



Heifer Management Blueprints

Patrick C. Hoffman
UW-Madison
Department of Dairy Science

Unique Aspects of Managing Dairy Heifers in Free Stall Barns

Introduction

Dairy producers and heifer growers often manage dairy heifers in free stall barns as a labor efficient system to manage heifers. There are many unique aspects to consider when managing heifers with a free stall housing system.

The Benefits of Free Stall Housing

Free stall barns can be a very labor efficient way to house heifers. The use of free stall barns restricts the resting environment for heifers, allowing for easier observation, bedding and manure management. Primarily free stall housing systems allow for efficient manure management and reduction of bedding. In comparison to a bedded pack, free stall barns save on space needed per animal. The use of headlocks in free stall housing systems also allows catching heifers with relative ease to facilitate vaccinations, breeding and other routine management tasks associated with heifer management.

Negative Aspects of Free Stall Housing

One of the biggest draw backs of free stall housing systems is free stall resting surfaces do not work well for heifers <400 pounds in cold climates. This is due to a difference in heifer biology as compared to lactating cow biology. Young heifers weighing less than 400 pounds have more surface area (square inches of hide) per pound of body weight as compared to lactating cows. As a result, when small heifers rest on something cold such as cement, mattress or sand, net energy is lost due to conduction. Thus, the free stall resting surface may be too cold for a light weight dairy heifer to rest on and maintain energy balance for proper growth.

Heifers <400 pounds housed in free stall barns often look energy deficient during cold weather with abnormally rough hair coats and abdominal distention. Heifers under cold stress may also be more prone to respiratory disease.

Quirks of Managing Heifers in Free Stalls

Listed below are a number of management quirks associated with managing heifers in free stall barns that may require consideration.

- Heifers are difficult to move in free stall housing systems. Heifers are not adjusted to moving laterally down the alleys. Thus, management tasks such as weighing heifers on a scale may be challenging because heifers are not used to walking up and down the alleys to remote areas of the barn. Because heifers are not adjusted to moving laterally down the manure alleys, drover's alleys better facilitate moving heifers to remote locations (hoof trimming, scales, breeding chutes, etc.). The addition of drover's alleys will result in more management flexibility but increase the cost of the facility. Because of this issue, headlocks are most often used as a method of animal restraint in heifer free stall barns as compared to post and rail feeding systems.
- Managing heifer foot health can be a problem in free stall barns especially hairy heel warts. Because heifers do not move well laterally down the alleys, moving heifers to a common footbath or hoof-trimming stall can be challenging. Multiple or moveable footbaths in the cross alleys may be required to manage foot health issues.

- Free stall housing systems result in a paradox of how to remove manure off the alley surface. Because heifer free stall barns often contain multiple groups of heifers, skid-steer scraping systems require opening and closing of multiple gates. In contrast, mechanical alley scrapers are more prone to freezing in heifer free stall barns than cow free stall barns because of the type of manure produced and the number of animal units.
- Free stall floor surfaces are often slippery, which can result in some compromises in mounting behavior associated with heat detection, etc.

What Type of Bedding should be used?

The manure handling systems will most likely dictate the bedding used in a freestall barn. The main types of free stall beddings are mattresses and sand. Using sand as bedding has been demonstrated to provide more comfortable lying surface for the heifer but bedding usage and labor will be higher as compared to mattresses. Sand-laden manure may require sand settling lanes or mechanical sand separation systems. Mattress free stall systems are typically bedded with a layer of sawdust and result in a more flexible manure handling system but require bedding at more frequent intervals.

Bunk Space and Overcrowding

Overcrowding of a free stall facility may help optimize the economics of the facility, but may result in more heifers lying in alleyways, which are wet concrete surfaces not suitable for resting heifers. Trauma injuries can also result from heifers being housed in free stall barns too small for their body size. Notably swollen hocks and other trauma injuries have been reported from the use of small stalls. Large stalls allow for urine and feces to fall in the resting area of the animal. This can lead to more labor time spent cleaning stall surfaces, as well as a higher rate of mastitis in heifers. While research is limited, a general guideline is to not overcrowd heifer free stall housing systems more than 125 percent. Access to proper bunk space may be as much or more of a critical reason to avoid over-crowding than concerns with resting area. First limited bunk space may disallow any opportunity to limit feed heifers, which has been demonstrated to significantly improve feed efficiency and decrease manure production. Limit feeding strategies cannot be implemented when bunk space is inadequate. Second, severely limiting bunk space may result in shift feeding, feed sorting and ultimately uneven rates of average daily gains.

Managing Heifers in Free Stall Barns is Different

Every heifer housing system is a compromise between cost, labor efficiency and animal environment. Each of these should be taken into consideration when choosing a housing system. If you have a stable herd size and even calving distribution, free stall barns can be a very labor efficient and economically sound way to house animals >400 pounds. If the choice to use a free stall housing system for heifers is made, you must then choose what type of free stall operation you would like to operate. The manure management systems available will most likely dictate the bedding type, manure scraping systems and ultimately the barn configuration. Other critical management systems to consider are feeding, hoof health and animal restraint. You must also ensure your free stalls are of adequate size for the animal. They must allow adequate space for lying as well as lunge space and appropriate neck rail and brisket board height to minimize injuries. Recommended free stall dimensions for dairy heifers are listed in Table 1.

Table 1

Age (months)	6-9	9-12	12-15	15-19	19-24
Weight (pounds)	330-560	560-710	710-860	860-1050	1050-1290
Free stall Width (inches)	30	33	37	42	45
Side Lunge Free stall Length (inches)	60	64	72	78	81
Forward Lunge Free stall Length (inches)	72-78	76-82	84-90	90-96	93-99
Neck Rail Height (inches)	31	35	38	41	43
Curb to Neck Rail & Brisket Board (inches)	46	49	57	62	64

© Copyright University of Wisconsin

Revised June 2007