

# Sand Bedding in Tie Stall and Stanchion Barns

**G. Brickner, DVM**  
*Shireman Veterinary Clinic*  
150 S. Main St.  
Richland Center, WI 53581

**Chris Eisele, BS**  
*University of Wisconsin-Madison*  
School of Veterinary Medicine  
Madison, WI 53706

## Introduction

A well managed pasture can be an ideal environment to house cattle. When pasture is used there is excellent ventilation, adequate space for resting, a comfortable surface for a cow to lie on, and good traction for lunging forward when getting up and down. It is not surprising that cows are culled due to stepped on teats, swollen joints, and low production when comparing this environment to what is seen in stall barns. Also, uncomfortable cows do not consume as much dry matter which results in low production.

Sand as a bedding material has become very popular in large free stall operations because it is inexpensive, provides excellent cushion and traction for cows, and requires minimal labor. The idea of using sand in a tie stall barn was started by two herds near Green Bay, Wisconsin.<sup>1</sup> The idea is now spreading rapidly throughout Wisconsin.

## Materials and Methods

The purpose of this report is to describe how to install and maintain a sand bedding system, describe the problems that have been seen, and address some of the design modifications in tie stall and stanchion barns. The use of sand in stall barns has been approved in Wisconsin. However, there are some considerations to keep in mind. Wood can not be used in the back of stall platforms as bedding keepers, even if it is painted. The stall platforms must be left intact, and as required of all bedding, the sand must be kept clean and dry.

## Installation

The basic components to install a sand bedding system are to build a 4" bedding keeper at the back of the stall and to fill the stall area with 4 inches of sand. In addition, there must be at least an 8" curb at the

front of the stall to prevent sand from spilling into the feeding manger. The stall platforms are left intact as required to meet state milk inspection code. The major variation in stall design is the bedding keeper. The design that has worked well is to use a 3" Scd 40 PVC pipe mounted at the back of the stall platform. The pipe is mounted and secured at the back of the stall platform at every stall divider with 6" long 1/2" diameter bolts which have holes pre-drilled directly into the stall platform (Figure 1). Lead anchors are used to hold the bolts in the concrete. A 1/2" stack of washers is placed between the stall platform and the pipe to allow drainage of urine and water. A washer is placed under the head of the bolt also. The outside diameter of the PVC pipe is about 3 1/2" resulting in a final height of 4". All open ends of the PVC pipe will need to be capped to meet state milk inspection codes. Some dairy producers have needed to mount a 1x4 or 1x6 to the front of the stall using U-bolts to give the minimum 8" curb.

The cost for the initial installation of the sand bedding system including filling the stalls with sand has been from \$5 to \$10 per stall depending upon how much of the work is contracted out. The cost to maintain a stall will be around \$15 per year depending on the type of sand and its cost, and how extensively the barn is used during the summer.

## Maintenance

Stalls are maintained by topping them off with sand every 7 to 10 days. No maintenance is needed in between topping off other than scraping out the manure that falls into the sand. Sand that becomes wet with urine or water will dry out on its own. The average amount of sand needed to maintain a 50 cow stall barn is around 11-13 cu. yards per month. The type of sand that is recommended should have a clay content of less than 4% and be free of stones. Quarried sand is available in southwestern Wisconsin for \$5 per cu. yard delivered.





**Figure 1.**

**Problems in installation and use**

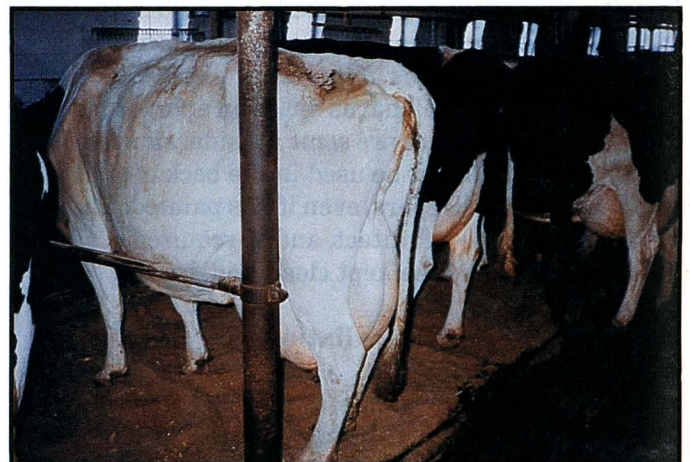
1. Stalls that are too long may have excessive accumulation of manure in the back of the stall. The stalls for Holstein cows should not be longer than 6 feet, and 5'6" is adequate for 1800 lb. Holsteins. Free stall dimensions from brisket board to back curb were used to determine placement of the bedding keeper. If stalls are too long, moving the bedding keepers forward on the stall platform will correct the problem. If there is a combination of shorter and longer stalls in the same barn, heifers should be kept in the shorter stalls.
2. Keep cow trainers well adjusted daily (4 finger widths above the withers). The voltage on the cow trainers may need to be increased because the cow's feet are drier and less able to conduct electricity.
3. Consider keeping a few stalls without sand and a bedding keeper for those cows that cannot be trained well enough or for cows that are leakers.
4. Manure in the gutters will tend to be wetter because there is less organic bedding present to soak up urine. As a result, cows' tails can become very wet when lying in the gutter. Some people have

installed gutter grates to deal with this problem. The most effective alternative is to dock the cow's tail if it has not already been done.

5. Other consequences of the sloppier manure will be in getting manure up a steep chute, which may require the dairy producer to add some feed or organic material to the gutter. Also, if a conventional end gate manure spreader is used there may be poor coverage when manure is spread. One farmer traded in his conventional manure spreader for a slinger-type spreader to get better manure coverage on the field.
6. It is expected that the sand may increase wear on manure handling equipment. In the 6 months to 1 year of experience that dairy producers have had with sand, major signs of wear have not been noted. The attitude of most dairy producers that have installed sand has been that they would rather wear out the equipment than the cows.

**Design Modifications**

1. Many barns have stall platforms that are raised above the alleyway. When the bedding keeper is installed, it also raises the stall platform an additional 4" and may present difficulties for cows when going in and out of the stalls. One solution at this point is a gutter grate which provides a platform for cows to step onto when going in and out of stalls.
2. In barns having stalls longer than 6' and wider than 4' it is not recommended that sand be used because of the difficulty in keeping the stalls clean. Maintaining at least a 4" deep layer of organic bedding material may be the best option.
3. There are a few stanchion barns that have installed a sand bedding system. Most stanchions will require a board in the front of the stall to increase the height of the front curb to the minimum of 8 inches. The board will prevent some movement of



**Figure 2.**

the stanchion, but if the board is placed on the stall side of the stanchion rather than on the manger side, the cow will still be able to lunge forward in the stanchion when getting up.

### Conclusions

The response of the cows to the sand bedding environment has been quite dramatic. Cows in tie stall and stanchion barns have been cleaner, lying down comfortably, and getting up much better (Figure 2). It has been the authors' experience that in most herds that install sand, somatic cell count decreases by half, and culling

for stepped-on teats and stall induced injuries decreases to near zero. Harder evidence from production and somatic cell count changes will be available when enough herds have used the system long enough. Although sand bedding may not be the answer to increase cow comfort for all barns, with some creative design it may work in more barns than might have initially been thought.

### Reference

1. Curtis, Carole. May 25, 1994. Sand bedding can work in tie barns, *Hoard's Dairyman*, Volume 139, No. 10;pp16-17.