

Improving dairy cow welfare with flexible neck straps while maintaining hygiene

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Stijn Brouwers¹, Michael Simmler², Pascal Savary¹

1. Centre for Proper Housing of Ruminants and Pigs, Federal Food Safety and Veterinary Office (FSVO), Agroscope, Tänikon 1, 8356 Ettenhausen, Switzerland, 2. Digital Production, Agroscope, Tänikon 1, 8356 Ettenhausen, Switzerland

Neck rails, straps, or chains are commonly used in cubicle housing systems for dairy cows to position them within the cubicle in a way that limits bedding soiling by faeces and urine. However, rigid neck rails are associated with animal welfare concerns such as painful collisions, injuries, and atypical behaviours. Flexible neck straps offer a potential alternative, but their positioning relative to cow body size remains unexplored in terms of effectiveness in reducing soiling and their impact on cow behaviour. This study aimed to determine how flexible neck strap positioning affects rising and lying down behaviours, and defecation behaviour in lying cubicles. In a research barn with two pens each housing 20 dairy cows, two experiments were conducted, one with different neck strap heights (105, 120, 135 cm) and one with different distances from the curb (155, 170 cm). Due to variation in the cows body size, this resulted in ratios of neck strap height to withers height (NSH ratio) of 0.65–0.96 and neck strap distance to diagonal body length (NSD ratio) of 0.85–1.11. Atypical rising and lying down behaviours and defecation behaviour were assessed from video and statistically analysed with respect to NSH and NSD ratios. Atypical behaviours were rare, except for sideways head lunging. A higher, less restrictive NSH ratio reduced the odds of cows crawling backwards on their carpal joints during rising (odds ratio and 95% CI: 0.59, 0.43–0.79). However, other atypical behaviours were not affected by the neck strap positioning. Regarding defecation, a higher NSH ratio was associated with increased odds of faeces landing in the cubicle within a 120 s window around a rising event (odds ratio and 95% CI: 2.16, 1.47–3.43). Similarly, the odds of faeces landing in the cubicle increased with higher, less restrictive NSD ratios (odds ratio and 95% CI: 2.44, 1.11–6.07). These results suggest that flexible neck straps can accommodate cows of different sizes without considerably impeding natural movements during rising and lying down. However, the effectiveness of reducing soiling within the cubicle is improved by positioning the neck strap at lower NSH and NSD ratios, providing more restrictive placement relative to cow body size. Flexible neck straps thus represent an effective piece of equipment to position the cow in the cubicle, balancing animal welfare and cubicle hygiene.