

Nonnutritional Factors Influencing Response to the Nutritional Program



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• Facilities • Dairy shelter • Heat abatement • Feed bunk • Feeding area

KEY POINTS

- The design and management of each animal shelter component (feeding, resting, drinking, floor surface, ventilation) can influence the willingness and ability for dairy cows to consume an adequate amount of dry matter.
- The design of the feeding area should provide a comfortable feeding experience for cows and convenient management for the caretaker.
- Good animal shelter and feeding area design cannot make up for poor (or varying) feed quality or poor management.
- Existing facility components that influence feed consumption can usually be improved.
- Heat stress can adversely affect feed intake, rumination, and metabolic status, resulting in greater predisposition to disease conditions.
- Heat abatement strategies should first focus on cooling cows in stalls, then address the feeding area.

ANIMAL SHELTER DESIGN BASICS

Clean, healthy, productive dairy cows require at least 5 basic elements from a dairy shelter. They include:

- Excellent air quality
- A clean, dry, comfortable resting area

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- Convenient access to (and supply of) good-quality feed
- Convenient access to (and supply of) good-quality water
- Confident footing

These elements provide the opportunity for cows to be productive and must not be compromised in dairy shelter design. Proper design and management of a dairy shelter (not just the feeding area) is necessary for dairy cows to take full advantage of a ration that has been carefully balanced, formulated, prepared, and delivered. Altered feeding behavior pre partum is associated with greater risk for metritis¹ and subclinical ketosis,² although cows experiencing a range of postpartum diseases showed lower prepartum intake compared with healthy cows.^{3,4} Competition for feed bunk space, because of overcrowding or poor design, may result in sorting⁵ or altered animal behavioral responses,⁶ predisposing primiparous or submissive cows to diseases. In many ways, facility design can make or break the quality of a nutritional program. In this article, some design considerations for the feeding and drinking water areas are described, as well as other factors that may influence feed intake and animal health in freestall shelters.

FACTORS INFLUENCING FEED INTAKE

Although good design of the feeding and drinking water areas is important, it is not the only factor that may prevent or discourage dairy cows from consuming a desired (or expected) amount of dry matter. The following factors contribute to reduced feed intake:

1. Feed not available to cows
2. Cows not able to feed
3. Poor or varying feed quality
4. Undesirable eating area
5. Feed not within reach
6. Sick cows
7. Injured cows
8. Lamé cows
9. Hot cows
10. Thirsty cows
11. Submissive cows
12. Feeding area difficult to get to
13. Cows associate pain with feeding
14. Not enough feeding space

For items 1 to 5, feeding area management has more influence than design. These items may seem obvious or trivial but are often overlooked. How many farms have you visited where the feed table was empty or feed not pushed within cow reach? Timely feed delivery, feed push-back, and feed area cleaning are high-priority tasks on dairy farms achieving high milk production levels. The amount of time cows spend away from feed (eg, milking center, exercise lot) should also be considered. Many producers, dairy scientists, and nutritionists suggest that cows should not be away from feed more than 3 hours per day. The more time cows spend away from the feeding area, the more critical adequate feeding space becomes, because the entire group may want to eat at the same time.

Healthy, mobile cows are more likely to visit the feeding area regularly. The environment surrounding the cows and herd health management influence items 6 to 9. Air quality, resting area comfort and cleanliness, and the floor surface all affect cow health and well-being. Ventilation system design and management should provide an

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