

Lameness in Robotic Dairies

Robotic milking is becoming popular on dairy farms. The University of Minnesota Extension team reported that the top three reasons for installing a milking robot were improved lifestyle, reduced hired labor and the ability to grow without additional hired labor. Along with feeding the cows, cleaning the facilities and taking care of cow's health and reproduction, fetching cows is one of the main tasks on robotic dairies. It has been reported, on average, 8% of the cows must be fetched to the robots, and dairy workers spend 51 minutes per day per robot fetching cows.

In robot milking systems, lame cows need extra care

Canadian researchers observed lame cows were 2.2 times more likely to be fetched than non-lame cows. Using a locomotion score on a 5-point numerical rating system (1 = sound to 5 = extremely lame), the researchers (King et al., 2017) compared 353 lame (score ≥ 3) with 865 non-lame cows (score < 3) from 41 Canadian farms. As expected, lame cows produced 3.5 lb. per day less milk, and had 0.3 fewer milkings per day.

In a previous work conducted at the same dairies, these authors (King et al., 2016) assessed the effect of herd-level factors on the prevalence of lameness. The researchers collected milking data for all cows on each farm, and individually scored 30 cows per farm using the 5-point locomotion score. Across farms, the mean herd-level prevalence of clinical and severe lameness were 26% and 2.2%,

respectively. These were the main factors associated with lameness prevalence:

- **Frequency on scraping manure:** every two extra passes per day were associated with a 1.2-percentage-point decrease in clinical lameness.
- **Stocking density:** A 10-point increase in stocking density above the mean (88.6%) was associated with a 0.5-point increase in severe lameness.
- **Stalls:** A 2" increase in curb height above the average (8") was associated with a 1.0-percentage-point increase in severe lameness.

Similarly, Westin et al. (2016) surveyed 36 robotic dairy farms (range 42 to 495 cows) in Canada (29), and Michigan (7). To identify lame cows, all cows were individually video recorded while walking in the feeding alley after they were released from the head locks. In this study, the mean herd prevalence of lameness was 15%, but ranged from 2.5% to 46%. These were the main findings:

- Not fitting the stall width was the strongest risk factor for lameness, increasing the odds of lameness 3.7 and 4.5 times in first lactation cows and those in second lactation and higher, respectively.
- A narrow feed alley ($< 14.3'$) was associated with higher odds of lameness (1.9 times).
- Obstructed lunge space increased the odds for lameness (1.7 times).
- Sand bedding in stalls was associated with lower odds of lameness (0.63 times).

These results suggest for lameness prevention in robotic dairies, more emphasis needs be placed in building stalls of appropriate dimensions. **M**



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