26th July 2024

To the members of the NSW Committee on Investment, Industry and Regional Development,

Thank you for the opportunity to provide a response to the Committee's supplementary questions relating to the Prevention of Cruelty to Animals (Virtual Stock Fencing) Bill 2024. Please find my response to these questions below.

1. **At the public hearing, the Committee heard from several witnesses about the potential savings of farmers using virtual stock fencing. Can you provide any data on the economic advantages of virtual stock fencing, in terms of labour and materials costs?**

   I am not aware of a comprehensive economic analysis of virtual fencing based on recent technologies or on the benefits achieved in commercial farm settings. One Australian modelling study, which was based on assumptions of the dairy farming system and the benefits achieved by virtual fencing, found an improved value proposition when the technology more than pure labour savings (Cullen and Armstrong, 2022). TIA is currently conducting research under commercial farm conditions to measure how the adoption of virtual fencing influences animal productivity and health, as well as pasture production and consumption.

   Anecdotally, dairy farmers in Tasmania report that the virtual fencing technology helps attract a new and younger generation of staff, and that their time saved enables training and upskilling of existing staff. They report a more content workforce and greater staff retention. These benefits extend beyond simple labour costs but are harder to capture with quantitative data.

2. **Many stakeholders consider the animal welfare risks of virtual stock fencing comparable to traditional electric fencing. Is this a fair comparison?**

   Current scientific evidence suggests that the welfare of dairy and beef cattle managed in virtual fence systems is comparable to those managed in conventional electric fence systems. Welfare assessments generally include measures to detect activation of the physiological stress response (e.g., concentration of cortisol in milk, faeces, hair) and consequences of changes this (e.g., changes in body weight or other productivity measures and behaviour).

Research to date has studied welfare up to 8-weeks post-training to the virtual fencing technology. Long-term studies on the welfare implications of virtual-fencing systems are required (i.e., months or years). Research has also focussed on relatively simple grazing systems characterised by a single virtual fence that remains in a fixed location while cows are in the paddock. The welfare of cattle under more complex grazing regimes (e.g., a front and back-fence) and with a virtual-fence that can move (e.g., to provide access to fresh pasture) needs assessment.

3. **How do the age and experience of stock animals affect their ability to adapt to virtual fencing technology?**

   TIA research suggests that dairy cattle learn the association between audio and electrical stimuli more quickly if they have previous experience with electric fencing (Verdon et al., 2020) and are trained at an age close to calving compared to a younger age (i.e., ≤ 12-months; Verdon and Rawnsley, 2020). These studies were conducted using manually operated dog training collars to prevent individual cattle from reaching a feed source in a purpose-built test arena. We are currently exploring relationships between cow parity and response to the virtual fencing technology in large groups of animals managed in applied conditions.

Yours sincerely,

Dr. Megan Verdon

Senior Research Fellow
Leader of Animal Welfare and Production
University of Tasmania