

COW COMFORT

By Lindsay Collings

The Northeast ranks highest in the country for lameness and hock injuries.

Novus C.O.W.S. Program: Overview and Results

The Novus C.O.W.S. Program is a science-based, comprehensive, on-farm cow comfort assessment. The program originated from the University of British Columbia (UBC) Animal Welfare Program. In 2010, Novus created the C.O.W.S. Program and partnered with UBC to start on-farm assessments in the United States. In 2011, Novus officially started offering the C.O.W.S. Program as a value-added service to customers.

The first stage in the assessment is the on-farm portion, where animal-based measures, such as lying time, lameness and leg injuries, and management and facility measures, such as stall stocking density, feed bunk space, stall dimensions and bedding dry matter are collected. Initially, the assessments were completed on the high producing, mature cow pen in freestalls and dry lots. However, the program continues to grow and adapt to customers' and producers' needs. Assessments are now complete on other groups of cows, including first lactation or fresh cows, and in other facilities, including tie stall and robotic milking herds.

The second stage of the assessment is to provide

feedback to the dairies. Producers receive a formal report that outlines their individual results, and places them on the regional benchmark. The goal of the assessment and report is to promote discussion, provide producers with valuable information about cow comfort on their farm, and outline benchmarks to highlight potential areas for improvement.

The Novus C.O.W.S. Program has assessed over 300 dairies across the United States. Additionally, Novus currently has benchmarks for three regions in the US: freestalls in California, freestalls in the Northeast, and open lots in Texas/New Mexico. A Midwest benchmark is almost completed.

Previous research has outlined the significant impact facility design and management factors can have on cow comfort. Three important measures of cow comfort assessed by the C.O.W.S. Program include lying time, lameness and leg injuries. Lying times in each region across the US were quite similar, averaging around 10.5 h/d, and ranging from 7.5 h/d to 12 h/d (**Figure 1**). Lameness prevalence was highest in the Northeast at 55%, with California and Texas/New Mexico averaging just above 30% (**Figure 2**). The prevalence of hock injuries was also highest in the Northeast (81%), compared to California (56%) and Texas/New Mexico (18%) (**Figure 3**).

Within each region across the United States, measures of cow comfort have a large range. Although lameness and hock injuries are more prevalent in the Northeast, each region has farms that perform above and below the benchmark. This indicates that good

Figure 1. Lying times

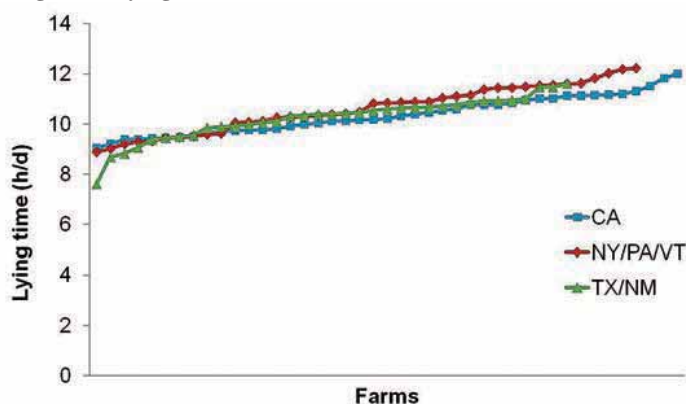


Figure 1. Average daily lying time (h/d) of the high producing, mature cow pen on herds in the three US benchmarks: free stalls in the Northeast (n=40), free stalls in California (n=43) and open lots in Texas/New Mexico (n=35) (von Keyserlingk et al., 2012).

FYI

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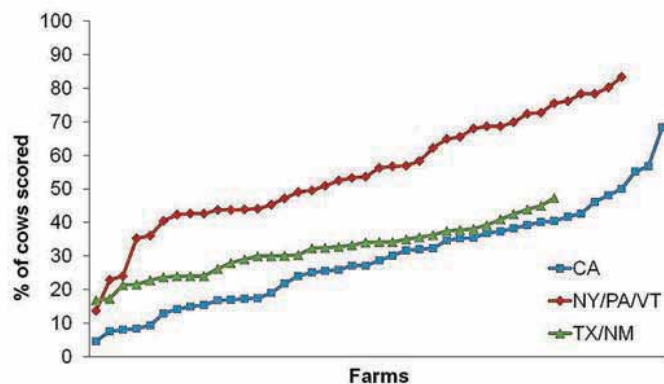
THE MANAGER**Figure 2. Lameness and leg injuries**

Figure 2. Prevalence of lameness in the high producing, mature cow pen on herds in the three US benchmarks: free stalls in the Northeast (n=40), free stalls in California (n=43) and open lots in Texas/New Mexico (n=35) (von Keyserlingk et al., 2012).

cow comfort is achievable in each region, regardless of negative trends.

