

**Walking impulses of sound and lame dairy cows**

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Automated lameness detection is objective and fast contrary to visual scoring. Here semi-automatically obtained walking impulses of lame and sound cows before and after claw trimming are compared. Four primiparous and 5 multiparous cows walked individually across 2 parallel 3D force plates repeatedly on 2 consecutive days before trimming (time=before); 2 consecutive days after (time=early); and 1 week after trimming (time=late). Cows were visually lameness scored on a scale from 1 (sound) to 5 (severely lame). Before trimming 4 cows were moderately lame (score=3), and 5 walked normally (score<2), 1 week after trimming all walked normally. Daily means per cow per leg (n=180) were calculated. Symmetry between sides for front and hind ends was calculated, where 100% is full symmetry. Parameters were mixed model analysed with score, end, time, and walking speed as fixed and cow as random effect. Lame cows walked slower than sound cows (t-test: 1.25 (0.19) vs. 1.37 (0.15) m/s; P<0.01). Front end vertical impulse ( $I_v$ ) was 3.19 (0.09) N×s/kg, hind was 2.94 (0.11) N×s/kg, speed lowered  $I_v$  (-1.11 (0.17) N×s/kg; P<0.001). Front  $I_v$  symmetry was 88.5 (2.4)%, hind 85.3 (2.4)%. Front horizontal braking impulse ( $I_b$ ) was -0.25 (0.01) N×s/kg, hind -0.12 (0.01) N×s/kg, speed diminished  $I_b$  (0.06 (0.02) N×s/kg; P<0.01). Front  $I_b$  symmetry was 78.2 (4.4)%, hind was lower (63.4 (4.4)%; P<0.001). Front horizontal accelerating impulse ( $I_a$ ) was 0.11 (0.01) N×s/kg, hind 0.24 (0.01) N×s/kg. Front  $I_a$  symmetry was 65.0 (4.5)%, hind was higher (73.6 (4.5)%; P<0.05). Briefly, sound cows did not produce 100% symmetric impulses. Walking speed lowered impulses, except  $I_a$ . Trimming and lameness did not affect impulses, but symmetry differed between ends. Including speed in the model probably removed some effect of lameness.

**Claw health diagnoses in the routine health monitoring system of Austrian Fleckvieh cattle**

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In Austrian cattle, veterinary treated claw diseases are recorded within the nation-wide health monitoring system. However, a routine genetic evaluation of health traits is currently only available for mastitis, ovarian cysts, early reproductive disorders and milk fever. For this analysis, the diagnoses panaritium, mortellaro, sole ulcer and white line disease of Austrian Fleckvieh were considered. The trait claw disorder was defined as a binary trait; whether or not a cow was at least once treated for either of these diseases in the interval of 10 days before to 300 days after calving. In total, 109,239 records of 57,898 cows were available for the years 2007 to 2010. For the genetic analysis, the single trait linear BLUP animal model from the routine genetic evaluation of health traits was applied. The fixed effects parity\*age, year\*month and type of recording\*year as well as the random herd\*year, random genetic animal and the random permanent environmental effects were included in the model. Breeding values were calculated with higher values being desirable as for all traits in the routine genetic evaluation. The frequency of claw disorders was 4.18% in this data set. The estimated heritability was 0.018±0.003. Significant positive breeding value correlations for bulls with a minimum of 20 records were found between claw disorders and functional longevity (0.22), the conformation traits feet and legs score (0.26), hocks (0.17) and pasterns (0.19) and the health traits milk fever (0.20) and ovarian cysts (0.12). As breeders tend to seek advice of veterinarians in severe cases of claw disorders only, further work should focus on the inclusion of claw trimmers' records.