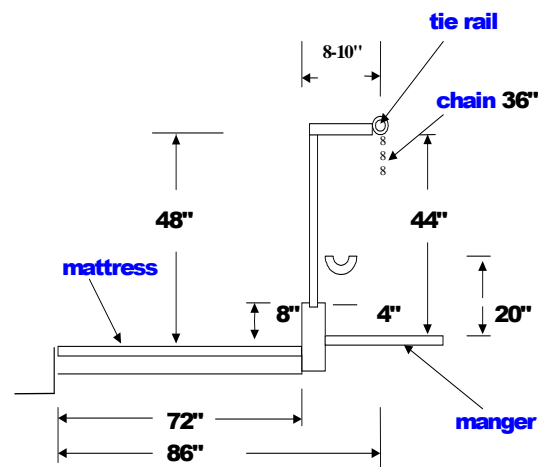


April 2, 2002

In the last two years, several Ontario producers modified their existing barns or built new tiestall barns with higher tierails, longer tie chains, wider stalls and longer platforms. Here are some notes and observations about the stalls.

- The measurements are guidelines for **Holsteins**.
- **About Tierail Location.**
  - **Height** - 48 inches from the top of the mattress to the bottom of the tierail.
  - **Forward location** - 86 inches forward of the gutter curb - or, 8-10 inches forward of the center of the manger curb.
  - **Alternatives.** Several producers have built these stalls with the tierail mounted 50 inches above the mattress and often locate it closer to the cow - not as far forward. Others have placed it at 44 or 46 inches and 10 inches forward.

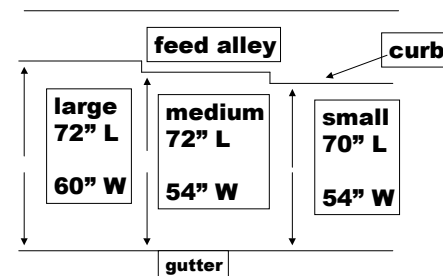
Tiestall Dimensions for Holstein-Friesians



- **An Observation.** Mature Holstein cows are about 96 inches long (average) from nose-to-tail. Most will stand with their heads in what appears to be a comfortable position with the tierail at the location described above. However, some longer cows will stand corner-to-corner to get the extra space that they need. The alternative is to locate the tierail further forward. However, some cows will step into the manger when reaching for feed when the tierail is located further forward of the manger curb.
- **Corner-to Corner Standing or lying.** With short platforms and the tierail too close to the manger curb, cows stand corner-to-corner in the stall to get the space they need.

- **Tierail placement for smaller cows and heifers.** Height - 46 inches. Forward location - 84 inches or less from the gutter curb, or 6 to 8 inches forward of the centre of the manger curb. Some producers have made the tierail adjustable fore and aft.
- **Platform length and width.** Length - 72 inches. Width - 54 inches. Some producers have built stalls 70 inches long and 51 inches wide for heifers and now wish that they had not built the stalls that small.

