Effect of dairy cow personality traits on feeding and milking behaviour of cows milked in automated systems

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Automated milking systems (AMS) allow dairy cows to be managed at a more individual level, through customized feed supplementation and milking permissions. However, differences in personality traits between cows can influence their feeding and milking behaviours. Three studies were conducted which aimed to investigate the relationship between cow personality traits and feeding and milking behaviors under: 1) different amounts of AMS concentrate (15 cows; 3.0 vs. 6.0 kg/d), 2) transitioning mid-lactation cows to an AMS with different AMS concentrate amounts (29 cows; 2.0 vs. 6.0 kg/d), and 3) transitioning fresh cows to an AMS (60 cows). Personality traits were assessed in each study through observation of behaviours in response to a novel environment, object, and human. In study 2 and 3, personality traits were consistent across the transition to an AMS. In study 1, more fearful cows were less likely to consume the maximum amount of AMS concentrate ($P<0.01$) and had greater daily variation in AMS concentrate delivery when allocated 6.0 kg/d ($P=0.05$). When transitioned to an AMS in mid-lactation in study 2, bolder cows who were provided more AMS concentrate were at lesser risk of problematic milkings ($P<0.01$) and had less daily variation in AMS concentrate delivery ($P=0.01$). Bolder cows who were provided more AMS concentrate were at lesser risk of sorting for long ($P<0.01$) feed particles, but at a greater risk of sorting for short ($P<0.01$) particles. More active cows who were provided with more AMS concentrate were at greater risk of problematic milkings during the first 3 days on the AMS ($P=0.05$). When transitioned to an AMS in the fresh period in study 3, more active cows had more voluntary AMS visits ($P=0.04$) and more successful milkings per day ($P=0.03$), while bolder multiparous cows produced more milk ($P<0.01$).
Take home message: The data from these studies indicate that dairy cow personality traits are consistent over several different management challenges, and influence feeding and milking behaviours, as well as performance when milked on an AMS.

Associations of herd-level housing and management practices during the dry period with early-lactation udder health in herds with automated milking systems

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The aim of this retrospective study was to identify herd-level housing and management practices during the dry period that are associated with udder health in early-lactation cows on automated milking system (AMS) farms. Data were collected from 166 commercial AMS farms (mean=116±111 milking cows) across Canada from 10/2018 – 09/2020. Producers were surveyed regarding housing and management practices. On each farm, we selected all cows (n=14,007) that had available DHI SCC information for their last milk test prior to dry-off (>250 DIM) and their first milk test after calving (5-45 DIM). Using SCC data, we calculated the somatic cell score (SCS) for the first milk test after calving (PostSCS) for each cow and the herd-average PostSCS (mean=2.43±0.60). Subclinical intramammary infection (IMI) was estimated using cow SCC data. Cows "not infected" (SCC<200,000 cells/mL) in their last test prior to dry-off but "infected" (SCC≥200,000 cells/mL) on their first test after calving, were categorized as cows with "new IMI". We then calculated the incidence risk of new IMI across the dry period for each herd (mean=16.5±9.3%). Higher herd-average PostSCS was associated with not using teat sealants at dry-off (P=0.01), not using blanket antibiotic dry cow therapy at dry-off (P<0.001), and not leaving cows in the same group during the entire dry period (P=0.01), and tended to be associated with not separating cows into a different pen as preparation for dry-off (P=0.06) and placing cows onto the AMS within the first day after calving (P=0.09). A lower incidence of new IMI was associated with housing dry cows in pack pens and stalls (P=0.02) as compared to only pack pens and with a higher herd-average 305-d milk yield (P=0.02), whereas a higher incidence of new IMI tended to be associated with not separating cows into a different pen as preparation for dry-off (P=0.08).
Take home message: Producers may be able to implement housing and management practices that improve udder health in early-lactation cows in AMS.