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Research Reports
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A free stall reimagined

Open space is an important feature of a lying environment to dairy cattle, as this allows them to more easily lie down and stand up, and to adopt different lying postures. However, more open lying areas make it more difficult to control where cows defecate and urinate. To reduce contamination of lying areas and improve cow cleanliness, many dairy farms use free stalls that index the lying areas with stall partitions and neck rails. This creates a dilemma for dairy farmers, as the very features that help keep the lying area clean reduce cow comfort in the stall. For this reason, researchers at the University of British Columbia Dairy and Education Research Centre have, over the course of many studies, worked to develop solutions that seek to maintain a clean lying area while minimizing behavioural restriction for the cows.

In one recent study at UBC, researchers investigated lying behaviour of 48 dairy cows (eight groups of six) under three different housing conditions: (1) conventional **free stalls**, (2) an **open pack** (created by removing all partitions and neck rails), and (3) **alternative stalls** (a novel housing system composed of hanging partitions; see Figure 1). Using video, lying behaviour (i.e., head position and level of limb extension) and perching behaviour (i.e., standing with just the front feet in the stall) was recorded. Cows were housed under each housing condition for a one-week period, and stall cleanliness was scored as the total stall area that was soiled.

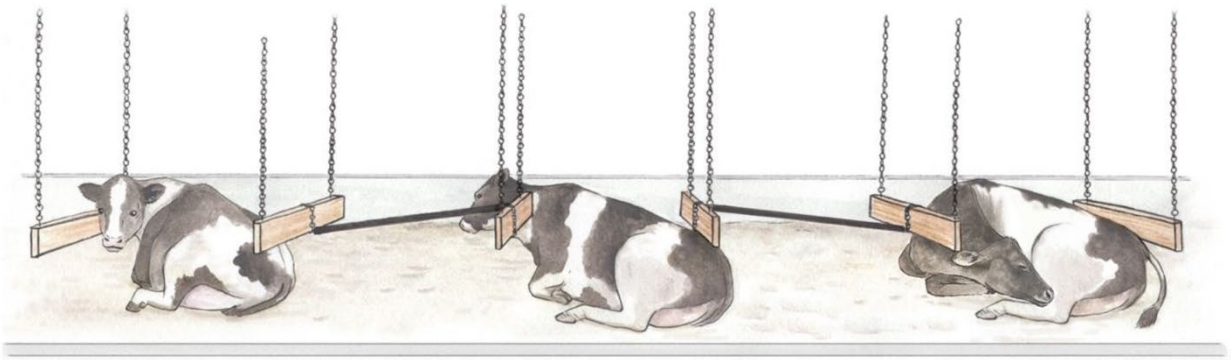

Figure 1. The alternative stalls design used in this study. Drawing by Ann Sanderson.

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Cows spent more time lying down in the two less restrictive housing options (open pack and alternative free stalls) compared to a traditional free stall. Cows in the less restrictive housing options were also found to adopt more extended lying positions, such as lying with hind legs extended and with the neck curled back. In the less restrictive housing, larger cows (≥ 820 kg) showed reduced perching time, likely because these larger cows have difficulties fitting into free stalls. Perching is linked to increased lameness and hoof lesions in dairy cattle. Together, these findings indicate that more open lying areas provide for better cow comfort than a standard free stall, and that the alternative stalls tested in this study provide for a similar level of cow comfort as is provided by an open pack.

Unsurprisingly, traditional free stalls were found to have improved stall cleanliness compared to the open pack and alternative free stalls. However, the alternative free stalls had improved cleanliness over the open pack, suggesting that this novel design could offer improvements to cow comfort while helping to keep stalls clean.

The researchers concluded that an alternative stalls design can provide the cow-comfort benefits of an open pack, but with improvements in stall cleanliness. The alternative design tested in this study was completed as a proof of concept and is not commercially available, but the hope is that this research will help inform the development of new barn designs that improve cow comfort and work well for the farmers who care for them.

For further information please contact Marina (Nina) von Keyserlingk (nina@mail.ubc.ca) or Dan Weary (danweary@mail.ubc.ca). *The results described in this article are based on the publication: Annabelle Beaver, Emma Strazhnik, Marina A.G. von Keyserlingk, Daniel M. Weary. 2021. The freestall reimagined: effects on stall hygiene and space usage in dairy cattle. Animals. 11: 1711. https://doi.org/10.3390/ani11061711*

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Research Reports

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