Cow comfort issues and bottlenecks are multifactorial and herd specific. Look at the dairy system as a whole and include the whole management team, including the producer, herds person, consul-

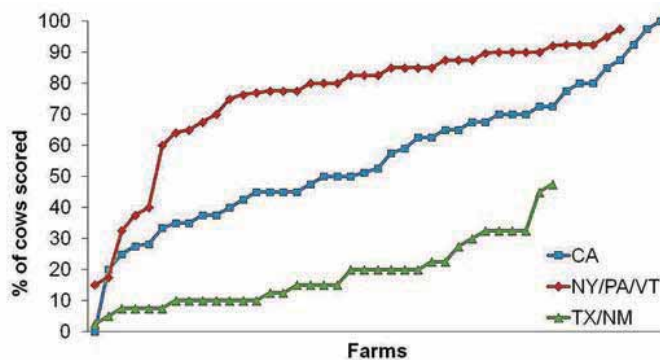
Figure 3. Hock injuries

Figure 3. Prevalence of hock injuries in the high producing, mature cow pen on herds in the three US benchmarks: free stalls in the Northeast (n=40), free stalls in California (n=43) and open lots in Texas/New Mexico (n=35) (von Keyserlingk et al., 2012).

tant, vet and hoof trimmer, in cow comfort discussions. The Novus C.O.W.S. program indicates even small changes, such as moving the neck rail or improving parlor efficiency, can have a significant impact to improve cow comfort and production, which eventually affects the dairyman's bottom line. □

Increase air exchange in naturally ventilated barns c
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ventilation can provide predictable, rapid air exchange. However, circulation fans may be needed to improve air movement at resting and feeding areas. Tunnel systems are designed for hot weather and not intended for cooler seasons. As fan capacity is decreased, air quality between the inlet and exhaust ends of the building can vary significantly.

Cross Ventilation: Cross ventilation can provide rapid air exchange and air movement at cow level during summer. Fans are placed along one sidewall and draw air across the building width. Air speed should be at least 300 fpm to provide adequate air movement at cow level. The number of fans needed may exceed the number needed for tunnel ventilation. An advantage touted for cross ventilation is that air moves across the barn parallel to the backbone of resting cows, which may move air across a larger area of a cow's body compared to tunnel ventilation. Keeping fresh air movement at cow level can be a challenge, so strategically placed baffles may be necessary. This is a hot weather system. Placing fans in 'banks,' rather than continuously along the sidewall, allows adjustable curtains to be installed between the banks, and can be used in cooler seasons when the fans are not operating.

Exhaust Fans at Peak: Install exhaust fans at the peak to remove stale air and provide predictable air exchange. This system removes excess heat and controls moisture and pollutants. It will not provide the amount of air movement that tunnel or cross ventilation systems do, so circulation fans are necessary at feeding and resting

areas. Fans are spaced no further than 40 feet apart along the ridge. Any opening between fans is covered to prevent short circuiting. As with any exhaust ventilation system, the challenge is to provide adequate inlets for good, fresh air distribution. If the sidewalls are mostly open, very little pressure difference between the inside and outside of the barn is developed. Fans still remove stale air, but air movement is not as apparent as with tunnel or cross ventilation. If sidewalls are more closed, provide two square feet of inlet area per 1,000 cfm of fan capacity at cow level, uniformly along sidewalls. This method develops a static pressure difference and may provide more uniform distribution of fresh air. An advantage of this system is that it can provide an air exchange at lower rates during cooler seasons by using variable speed fans, timers or staggering fan on/off.

Pressure ventilation systems: Pressure ventilation systems use fans to force fresh air into the barn through flexible tubes or rigid ducts. Two or more rows of outlet holes, properly sized and spaced, along the tube/duct length distribute air evenly to cows. One square foot of duct cross section is required per 1,000 cfm of fan capacity. Providing one air exchange per minute for summer weather usually requires large holes and duct sizes, but air can be directed toward cow level and may reduce circulation fans. Pressure ducts distribute air approximately 12 feet on each duct side. Duct length is limited, so multiple ducts are necessary in most layouts, especially if the pressure ventilation system is used for more than summer ventilation. Since fresh air is forced in the barn, stale air must find a way out, so adequate sidewall openings and/or similar capacity exhaust fans are necessary. □