

## COW COMFORT

By Dave Balbian

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# Cow Comfort in Tie Stall Barns

Many factors impact cow comfort in tie stall barns, and modifications can be made to improve comfort, and ultimately productivity. When evaluating a tie stall barn for modifications, consider stall design, surface, bedding, feed manger, water system, ventilation and lighting.

**Stall Design:** Most tie stall barns were built years ago when cows were smaller. Genetics sneak up over time. Stalls historically were designed for the convenience of people, with less emphasis on cows. Many older tie stall barns with original stall dimensions are suited for Jersey cattle today. In some barns, with stall dividers broken out, cows are forced to stand because nearby cows lie down and occupy all the floor space. This limits lying time, which can have negative effects. How should stalls be sized?

The Ontario Ministry of Agriculture and Food has current herd guidelines online at: [http://www.omafra.gov.on.ca/english/livestock/dairy/facts/info\\_tsdimen.htm](http://www.omafra.gov.on.ca/english/livestock/dairy/facts/info_tsdimen.htm). Review all information before any changes are made. In some barns where support posts line up with stall dividers, structural modifications may be necessary if stalls are widened. If support posts need to be repositioned, hire a competent barn builder to make structural modifications. Also, cow trainers are often necessary to keep cows clean.

**Stall Surface:** Years ago the surface of choice was concrete with straw bedding. Many producers today use some type of mat or mattress over concrete. Numerous choices are available and they seem to grow in number and evolve every year. Avoid material that is hard and slick when wet, such as hard, used rubber belting. Many of today's options provide plenty of cushioning for the cow. Cost and durability enter the equation of what to use.

**Bedding:** In the past, some people thought that a high quality mat or mattress meant bedding could be eliminated. That has proved to not be true. Bedding enhances the comfort of the stall, absorbs moisture and keeps cows cleaner. Cows increase lying time, even in a tie stall, when more bedding is used. Hock abrasions and injury are also less with increased bedding. Today, bedding availability and cost influ-

ences what to use. Choices include straw, poor quality hay, chopped newspaper, sawdust, shavings and sand. Long material, like straw and hay, is chopped to reduce waste and facilitate manure handling.

Use of sand directly on concrete requires some stall redesign to facilitate adequate sand depth and maintain stall length. A mechanical way to bring sand into the barn is also needed. A skid steer is often used, but may not be possible in some barns. Producers who are considering sand bedding in a tie stall barn where a skid steer cannot be used often feel a wheel barrel can be used, but they will only do this once. Where it can work, sand can be an excellent choice for cow comfort. Manure handling has drawbacks, but producers who have converted to sand say the benefits outweigh the negatives. It's also inorganic, which reduces mastitis risk.

**Feed Manger:** Some feed mangers in old tie stall barns are well-worn. Over the decades, acid from feed eats the surface and leaves it very rough with protruding aggregate stones. It cannot be easily cleaned and harbors old, spoiled feed. How is this rectified? A variety of solutions are used, from plastic liners, tile, epoxy-type finishes and stainless steel. Anecdotal reports by producers who have re-lined feed mangers indicate that feed intake improves along with some increase in production.

Space is sometimes limited between the feed manger and the outside wall, especially after a remodeling project lengthens the stalls forward. Although it is not desirable to walk on the feed manger, it is sometimes necessary in remodeled barns. Some of these surfaces can be extremely slippery when wet, so exercise caution.

**Watering System:** Milk is over 85% water. So, it only makes sense that cows need easy access to all the water they desire when they want it. Some older

## FYI

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## THE MANAGER

tie stall barns that were added onto still use the main water line that was in place 40 years ago! Today the barn may have more cows that each produce more milk. Work with a local water equipment supplier and plumber to be sure the system has water lines properly sized with adequate pressure. Some new water buckets have high flow valves to accommodate high producing cows. Don't forget to maintain water buckets. I cringe when I see cows having to work hard to manipulate old worn out buckets just to get a little water to flow.

Some producers have put water trough systems in their tie stall barns and eliminated water bucket maintenance. The trough also acts as a reservoir so plenty of water is always available.

**Ventilation:** This is a big item. Many stall barns use tunnel ventilation. When properly sized and designed, fans can minimize production drops during hot weather. Formulas are available to make these calculations. Don't just hire the low bid when choosing a contractor to install tunnel ventilation. You may end up with too little in the bargain. Ask the contractor to show you their calculations for the total cfm fan capacity and the square footage of inlet opening needed. Many dairy Extension educators can do these calculations.

A few producers have converted to insulated sidewall curtains to improve ventilation. This is more common with new additions, and also when obstructions make tunnel ventilation unfeasible. Curtains can work well. When there is no breeze, circulating fans may be necessary to supplement natural ventilation.

