of Kentucky Cooperative Extension publication Shade Options for Grazing Cattle (AEN-99).

Summary

When inclement weather and animal congregation create mud in pastures, it requires more energy for the animal to move, thus lowering the net calories gained from feed intake. Managing close-up dry cows and bred heifers to keep them dry and clean is essential for health and productivity. The dry lot/rotational grazing system provides grass and all-weather surfaces to keep animals dry and reduce the creation of mud. Shelters provide protection from extreme weather and reduce animal stress. Incorporating these practices into the production system can save feed, improve herd health, and reduce medication costs by preventing mastitis and other health problems. Healthy dry cows and bred heifers ensure a healthy, productive milking herd in the near future.

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