

Impact of Neck Chain Length on the Behavior of Dairy Cows in Tie-Stalls

J. Higginson, HBSc; S. T. Millman, PhD; G. Ogilvie, RVT, BSc; D. F. Kelton, DVM, PhD
Department of Population Medicine, University of Guelph, Guelph, Ontario, Canada

Introduction

The majority of dairy cows in Ontario are housed in tie-stall barns, with tremendous variability in stall characteristics and dimensions among farms. An observational study conducted by our research group on 317 farms in 2003 identified several key stall characteristics as being associated with lameness, injury and cow cleanliness. Specifically, increased length of tie chain was associated with increased cow cleanliness and a decrease in hock lesions. To further investigate the importance of neck chain length, a pilot study was conducted to examine the behaviour of dairy cows in stalls with two different chain lengths and to determine if cows would exhibit a behavioral preference for increased chain length.

Materials and Methods

Eight lactating Holstein cows were exposed to two different chain lengths, 23 inches (the standard chain length at the University of Guelph Elora Dairy Research Farm) and 33 inches (the 90th percentile for Ontario based on the 2003 study) over a two-week conditioning period. Chains were changed once daily and the animals were randomly allocated to a long or standard length chain for seven days each. Stalls were also modified to give visual cues to associate color attributes of the stall with the length of chain. Four cows were conditioned to associate the longer chain with red, while the other four had yellow paired with the longer chain. During this conditioning period, behavioral observations were collected using timelapse digital videorecording, and behavior was scored with instantaneous 10-minute scan sampling during the daylight hours when cows were exposed to the standard chain and the first day when they were exposed to the long chain. Behaviors of interest included lying positions (long, short, narrow, wide, lateral), standing positions (in stall, perching), feeding, drinking, head-butting, grooming (allo- and self-), scratching, biting/licking stall, nose pressing, cow's head in another stall, idling and aggressive behavior. Following the conditioning period, preference tests were

conducted for 5 consecutive days. Twice a day, after milking, cows were released from the parlor and allowed to choose a stall (and hence, chain length) based on the color cues. The cows remained in the chosen stalls until the next milking.

Results

A total of 1,456 scans were evaluated for cow behavior. There was a significant difference in the lying position of cows with standard chains, versus cows with long chains. Cows with standard chains were more likely to adopt a wide lying position than cows with long chains. There were no other statistically significant differences in the behaviors evaluated. Of 72 opportunities to select stalls (9 replicates for each of 8 cows) the standard chain length was chosen 47 times, and the longer chain was selected only 25 times. The preference for the standard length was statistically significant at $p < 0.10$ for two cows, one that selected the standard length on all 9 occasions and a second cow that selected the standard chain 8 times. Hence, 6 of 8 cows selected the standard chain length more often than the long chain.

Significance

Given the small scale of this pilot study the results need to be interpreted with caution. Nonetheless, it is interesting that several cows demonstrated a preference for the standard chain length over the longer chain, and that none of the cows preferred the longer chain. It is also interesting that cows tethered with the standard chain were more likely to assume the wide lying position, believed to be the most comfortable position, than cows with longer chains. The a priori expectation was that cows would prefer the longer chain length, yet this was not the case. It may be that the cows were accustomed to the standard chain and demonstrated a preference for the 'usual'. Alternatively, the relationship between chain length and cow comfort may not be linear, if, for example, cows utilize the neck chain to assist posture transitions.