1. ***At the hearing, you discussed the potential savings of farmers using virtual stock fencing (uncorrected transcript, page 35). Can you provide any further data on the economic advantages of virtual stock fencing, in terms of labour and materials costs?***

Virtual fencing and herding technologies are still a relatively recent addition to the suite of available precision livestock farming technologies. Therefore, to my knowledge, there are no peer-reviewed, published economic analyses outlining the cost-benefit of the application of these systems in an Australian dairy farming context. The Tasmanian Institute of Agriculture, an organisation which also submitted to, and gave evidence at, the inquiry has recently commenced an economic analysis looking at virtual fencing and herding in dairy systems. This will be a useful study to refer to once completed.

With that caveat in mind, to help provide an estimated response to your question, the following points build on the example situation discussed during the inquiry, using a 400-cow dairy farm. The cost of virtual fencing/herding system is assumed to be $8.50 per cow per month, which was used several times during the inquiry, though the price of technologies varies between manufacturer, and manufacturers may also utilise a subscription model with different tiers of pricing.

Assumptions/calculations:

- **Cost of fencing/herding:**
    - 400 cows @ $8.50/cow/month =
        - $40,000 annual cost for a 400-cow farm

- **Labour savings:**
    - Annual labour costs have been calculated using the Flat Pay Rate Calculator for an employee classified as an FLH8 (Farm and Livestock Hand Level 8) on the Pastoral Award 2020 (Pay rates | The People in Dairy). At a minimum hourly rate of $29.19 (as of 1 July 2024), a staff member working a 50-hour work week, which is commonplace in dairy, total annual wages are calculated as $86,887. With the commonly accepted addition of 20% on-costs including superannuation, insurance and other costs this goes up to $104,264. This is an underestimate, as in reality most farms are paying above award rates to attract and retain staff.
    - ~3 hours per day in mustering cows from and returning to paddocks twice daily for milking = 21 hours per week
    - ~1 hour per day in setting temporary fencing for strip-grazing = 7 hours per week
    - This totals to ~28 hours per week, and using the assumption above, that the employee works a 50-hour week, this would result in the following reduction in labour requirement:
        - 0.56 FTE x $104,264 = $58,388 labour savings per year

    - **<u>Net saving = $58,388 - $40,000 = $18,388 per year (46% return on investment)</u>**

- **Materials costs for physical fencing**
    - Most dairies which would be likely to uptake virtual fencing are likely to have existing physical fencing in place for paddocks and would use temporary electric fencing reels for establishing temporary fences for strip-grazing.
    - Therefore, I have not included, in this example, the establishment of new permanent fencing, a cost which is going to vary significantly depending on the situation, making it difficult to estimate. There would be, on some farms, some significant potential savings in not having to maintain or replace old physical fencing, or erect new physical fencing in greenfield dairy farms. This is situation-specific, and therefore an estimate is not included here.
    - With respect to temporary fencing, the cost of this equipment is relatively small in relation to the example (~$200 for a grazing reel, ~$10 per 'pig-tail' temporary fence-post), so I have left them out for simplicity, but there would be some small savings to attribute to virtual fencing here.

- **Other savings:**
    - Another saving would be via the reduction of fuel and maintenance costs for quadbikes and side-by-side vehicles. The use of these vehicles would be reduced in proportion to the number of hours less mustering which the farm has to do each week – approximately 21 hours in this example, over 10,000 hours less per year.
    - Again, the cost of this is hard to estimate precisely as it would vary by vehicle type, track length, farm topography etc. but this would be a significant annual saving in fuel and maintenance costs, in addition to significant reduction in emissions associated with these vehicles.

In summary, there is a direct economic benefit (in this example, of $18,388 per year or 46% return on investment), purely from the labour savings acquired from eliminating the need for daily mustering and setting up strip-grazing. Some farm businesses my choose not to realise these labour savings directly, and rather reallocate those labour units to higher value, more strategic and more rewarding tasks on the farm. In the case of owner-operator enterprises, they may utilise this additional time in their week to improve work-life balance and mental wellbeing.

The above is a demonstration of the value of virtual fencing/herding technologies to farmers, based on labour-saving in isolation. This is without considering additional benefits conferred by these technologies, which due to complexity and lack of published data, I have not discussed in this example. These benefits include, but are

not limited to workplace health and safety improvements, optimal pasture utilisation, animal health and welfare monitoring, environmental and wildlife protections, biosecurity and traceability benefits, and emergency management during floods and fires.

Please let me know if you would like any further clarifications on the above points.