



# RESEARCH REPORTS



## Moving the neck rail helps lame cows recover

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A recent Research Report showed how lame cows recover rapidly when provided access to pasture. Just 2 weeks on pasture led to improvements in gait of lame dairy cows. Cows that stayed in a free stall barn showed no improvement. Of course pasture access is not always possible, for example during the wet winter months here in British Columbia. Our next question was whether indoor housing could be modified to allow similar benefits? Specifically, can changes to freestall barns provide similar benefits for lame cows?

Standing outside of the stall (typically on wet concrete) increases the risk of lameness. One aspect of the stall that especially affects where cows stand is the position of the neck rail.

If stalls could be custom fitted for each cow, the neck rail would be positioned so that each cow could lie down and stand up comfortably in the stall, but while standing she would be 'indexed' so that her urine and feces fall in the alley outside of the stall. Unfortunately, cows come in a wide range of sizes, and this 'fit' is hard to get just right.

Both the height of the neck rail and its distance from the curb affect standing behavior; more restrictive neck-rail placements (lower and closer to the rear of the stall) prevent cows from standing fully in the stall. Preventing the cow from standing in the stall is one way to keep stalls clean, but has the unfortunate effect of forcing the cows back onto the wet concrete outside of the stall.

In a recent study, we showed how neck rail placement affects the cows' ability to stand in the stall. We tested cows with neck rails positioned over the range of values found on commercial farms; ranging from a restrictive placement of 130 cm from the rear curb, to a much more generous 190 cm from the curb.

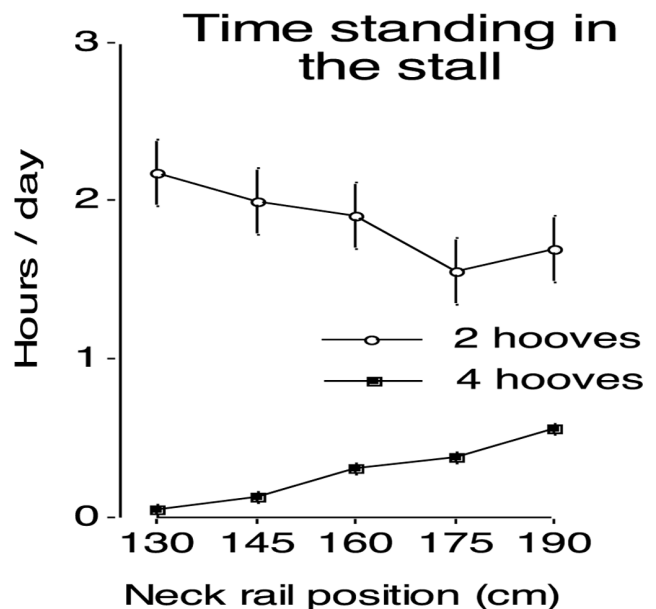


Figure 1. Moving the neck rail away from the curb allowed cows to spend more time standing in the stall and reduced the time they spent perching standing with the front 2 hooves in the stall. This study included 5 pens with 6 cows per pen and each pen was tested with each of the 5 neck rail positions.

As can be seen in Figure 1, cows showed a clear dose response to neck rail position. The more restrictive the neck rail, the more time the

cow spent perching (standing with the front hooves in the stall) and the less time she was able to stand fully in the stall.

This clear result gave us an idea. We knew that standing outside of the stall increases the risk of lameness, and now we also saw how a simple aspect of stall design can change where the cows stand. Could we create an environment that would help lame cows recover simply by moving the neck rail?

Lameness takes weeks to develop and weeks more for cows to recover, so in our next experiment we tested cows for 10 weeks. This time we tested just the two extreme positions from the previous study, 130 and 190 cm from the rear curb. Cows were housed in pens with the neck rail in one position or the other for the first 5 weeks. Treatments were then switched ('crossed over') and the cows were observed for another 5 weeks. Every week cows were gait scored using the UBC scoring system; cows with perfect gait are scored 1, and severely lame cows are scored 5. Scores of 3 or greater are considered clinically lame.

Again, the results were clear. When provided stalls with the more generous neck rail placement (190 cm from the rear curb), the cows spent more time standing with all 4 hooves in the stall and less time 'perching' with just the front two hooves in the stall. As expected, this change in behavior resulted in a change in lameness. Figure 2 shows how gait changed over the 5 weeks tested with each position. When cows were housed with the neck rails positioned permissively at 190 cm gait improved, and gait worsened when kept in pens with the neck rail at 130 cm.

We recorded 13 new cases of lameness over the experiment, but only two of these occurred while cows were in pens with the neck rail at 190 cm. Also as expected, stalls in these pens were more likely to become contaminated with feces and urine; however, we saw no increase in the number of clinical or sub-clinical intra-mammary infections.

This study provides the first experimental evidence that changes in stall design can reduce the risk of lameness. The results also illustrate

how changes in design that result in improvements in cow comfort and lameness can come at the expense of cow and stall cleanliness.

## Gait score

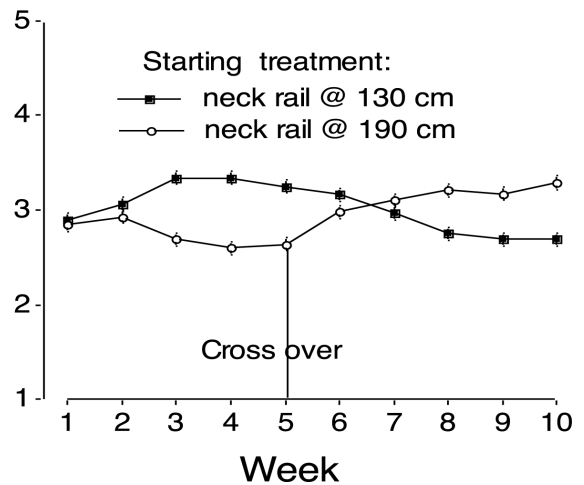


Figure 2. Changes in gait score when cows were housed in pens with neck rails positioned at 130 cm from the rear curb or 190 cm from the curb. Cows were assigned to one treatment for the first 5 weeks, and then tested on the alternative treatment for the next 5 weeks. Gait improved (i.e., gait scores declined) when cows were housed in stalls with the neck rail at 190 cm, but worsened when treatments were switched and the neck rail was made more restrictive. Cows started on the 130-cm treatment showed the opposite pattern (i.e., increased gait scores followed by declines after the cross over in treatments).

From our perspective the benefits exceed the costs associated stall maintenance. However, a better option would be housing that keeps cows clean and reduces the risk of lameness. Well-managed pasture can do just this, but most dairy producers also require indoor housing. Our aim now is to develop housing systems that provide both a suitable environment for the cow to stand (thus reducing the risk of lameness), and a clean, dry lying surface that promotes cow comfort and udder health (thus reducing the risk of mastitis).

This report is based on recent UBC studies. We thank our colleagues who made this work possible – Florian Bernardi, Jose Fregonesi, Cassandra Tucker, Doug Viera and Christoph Winkler. We also acknowledge the organizations that helped fund these studies, especially the Natural Science and Engineering Research Council and the Dairy Farmers of Canada. We are also grateful to our many other industry partners (including Westgen Endowment Fund, BC Dairy Foundation, BC Milk Producers Association and others listed at [www.ubc.ca/animalwelfare](http://www.ubc.ca/animalwelfare)) whose funding allows our research to continue.