# **Steps to Improving Existing Freestalls**

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"High producing cows rest 10 to 14 hours per day" – Albright & Arave

Providing a dry, comfortable resting area for dairy cattle is essential to their health, well-being, and performance. Cows typically rest 10 to 14 hours per day in five or more resting bouts. Well designed and managed freestalls can reduce excessive standing, allow more efficient rumination, improve cleanliness, and minimize injury.

Unfortunately, many freestall designs have favored reduced maintenance and lower cost over the cow requirements and comfort. Poor stall acceptance, unnecessary stress, injury and dirty conditions are often the result.

Most existing freestalls can be improved to better meet the needs of productive dairy cows. Some may only require minor adjustments, while others may need major structural modification. In either case, time spent studying cow needs, observing successful examples, and making necessary changes is well worth the effort.

#### **Improving Freestall Dimensions:**

(Refer to "Cow Freestall (Cubicle) Types & Details"- PSU ABE DIP 821)

Select dimensions that suit the <u>largest</u> cows in the group.

#### Length:

Stalls should be long enough to allow comfortable resting postures and adequate space for forward lunging. To comfortably lunge forward when rising, cows require approximately 30 - 44" ahead of their front knee location when resting.

- Stall Rows Along Outside Walls:
  - Remove lunging obstacles at wall.
  - Frame a sloping adjustable sidewall curtain support beyond the outside wall line that provides necessary additional length at stall level to allow forward lunging.





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- Head-to-Head and Inside Stall Rows:
  - Remove lunge barriers and modify stall support structure at stall front so there are no obstacles higher than 6" above the stall surface, and provide a minimum vertical clearance of 32".





### <u>Width</u>:

Stall dividers should be spaced to encourage the cows to enter, recline, rest, rise, and exit without striking them abruptly. Suggested stall width dimensions are typically given from the center of one divider to the center of the next. Keep in mind, the actual width is the suggested width minus the stall divider diameter.

- Typical freestall width for "large frame" dairy cattle is 48"- 52"
- Dry cows may require 2"-4" of additional width due to their "plus-size"

### Rear Curb Height:

Curb height can determine how willing cows are to use the freestalls. The main concern is the cow's ability to exit the stall. As cows step off the stall bed, they must support a significant amount of weight with one rear leg as she lowers the other to find the alley surface. This can be painful for moderately to severely lame cows.

• Maximum height from alley to stall surface - 12"; 8" preferred.

## Improving the Freestall Structure

Cows should be able to enter and exit the stall without striking the stall structure

The stall structure should encourage cows to use the resting area readily. The framework surround the stalls should accommodate the natural reclining, resting and rising motion of cows using them.

## Stall divider:

The purpose of the stall divider is to encourage cow position in the resting area to reduce injury and promote cleanliness. There seems to be an infinite number of types and configurations available. The best designs encourage cows to lie parallel to the stall length, and allow both forward and side lunging (when necessary).

Neck rail:

The primary purpose of the neck rail is to encourage cows to preserve lunge space – not to keep the stall bed clean. It should be located so cows can step comfortably onto the stall bed. Cows do not crawl into stalls, they lie down on them. Therefore, each cow needs to get all four feet onto the stall bed before they can start their rocking motion and recline.

Positioned properly, the neck rail will allow the largest cow in the group to stand on the stall surface with her back level, legs squarely placed beneath her, and her neck gently touching the neck rail.

- Typical neck rail location for "large frame" dairy cattle:
  - Vertical clearance from stall bed to bottom of neck rail 46"- 50"
  - Horizontal location from alley side of rear curb 68" 70"
- A number of methods using wood blocks, box steel, welded pipe fixtures, and clamps are used to raise existing neck rails to current recommended height without moving the stall divider.





## Brisket Locator:

The purpose of the brisket locator is to discourage forward movement when a cow is resting to preserve lunge space and minimize the chance of striking the stall structure when rising. It should allow the largest cow in the group to comfortably rest on the stall surface. It should also allow cows to extend their front leg(s) forward when resting, and step forward to rise.

- Typical brisket locator position for "large frame" dairy cattle
  - Brisket locator height: 4"-6" above stall surface
  - Horizontal dimension to cow side of brisket locator
    - Mattress or mat stall base from rear edge of mattress or mat: 68" 72"
    - Generously bedded stalls from cow side of rear curb: 68"-72"





### Improving the Stall Bed

Conform, Cushion, Traction, and Dry

The stall bed should conform to the cow's shape when resting, provide cushion to absorb shock when rising and reclining, have adequate traction to prevent slipping, and dry to encourage cleanliness and good udder health. There are several alternatives that provide a suitable resting surface – each has their own advantages and disadvantages. Select the alternative that provides best benefit for the cows and the disadvantages you can work with.