**Lighting:** Many choices are available. Florescent fixtures are

Cow Comfort Economics 101 *continued from page 21*

Here are some of the most economically important relationships:

- Stalls per cow (1.7 lb/cow/day per 0.1 increase in stall availability), feed for refusals (+3.5 lb/cow/day), and feed push-ups (+8.7 lb/cow/day) all increase herd milk production.

- Commingling first-calf heifers with older cows leads to loss of resting activity, rumination and milk yield. Plan on a ~10% loss in milk for the heifers. When stocking rate is increased, the negative effect is even more pronounced, even at low levels of overcrowding, such as 110 to 115% of stalls and headlocks.

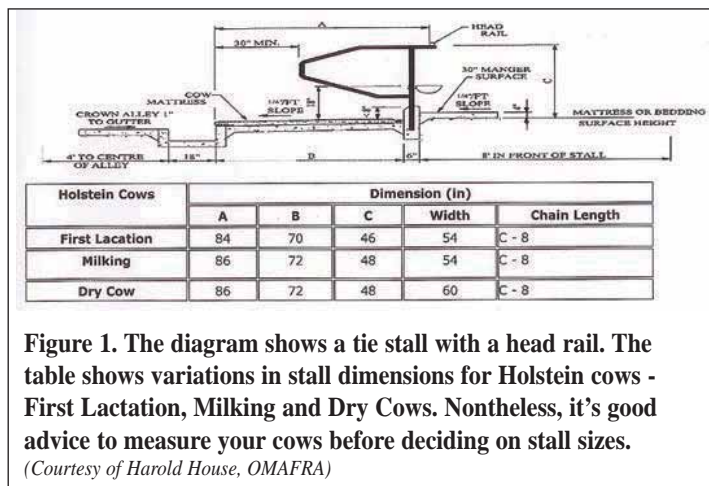
- Improving the comfort of a stall, according to numerous case studies, should improve milk yield (3 to 14 lb/cow/day), lower turnover rates (-6 to -13%), lower somatic cell count (-37,000 to -102,000), and reduce lameness (-15 to -20%).

- Optimizing the feeding environment will promote aggressive feeding behavior and greater dry matter intake which translates into more milk production. For Holsteins, 1 lb of dry matter intake translates into 2 lbs of milk.

- Lameness results in a loss of nearly 2,000 lb/cow/yr of milk annually, greater culling rate and reduced fertility.

- As bunk space decreases from 24 to 12 in/cow, percent of cows pregnant by 150 days in milk decreases from 70 to 35%. Also, conception rates are reduced with higher stocking densities. Given that pregnancy is valued at about \$300, this is an important, and often overlooked, effect of overstocking.

The list could go on, but it is clear that economic consequences



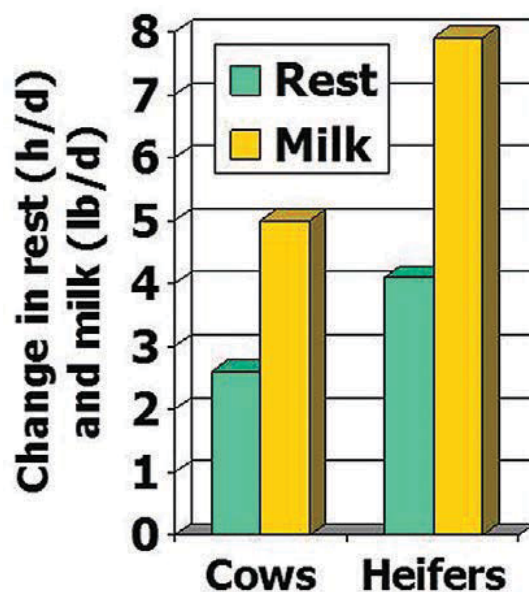
**Figure 1.** The diagram shows a tie stall with a head rail. The table shows variations in stall dimensions for Holstein cows - First Lactation, Milking and Dry Cows. Nonetheless, it's good advice to measure your cows before deciding on stall sizes.

(Courtesy of Harold House, OMAFRA)

most commonly used when new lighting is installed in tie stall barns. Select fixtures designed to tolerate moisture and dust. Lighting systems can also be designed to manipulate photoperiod to increase milk production. Work with a professional to design a system that provides adequate uninterrupted light to the cows, along with five to six hours of uninterrupted darkness. This requires the use of a timer to control the lighting.

Work with a competent electrician to install cow trainers, and new lighting and fans, to avoid problems with stray voltage. □

associated with improvement, or neglect, of cow comfort are very real. Research makes it clear that there is a predictable link between management, cow behavioral responses, and productivity and health. Now is the time to take advantage of what we know about improving cow comfort to improve the farm's bottom line. □



**Figure 1.** When time outside the pen is kept to 3, rather than 6 hours/day, cows respond with more time lying and higher milk production.