### tiestall - lengths & widths



• stall length altered at manger curb

- **Cow size and stall size.** The imprint length and width of the cow should determine the minimum platform length and width. One British study reported the imprint length of Friesian-Holsteins to be 71 inches. The narrow imprint width is about 48 inches. However, most stalls for mature Holsteins are being built 54 inches wide so they have room to stretch out in the wide resting position. A 72-inch stall does not allow cows to stretch their front legs forward in a normal long resting position. To do so, they lie corner-to-corner in the stall or extend their legs over the manger curb.
- **Adjustable tierail.** Some producers have made the tierail adjustable. Then they can vary the forward and vertical position of the tierail to suit their cows.
- **Chain length. 36 inches plus the snap and ring** - about 40 inches in total for a 48-inch tierail. The chain should extend to the top of the manger curb - not beyond that point.
- **Work in progress - go look at some.** There is no warranty or owner's manual with this stall design. This stall design is work in progress and with experience producers are finding what dimensions are best for their cows. Producers are reporting superior cow comfort and milk production in these stalls compared to their old traditional tiesatalls. Secondly, many producers have built a few stalls and placed the dumb heifers, etc in them to test the concept. Once convinced, they proceed to change the barn.
- **The divider or loop.** The loop for the divider must be short enough to allow the cow to back into the adjacent stall when turning to exit. Cows need about 30 inches - the distance from the gutter curb to the rearward point of the divider loop. Therefore, in a 72-inch stall, the loop would be 42 inches long. The height of the loop is also important because cows need to turn their heads and necks over it when leaving the stall. Often, stabling greater than 48 inches above their feet proves to be a challenge when they turn to exit the stall. Similarly, the steelwork at the end of a row is important - too high and cows cannot turn out over this partition - and there is refusal to use those stalls. Pick a suspended loop that drops down at the back and allows cows to turn their heads over it easier.
- **About stupid heifers and misfits, heat detection, grooming and cleanliness.** The open front stalls allow cows to get up and lie down with ease - rarely will you see a cow contact the tierail. There is little or no risk of entrapment as one finds in stalls with the low tierail. Indeed, owners report that heifers or cows that had difficulty rising in their old stalls (stanchion, comfort, or low tierail) get up without difficulty in the new stalls. They also report that a cow or heifer could go through into the feed alley, and some have, but that they live another day without being injured, crippled or destroyed. In the high tierail stalls, owners also say that cows get up and lie down more often than in stalls with low tierails and short chains. Some video observations revealed that the cows rest more hours per day in the new stalls. The long chains allow cows to express signs of heat and several producers claim improved reproductive performance with them. The long chains also allow the cows to rest with their heads back against their sides without choking as seen (and heard) in barns with short chains. Owners also report more grooming activity and cleaner cows.
- **Drawbacks.** The stalls have some drawbacks. When cows are in heat, the long chain gives them lots of freedom - but wrapping the chain around the tierail for 24 hours will restrain them from jumping over partitions. Cows walk forward while eating and

manure on the stall. However, they do the same in the old style tiestalls. In a recent comparison at one farm, the frequency of manure on the stalls was the same in the new and the old stalls. As always, stall cleanliness depends upon the manager as well as the stall design. Locate the trainers closer to the gutter in the new tiestalls.

- **About deep gutters.** Cows are reluctant to cross deep gutters - probably because of fear associated with a lack of depth perception and the deep black hole that they perceive before them. So, keep gutters reasonably shallow and put some straw in so they can see what confronts them and they will cross easily without jumping.
- **Stalls for dry cows.** Some producers have built stalls 72 inches long and 60 inches wide and they reserve those stalls for the largest cows or stalls for cows close to calving or soon after calving.
- **More milk with fewer stalls.** Most barns are built with stalls 72 x 54 and less commonly with 70 x 54 inches with the tierail 48 inches above the mattress. In some renovations, producers decide how many cows they want to milk and then squeeze the cows into the available space - which often proves not to be in the best interest of the cows. Producers who give cows the required space for normal behaviour report that the cows reward them with more milk, better health, and reproductive performance.
- **Water access.** The headspace above the water bowl should be 22-24 inches - the length of a cow's head. In the stalls with higher tierails, there is ample space for a cow's head while the bowl is placed well above the manger to allow for easy cleaning of the manger.
- **Manger height.** The bottom of the manger is 4 inches above the cow's feet - the top of the mattress.
- **Electric Trainers - further to the rear of the stall.** In tiestalls barns, feeding and chore time are also times when cows defecate the greatest number of times. Cows step forward and reach for feed at feeding time. They also manure on the stalls when standing forward. Producers with the new "freedom" tiestalls (high tierails, long chains, and open fronts) find the electric trainer must be positioned more rearward than it would have been in their old stanchion, comfort, or low tierail stalls. The location is about 47 inches from the gutter curb in the stalls with a 70-72 inch platform.
- **Diet and consistency of manure affect stall cleanliness and usefulness of electric trainers.** In some barns, producers have been frustrated with finding the best trainer location to achieve stall cleanliness - despite their best efforts, the trainers cannot produce the desired results. The posture and the arc in her spine of a defecating cow vary with feeds and feeding husbandry. Generally, a diet of dry hay and some corn silage leads to firm manure - and an arc in the spine during defecation. A diet high in haylage or grain produces more liquid manure - and less arc in the spine during defecation. As fecal consistency approaches diarrhea, there may be no arc in the spine and very slight elevation of the tail. For a within barn comparison, watch dry cows on a dry cow diet and milk cows fed for peak production. A nutritionist may suggest diet changes - reduce the haylage and increase the corn silage, feed some dry hay, or decrease the amount of grain. The solution to cow cleanliness concerns in some barns may be feeding for firmer manure and regaining the arced posture for defecation to

allow for proper function of the electric cow trainer. Remember to reposition the trainers about two inches above the cow.

Neil Anderson, OMAFRA, Fergus, Ontario 519-846-3410