### Stall Bed Alternatives:

- Generously bedded: Typically a minimum of 4" of inorganic or organic bedding material. Generally seem to be the best accepted by dairy cows, but require very good stall maintenance and grooming to be successful.
- Fabric-covered mattresses: Popular alternatives contain crumb rubber, foam, or water filler material. These alternatives DO NOT replace bedding, but may reduce the total amount compared to generously bedded stalls.
- "Soft" resilient mats: A relatively new alternative that is available in sized either for single stalls, or the entire stall row. The best choices provide a suitable degree of comfort with adequate bedding. With use most "soft" mats will tend to expand in width and length. Therefore proper installation and trimming may be necessary at times.

### Bedding:

"No farm ever went broke buying bedding!" - Unknown

Bedding should be added regularly to help keep surface dry, provide additional comfort, and reduce abrasions.

- Inorganic bedding materials (i.e.-sand and ground limestone) tend to drain moisture away from the resting surface. They typically do not support the growth of pathogens that may cause udder infection. Inorganic bedding materials can be a concern in cold weather since they have little insulating value and can 'draw' heat away from the resting cow.
- Organic bedding materials (i.e.-sawdust, straw, shavings, etc.) absorb moisture to help dry the stall surface. Since it can support the growth of pathogens diligent handling, storage and management is necessary.

### **Improving Freestall Management**

<u>Observation</u>: Suggested freestall dimensions, stall structure details, and preferred stall bed alternatives are based on several years of experience, observation and evaluation of freestall success and failure. The best evaluators of freestall performance, however, are cows. Regular observation of stall

acceptance and use is necessary. Adjustments to the stall structure and/or stall management may be needed to realize the desired results.

- Periods of high stall use are typically observed early in the morning and two hours after returning from the milking area. Acceptance of 90% or more at these times is desired.
- Perching (standing half in/half out) usually indicates improper neck rail placement.
- Standing in stall with head above neck rail usually indicates improper neck rail placement.
- Diagonal resting often caused by improper neck rail and/or brisket locator placement.
- Hock injuries generally result from inadequate body space on stall bed, hard stall surface, and/or inadequate bedding.

<u>Stall grooming</u>: Manure and soiled spots should be removed from the stall bed – and dry bedding replaced – at least three times per day. Generously bedded stalls may need to be leveled two times per week.





Bedding frequency: Inorganic material is

typically added once per week. Organic material – especially on mattress and mats – should be added every 1 to 3 days. Bedding frequency can vary with the season. Add bedding based on cow needs rather than the calendar.

<u>Bedding management</u>: Bedding material should move from head to tail end of the stall. After removing soiled bedding from the rear of the stall, add fresh bedding to the area where the udder will touch when the cow lies down. Organic material absorbs moisture and can support pathogen growth during its time in the animal area. Resist the temptation to push bedding from the rear to the front of the stall to "get another day's use".

<u>Alley cleaning</u>: The cleaner the cow alley, the lower the amount of manure that will be tracked into the stall as cows enter. Keep in mind that the first step the cow takes in the stall is in the area that the udder and teats will come in contact with.

<u>Ventilation</u>: A good air exchange will remove moisture from the building and help keep the stall and floor surfaces drier. Adjust the ventilation system to control moisture, gas and pollutant levels throughout the animal area.

#### Summary

Many existing freestalls can be modified to contain the features of successful modern designs. The basic features freestalls should contain are:

- Cows should be able to enter and exit the stall without striking the stall structure.
- Select dimensions and component locations based on the largest cows in the group.
- Remove lunging barriers that interfere with natural rising and reclining motion of cows.
- Stall bed should conform to the shape of a resting cow, provide cushion and prevent slipping when rising and reclining.
- Bedding should be added regularly to help keep surface dry, provide additional comfort, and reduce abrasions.
- Remove manure & wet spots from stalls and cover cleaned areas with bedding at least 3 times per day.
- Suggested freestall guidelines at <u>www.abe.psu.edu/extension/ip/dippdfs/DIP821.pdf</u>





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Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

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1/2/2020 DFM