



RESEARCH REPORTS



Assessing cow comfort on dairy farms

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One of the most important criteria for designing dairy barns is a comfortable place for cows to lie down. Producers spend millions of dollars renovating or building new facilities with cow comfort in mind, but what changes work and how can we evaluate them?

Previous UBC research has shown that if stalls are uncomfortable cows use them less, and instead they spend more time standing outside the stalls. Time standing on wet concrete increases the risk of lameness. These research studies measured lying times by video recording cows 24 h/d – an approach not practical on most commercial farms. So how can producers evaluate cow comfort on their farms?

An approach commonly used to assess cow comfort is simply walking through a barn and counting how many cows are lying down in the stalls, how many cows are standing up either fully inside the stall or with only two front feet in the stall, how many cows are feeding, and how many cows in total are in the pen. These counts can be used to calculate indexes such as the Cow Comfort Index (CCI) or the Stall Use Index (SUI). CCI is calculated as the number of cows lying down divided by the total number of cows in a stall, either standing or lying. If all cows are standing the CCI is 0% and if all cows are lying down the CCI is 100%. SUI is calculated as the number of cows lying down divided by the total number of cows in the pen that are not feeding. In other words, if every cow in the pen is either lying down in a stall or feeding, the SUI would be 100%. The question is: Can these snapshots give producers a useful estimate of cow comfort on their farms?

To help answer this question, UBC researchers teamed up with industry partners (Investment Agriculture Foundation, Westgen, Clearbrook

Grain and Milling / Nutritech, Richie Smith Feeds, Unifeed, and Artex) and 43 BC milk producers to develop better measures of cow comfort.

Researchers placed inexpensive electronic data loggers on the back leg of 50 high producing cows on each participating farm. The loggers, slightly bigger than a double AA battery, were programmed to record if the cow is standing or lying down, and recorded this data every minute for 5 days.

We were able to evaluate the CCI and SUI by comparing the data collected from a walk-through of the barn with the lying data collected from the data loggers. Despite the popularity of these indices for on-farm assessments of cow comfort, our data show that there is simply no relationship between the actual amount of time cows lie down and either CCI or SUI. For example, farms that

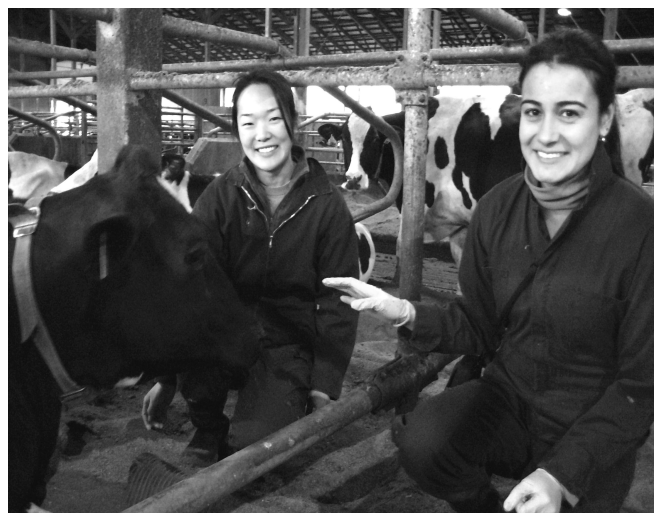


Figure 1. Kiyomi Ito, a Master's student in the Animal Welfare Program, and Alejandra Barrientos, a visiting veterinarian from Chile, visited 43 dairy farms in the Fraser Valley.

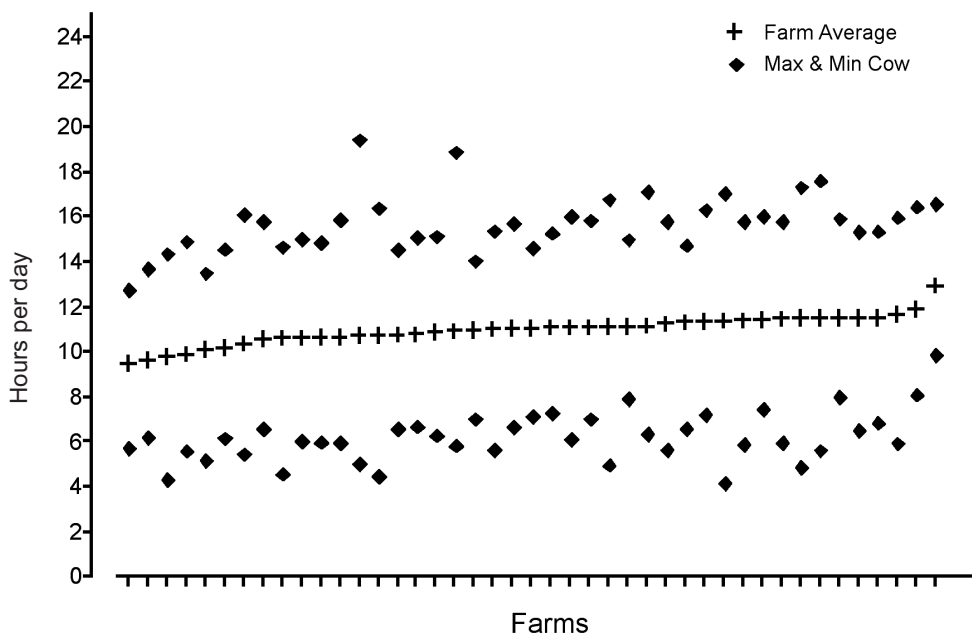


Figure 2. On average, cows on the 43 farms in the Fraser Valley spent 11 hours a day lying down. Also interesting was the variation within each farm with some cows lying down for less than 5 hours a day while others lay down for more than 18 hours a day.

had an average lying time of 11 h/d had CCI values ranging from 50 to 90%.

The number of cows lying down in any given pen at any given time depends on many things, including when they were fed, when they were milked, and what time of the day it is. Taking only a single look at a group of cows to decide how much they are lying down is just too simplistic to be of value.

The good news is that the data loggers provide producers with a very powerful assessment tool that can be used to trouble shoot cow comfort issues on their farms. Although we used 50 loggers for 5 days on each farm, our analysis shows that reliable estimates of farm averages can be generated by following 30 cows per farm for just 2 or 3 days.

Each of the producers participating in the current study received an individual report showing the data for their farm and how it compared with the other farms. The average amount of time cows spent lying down on the 43 farms ranged from 9.5 hours per day to 12.9 hours per day. As Figure 2 shows, most farms had average lying times around 11.0 hours per day.

We suggest that measuring lying behaviour using these loggers can be useful in evaluating the benefits of changes in barn design or

management. For example, cows' behaviour can be compared after a period of overstocking or after a change in the stall bedding.

One surprising result was the wide range in the amount of time individual cows spent lying down within each farm. In fact, differences between individual cows on the same farm were larger than differences between farm averages. These results suggest that we need to pay more attention to individual cows, instead of just the 'average' cow, to be sure that the stalls work well for all cows in the herd. Other research has shown that changes in barn design and management can be especially beneficial for some cows. For example, lame cows can have problems competing for access to stalls, and may especially benefit from increased stall availability.

This study was the first to describe in detail the variations in lying behaviour of individual cows on commercial farms. Looking at the huge differences between individual animals within farms led us to ask our next question: Is lying behaviour related to lameness? We are currently working with lameness measures collected on the same 50 cows from each farm to see how lying behaviour can predict lameness. Our ultimate aim is to identify factors related to farm design and management that improve cow comfort and reduce lameness in dairy cows.