

# **An investigation into the interaction of bedding application rates and air flows on positional behaviour of beef cattle**

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Lying behaviour in cattle can be used as a sign that an animal is either in a state of rest or sleep and has been used as an indicator of housing qualities when cattle are transported on long-haul live export voyages (MLA 2009). The provision of bedding on livestock vessels is utilised to support the animal to stand, walk and lie easily and comfortably (MLA 2009). Bedding is also used as an absorption agent for animal manure, and with adequate ventilation, the resulting airflow will lift excess liquid and moisture from the pad and keep the bedding dry (MLA 2016). According to the Australian Standards for the Export of Livestock Version 3.0 (2020) cattle and buffalo exported on voyages of ten days or more must be provided with sawdust, rice hulls or similar material to be used exclusively for bedding at a rate of at least seven tonnes or 25m<sup>3</sup> for every 1000 m<sup>2</sup> of cattle pen space. However, this regulation does not apply to cattle and buffalo loaded from Brisbane or from ports north of latitude 26° south and exported to Southeast Asia.

There is little evidence as to the optimal application rates of bedding to cattle pens on-board for animal comfort. To our knowledge, the interaction of airflow in the pen with bedding volume on the time cattle spend standing and lying has not been previously documented. The aim of this experiment is to investigate the frequency and duration of time spent lying and standing in a three by three factorial design of bedding application rates and air flow configurations.

The study will be conducted for a total of 62 days at the University of New England (30.4900° S, 151.6410° E). Thirty-six *Bos indicus* cross steers with initial live weights between 320 kg to 350 kg will be divided into two groups of eighteen (Group A and Group B). Two animals from each group will then be randomly selected and assigned as a pair to one of nine pens for seven days. Each group will be utilised in two out of four replicate runs. Three bedding application rates will be used: commercial sawdust at 0, 13.5 and 27.1 kg to cover 3.97 m<sup>2</sup> area in each chamber. Air flow into the chambers will be set at flow rates of either 7, 12, 18 m<sup>3</sup>/min. Bedding and manure samples will be collected daily for dry matter analysis. Pad temperature and humidity will be recorded on day seven. Commercial shipper pellets (8.0 megajoules of metabolisable energy/kg dry matter, 12.2% crude protein) will be provided twice a day (morning and afternoon) at two percent of live weight.

Cattle will be continuously monitored using a video recorded surveillance system and the proportion of each 24-hour period spent lying down in lateral or sternal recumbency or in a standing position will be analysed using fifteen-minute scan samples of this footage.

Our hypothesis is that the combination of providing more bedding with higher air flow rates will provide an environment in which cattle will lie down more frequently for longer bouts of time and for a longer total time.

*Results to be prepared and will be presented at the conference.*

## **References**

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